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AIM: *SLS* is intended as a forum for the presentation of the latest original research by the faculty and especially students of the Department of Linguistics, University of Illinois, Urbana-Champaign. Especially invited papers by scholars not associated with the University of Illinois will also be included.

SPECIAL ISSUES: Since its inception *SLS* has devoted one issue each year to restricted, specialized topics. A complete list of such special issues is given on the back cover. The following special issue is under preparation: *Linguistic Studies in Memory of Theodore M. Lightner,* edited by Michael J. Kenstowicz and Charles W. Kisseberth.

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This special issue of

Studies in the Linguistic Sciences

is dedicated to

BRAJ B. KACHRU

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Molakisi monene mpe mokambisi wa lokumu

TABLE OF CONTENTS

PREFACE

Since the appearance of the first issue of <u>Studies in the Linguistic Sciences</u> devoted to African Linguistics (Vol. 6, No. 2, 1976) edited by Charles W. Kisseberth and myself, the Program in African Linguistics in the Department of Linguistics at the University of Illinois has experienced a significant growth in all areas. In 1976, for example, the Department had only a handful of students specializing in African Linguistics; today there are over twelve graduate students specializing in different areas of linguistics: phonology, sociolinguistics, syntax, and historical linguistics. This increased interest is a reflection of and parallels the expanded research interest of the faculty. While in 1976 there were only two faculty members with research interests on African languages (Bokamba and Kisseberth), today there are five: E.G. Bokamba (Bantu syntax, sociolinguistics, and general African linguistics), C.C. Cheng (Phonology/tonology), B.B. Kachru (sociolinguistics), M.J. Kenstowicz (phonology), and C.W. Kisseberth (phonology/tonology, general African linguistics). Visiting Africanist faculty members provide additional strength to the program from time to time.

This expansion in the regular faculty research interest has made it possible for the Department to offer a diversified program in African linguistics and thereby to attract a variety of graduate students. Since 1976, for example, the Department has granted over ten doctorates to specialists in African linguistics, most of whom are teaching at universities throughout the world. In 1979 the Department, in collaboration with the African Studies Center, hosted the 10th Annual Conference on African Linguistics to mark both the tenth anniversary of the establishment of this professional gathering and that of the program in African Linguistics.

The collection of papers included in this issue is an example of the continuing research interest that has developed in the last eight years or so. The papers represent a broad spectrum in the field: four papers on phonology (Faraclas, Stahlke, Steinbergs, Vine), three on syntax (Clements, Obeidat, Yanco), and three on sociolinguistics (Bokamba, Creider, Yokwe). Five of the ten papers are by current and former faculty (Bokamba and Stahlke) and students (Obeidat, Steinbergs, Yokwe) of this Department. The collection includes three papers selected from the 10th Annual Conference on African Linguistics (Clements, Stahlke, Vine). More papers from that conference could have been included, but we were not able to contact several authors in time for this publication.

The program in African Linguistics at Illinois began with the teaching of Swahili by Chin-W. Kim in 1968. But the progress described above would not have been possible without Braj B. Kachru's vision and unwavering support throughout the period of his tenure of office as head of the Department of Linguistics (1969-79). It was decided at the 10th Annual Confrence on African Linguistics in 1979 that the proceedings of the conference would be dedicated to him. Although this collection does not include many of the papers presented then, we would still like to think of it as representing the "spirit" of the proceedings of that conference. It is with great pleasure that we dedicate this issue to Braj as an expression of our appreciation for his scholarship, teaching, and leadership.

Eyamba G. Bokamba

Urbana, IL
May, 1985

FRENCH COLONIAL LANGUAGE POLICY IN AFRICA AND ITS LEGACIES (PART I)*

Eyamba G. Bokamba

This paper discusses the impact of the French colonial lan-
guage policy on education and its legacies in the former French
colonies, with particular emphasis on Western Africa. It shows
that French language policy was culturally, politically, and
economically motivated. The paper argues that in spite of the
well-articulated colonialist objectives of this policy, inde-
pendent Francophone African states have maintained its status
quo. As a result, little effort has been made to modernize
and promote indigenous African languages to serve national
functions. The lack of African-based language policies vis-à-vis
education has contributed to poor academic outputs and continu-
ing high illiteracy rates in the region. To remedy this situa-
tion, it is suggested that Francophone African states reevaluate
their inherited language policy and adopt new policies that will
respond better to national developmental objectives.

1.0 Introduction

Much of the published research on language policy and language planning
(hereafter LP & LP) in Africa in the past two decades has focused on the
historical development aspects and on the necessity for adopting African
language-based policies that are consistent with nationalism, educational
objectives, and socio-economic development (cf Bokamba and Tlou 1977, Ansre
1976, 1978, Andrzejewski 1980b)[1]. Little attention, however, has been paid
to the examination of the question of the impact of African language policies
on formal education, literacy, and language development (cf. Bokamba 1981,
1984). A discussion of this question is crucial to our understanding of
recent developments in education and language policies in the continent
particularly in countries such as Ethiopia, Somalia, Tanzania, Zaire,
Madagascar, Nigeria, Senegal. Furthermore the articulation of comprehensive
and objective language policies for the future progress and educational
planning of Africa is vital. The insight gained from such an examination
would undoubtedly contribute to a better formulation of LP and LP theory.

1.1 Objectives and scope of study. The purpose of this study is to
examine the impact of the French colonial language policy on education and
its legacies in Francophone regions of Africa, particularly Western Africa.
The paper surveys briefly the evolution of the French colonial language
policy from 1826 to 1959, and examines its effect on three specific areas of
language and education in the region: formal education, literacy education,
and African language development or modernization.

In the course of the discussion it is shown that Francophone Western
(i.e., former French colonies in Central, West, and Northern) Africa has

negatively distinguished itself in three ways: First, it has the highest average illiteracy rate of any comparable region in the continent. Second, its school drop-out and class-repeater rates are the highest in the continent (cf. Unesco 1977, Barnes 1982). And third, its lingua franca are among the least developed in Africa.

Drawing on comparative data from other regions in the continent, an attempt is made to ascertain the causes of these problems. It is concluded that while rampant illiteracy and academic inefficiency are common phenomena in Africa, the particular difficulties in education and language development experienced by Francophone Western Africa are largely attributable to the French colonial language policy and its legacies in education. The paper concludes with a discussion of the implications of these findings for LP and LP. We begin with an overview of the literature on French colonial language policy.

1.2 <u>Overview of the literature</u>. Since the beginning of the 1960s there have been a number of studies devoted in part or entirely to French colonial language policy in Africa. Some of these studies have described the French language policy as being motivated by socio-political considerations whereby Africans were subjected to a policy of cultural assimilation through language and education for the purpose of rapid power consolidation (cf. Crowder 1967, Spencer 1971, Awoniyi 1976, Sylla 1978). Others have characterized it as an instance of linguistic imperialism and ethnocentrism (Calvet 1974); while still others have viewed it as the result of perceived mutual socio-economic interests between the colonizers and colonized (Alexandre 1963, Turcotte 1981).

More specifically, Alexandre (1963: 53-54) states that the imposition of French as the sole language of administration and education in colonial Francophone Africa was simply an extension of French monolingual policy adopted in the 16th century; and that its continuation to the detriment of African languages in the 1950s was due in part to the expressed wishes of African intellectuals to use French as the medium of instruction in a French-based system.[2]

Over-all, the picture that emerges from the literature is that French colonial language policy in Africa was dictated by (a) politico-cultural considerations; (b) African intellectuals' desire to benefit from the same educational system as that offered in France; and (c) various local linguistic factors. The first factor has generally been interpreted in the literature as being *la force motrice* (cf. Spencer 1971, Calvet 1974, Bokamba and Tlou 1977). How accurate is this view? Were there other factors that motivated French language policy in Africa? To answer these questions we need to review the evolution of the French colonial language policy, giving particular emphasis on the key documents and socio-political factors that shaped it.

2.0 French Colonial Language Policy

The French colonial empire extended through much of Northern and Western Africa, and comprised the twenty countries listed in Table 1 below. These nations, most of which acceded to political independence at the beginning of the 1960s, had an estimated total population of about 65,075,000 in

1960.

Table 1: French Colonies and Protectorates in Africa*

Country	Independence date	Estimated 1960 population
Affars & Issas (now Djibouti)	27 June, 1977	N.A.
Algeria	3 July, 1962	10,784,000
Central African Republic	13 August, 1960	1,210,000
Chad	11 August, 1960	2,660,000
Dahomey (now Benin)	1 August, 1960	1,934,000
French Cameroon	1 October, 1961	4,097,000 [3]
French Congo (People's Rep. of Congo)	15 August, 1960	900,000
French Guinea	2 October, 1958	3,000,000
French Sudan (Mali)	22 September, 1960	4,100,000
Gabon	17 August, 1960	440,000
Ivory Coast	7 August, 1960	3,230,000
Madagascar	26 June, 1960	5,393,000
Mauritania	28 November, 1960	---
Mauritius	12 March, 1968	656,000
Morocco	2 March, 1956	11,626,000
Niger	3 August, 1960	2,823,000
Senegal	20 August, 1960	2,973,000
Togo	27 April, 1960	1,440,000
Tunisia	20 March, 1960	4,168,000
Upper Volta (now Burkina Faso)	5 August, 1960	3,635,000

*Source (of population estimates): UNESCO Statistical Yearbook, 1964

The French colonial language policy in these countries evolved through a
series of decrees, ordinances, official memoranda/communiqués, and practical
decisions made by colonial administrators in the colonies.

2.1. Implementation of the language policy. The most important piece
of legislation that *shaped* the evolution of the French colonial language
policy in Africa was the metropolitan ordinance of Villers-Cotteret which
was issued in 1539 by King Francois I. This ordinance made French the ex-
clusive official language of the French Kingdom, thus disallowing the use of
Breton, Basque, Flemisch, Occita, German, Provencal, etc., in official func-
tions (Alexandre 1963: 53). In 1634 Cardinal Richelieu established the
French Academy to regulate the language (Alexandre 1963: 54), thus enhancing
its authority and prestige.

The ordinance of Villers-Cotterêt was extended to all French colonies
when France became a major colonial power in the 19th century. The evidence
for the evolution of this policy in Africa has been ably compiled by Denis
Turcotte (1981b) in his Repertoire Chronologique de la Politique Linguisti-
que en Afrique Francophone. According to Turcotte, the first documented
evidence of the extension of the ordinance of Villers-Cotterêt to Franco-
phone Africa appeared in 1826. On July 14 of that year, decree No. 14
authorizing the establishment of a girls' school in Saint-Louis, Senegal,
stipulated in its article 8 that (Turcotte 1981b: 28):

(1) La langue française sera seule employée par les élèves.

On October 18, 1848, decree No. 95 of the director of administrative services in the colonies referring to local elections stated in its article 9 that because of the insufficient number of Arabic interpreters to be provided for the election pricincts, all the election materials would have to be written in French (cf. Turcotte 1981b: 31).

The success of the Koranic schools, which were taught in Arabic, and the schools' unwillingness to teach French as a subject became a matter of concern to the colonial authorities. To curb the Moslem community's influence and force it to comply with the colonial language policy, ordinance No. 96 regulating "Moslem schools" was issued on June 22, 1857. Article 5 required all teachers to take or send all pupils aged 12 and above to evening French classes at the government or Catholic church schools (Turcotte 1981b: 31):

> (2) Les maîtres d'école musulmanes seront obligés de conduire ou
> d'envoyer, tous les jours, à la classe du soir (soit celle de l'école
> laïque, soit celle des frères) tous les élèves de 12 ans et au dessus.

After ordinance No. 96 failed to achieve the desired results, the French colonial administration issued a stronger and more comprehensive ordinance on February 28, 1870, consisting of eleven articles. This ordinance made knowledge of French not only a requirment for pupils and teachers in Moslem schools, but also a prerequisite for the establishment and continuation of such schools. Students and teachers were required to demonstrate proficiency in French after a period of two years; failure to do so led to the dismissal of the student from the Koranic schools and to his subsequent enrollment in a government or Catholic mission school (Turcotte 1981b: 37-38). Schools which failed to provide instruction in French after the grace period lost their licence to operate. Monetary and non-monetary incentives were given to schools whose students received the best results on the yearly competitive examination in French.

In short, the primary objective of ordinance No. 85 of February 28, 1870, was to force the Koranic schools, which were until 1857 the only ones allowed to teach in a language other than French, to serve as an agent for the spread of French in colonial Francophone Africa. The ultimate goal of the colonial administration was to completerly absorb the Koranic schools into the French educational system and thereby eliminate them. These schools could not have been outlawed directly, because such an action would have been construed as a violation of the philosophical tenets of the French Revolution.

The most interesting part of ordinance No. 85 is the preamble where the French colonial administration's politics of assimilation emerges clearly. We quote this passage in its entirety, along with the first article, because of its implications on future LP and LP activities in the region (Turcotte 1981b: 37-38):

> (3) Nous, Gouverneur du Senegal et dependences,
>   Vue l'arreté du 22 juin 1857 sur les écoles musulmanes;
>   Considerant que le but de l'administration de la colonie,
>   en regularisant par ledit arreté l'institution des écoles
>   musulmanes, a été de *chercher à s'ssimiler les enfants indigènes;*

Que ce but n'a pas été atteint jusqu'ici, par suite de
l'indifférence apportée par les maîtres d'écoles:
*Attendu que le moyen le plus efficace d'arriver à ce resultat
paraît être d'exiger desormais que ces maîtres habituent les
enfants à comprendre et à parler la langue française;*
Attendu qu'il convient, dans ce but d'astreindre à certaines
conditions les individus qui demanderont à tenir des écoles
arabes:
Sur la proposition du directeur de l'intérieur,
Le conseil d'administration entendu,
Avons arreté et arretons:

Article 1er. Nul ne pourra, à l'avenir, obtenir l'autorisation
de tenir une école musulmane si, en conformité de la prescription
de l'arreté du 22 juin 1857 precitée, il n'habite Saint-Louis
depuis sept années, et s'il ne produit un certificat de bonne
vie et moeurs du maire de la ville, *et ne justifie savoir parler
le français devant un jury d'examen composé*
du chef du 2e bureau de la direction de l'interieur,
du maire de la ville,
et du cadi, chef de la religion musulmane.
L'autorisation sera retirée si le titulaire en devient indigne.
(Emphasis added.)

After the imposition of this ordinance on the Moslem schools, the community pro-
tested in vain only to be told firmly by the colonial administration that
the exceptional status they enjoyed previously with regard to the language
policy was actually "an abuse" of the law, and must be terminated immediate-
ly. The Moslem community leaders recognized that ordinance 85 and its pre-
decessor were aimed at curbing not only their influence in education, but
also at coercing them to become agents of the spread of French and its cult-
ure. The ultimate goal of the French adinistration was to force the Islamic
community out of general education, and thereby confine it to religious
education.

Although ordinance No. 85 was specifically issued to regulate the oper-
ation of Koranic schools, its broader intent was to secure complete control
of general education for the colonial administration. This exercise in
power consolidation was motivated by three important factors in French colo-
nial politics. First, the French government in the 1800s espoused the view
that the education of the people, whether colonized or free citizens, was
the responsibility of the government, not of any private organization (cf.
Bokamba 1984). Second, the French considered the church to be the "enemy of
reason, the stronghold of conservatism and an obstacle to development and
progress" (Awoniyi 1976: 32). In view of this, the French colonial adminis-
tration in Africa could not entrust the education of the African children
with any religious organization nor allow any competition against the state
in this area.

Third, and most importantly for our purpose here, the French colonial
administration in Africa viewed education as *the most effective tool* for
colonizing the Africans, and made a serious though selective effort to ex-
tend it to the target population (Bolibaugh 1972: 5). The Governor-General
of the French West African colonies (i.e., *l'Afrique Occidentale Française,*

A.O.F.), Mr. E. Chaudié, stated this point eloquently and forcefully in his circular letter of June 22, 1897, addressed to his territorial administrators and commanders. He stated in paragraphs four and five of this letter that (Turcotte 1981b: 51):

(4) *L'école est, en effet, le moyen d'action le plus sûr qu'une nation civilisatrice ait d'acquérir à ses idées les populations encore primitives et de les élever graduellement jusqu'à elle. L'école est, en un mot, l'élément de progrès par excellence. C'est aussi l'élément de propagande de la cause et de la langue françaises le plus certain dont le Gouvernment puisse disposer.* Ce ne sont pas, en effet, les vieillards imbus des préjugés anciens, ce ne pas même les hommes faits, pliés déjà à d'autres coûtumes, que nous pouvons espérer convertir à nos principes de morale, à nos règles de droit, à nos usages nationaux. *Pour accomplir avec succès cette oeuvre de transformation, c'est aux jeunes qu'il faut s'adresser, c'est l'esprit de la jeunesse qu'il faut penetrer et c'est par l'école seule, que nous y arriverons.*

C'est vous dire, Monsieur l'Administrateur, *quelle importance j'attache au developpement de l'instruction publique, à la diffusion de la langue et des idées françaises et au bon fonctionnement des écoles.* (Emphasis added.)

Governor Chaudié's statement is an eloquent illustration of the French assimilationist philosophy which became a dominant influence in French Africa.[4] It is evident from the above passages that education for the colonized people was not *an end* in itself, but rather *a means* through which acculturation and servitude were to be achieved. In this regard, the French language was seen not only as the vehicle par excellence for the spread of French culture, but also as the ultimate beneficiary of thousands, and eventually millions, of new speakers.

We shall not elaborate on this point here. Suffice it to say that a series of executive decrees, reinforced by regular official memoranda, were issued to promote the use of French in all administrative and educational functions, on the one hand, and to proscribe the use of African languages in such functions, on the other hand, throughout the colonial period (Stumpf 1979, Turcotte 1981b). These regulations were further backed up by various monetary and non-monetary rewards to schools, students and functionaries who demonstrated proficiency in French and its culture. No such inducements were provided for proficiency in African languages, except that regional administrators were encouraged to familiarize themselves with the major languages of their subjects for administrative efficiency.

The use of African languages in education and administration was actively discouraged by the French colonial administration, because African languages were viewed as an obstacle to the objectives of cultural assimilation in French. Specifically, these languages were seen as perpetuating racial and cultural differences between the colonized and colonizers. It is for this reason that Governor-General Chaudié's statement cited in (4) above emphasized the transformation of the African youths through education, rather than that of the old people ("vieillards") whom he considered to be "imbued with old prejudices" and "bent to other customs" and values. French colonial

administration wanted to erase these differences through its policy of
assimilation. African languages had, therefore, to be prohibited from play-
ing any instrumental role in education and administration.

Governor-General W. Ponty, Chaudié's successor, pursued the same stra-
tegy of using education as an agent of the spread of French and its culture.
In a lengthy circular No. 82c, dated August 30, 1910, Governor Ponty insist-
ed on the importance of the policy of assimilation (cf. Turcotte 1981b: 73),
and emphasized the wisdom of pursuing it through formal education (Turcotte
1981b: 74):

(5) *L'école est le meilleur instrument du progrès; c'est elle qui sert
le mieux les interêts de la cause française et qui en transformant
peu à peu la mentalité de nos sujets nous permettra de les acqué-
rir à nos idées sans heurter aucune de leurs traditions.* Nul n'
ignore en effet que l'étude du français est le remède le plus
efficace qui puisse être opposé au fanatisme et l'experience nous
apprend que *les musulmans qui connaissent notre langue sont moins
imbus de préjugés que leurs coreligionnaires qui ne savent que
l'arabe.*

Governor Ponty instructed his administrators to multiply the number of state
schools in all regions, especially in the rural communities, so as to pre-
empt and/or reduce the expansion of the Koranic schools.

2.2 **Language and assimilation policy.** The French colonial administra-
tion's policy of assimilation raises questions of motives. Why did the
French government assume exclusive responsibility for the education of its
African subjects, instead of sharing it with or delegating it to private and
religious organizations as other major colonial powers (i.e., Belgium,
Britain, and Portugal) in the continent did? Why did the French colonial
administration espouse the policy of assimilation, instead of an evolution-
ary or *laissez faire* one as practiced by their Belgian and British counter-
parts?

The French colonial politics and policies in the region were guided by
three major factors: cultural imperialism or ethnocentricism, economic con-
siderations, and military resources (Morgenthau 1964, Calvet 1974, Turcotte
1981a, b, Lokulutu 1982). The third factor, which is not immediately relevant
to this study and will not be discussed further, was particularly applicable in
the period from World War I to World War II (1918-45).

The French, it is commonly acknowledged in the political literature,
believed that they had a civilizing mission to carry out in Africa (cf.
Morgentahu 1964, Crowder 1967, Lokulutu 1982). They felt that their civil-
ization was superior to that of the Africans, and that the best way to bring
them to par was through an active policy of political and cultural assimil-
ation. Education *à la française,* initially aimed at the sons of chiefs and
subsequently extended to a highly selected youth population, was *the* medium
through which the policy was implemented, as evidenced in the passages in
(4) and (5) above. Viewed from the humanitarian principles of *égalité,*
fraternite, et justice for all irrespective of race and creed advocated by
the French Revolution, the assimilation policy was seen as the best approach
to erase the cultural and attitudinal differences that existed between the

colonized and colonizers so as to develop a common culture--the French way of life (Mumford 1935, Crowder 1967). The ultimate goal, as observed earlier, was to facilitate the submission of the African people to French colonization - both culturely and politically.

Whether the policy of assimilation was generally considered by the French government to be a success, remains to be determined.[5] The evidence that has emerged in the past twenty-four years, i.e., since the advent of political independence of most of the states in the region, suggests stringly, however, that assimilation was partly a failure and partly a success. It was a failure to the extent that it did not transform the former colonies into an overseas France and its people into overseas Frenchmen. The differences between the former colonized people and the colonizers remained largely unchanged. As Morgenthau (1964: xxi) aptly observes with regard to West Africa:ʿ

(6) When the obvious ties of colonialism were broken one goal of the first generation of French-speaking West African party leaders was achieved. But only one. Independence changed the political rulers. *It did not wipe out the differences--economic, cultural and political--between the rulers and the ruled.* After independence, to meet the expectations of the mass of the people and provide occasions for further social mobility, economic development became the order of the day. *It was the goal of the generation which aspired to the succession.* (Emphasis added.)

Economic development and independence have proven to be difficult goals to reach for most of the former French colonies in Africa. One factor that accounts for this situation is that the economic structures of the colonies were integrated into, or rather, made dependent upon, the French (metropolitan) economic structure (Ake 1982, Lokulutu 1982). This brings us to the second factor that motivated French colonial policies in Western Africa.

While cultural imperialism and military considerations were undeniably important in the conduct of French colonial politics, the most important factor which guided not only the conduct of that politics but also motivated the colonization of the region was *economic*. Governor-General W. Ponty, in his letter of August 30, 1910, cited in part in (5) above, notes the importance of the French educational policy to this aspect of colonization. He states (cf. Turcotte 1981b: 74):

(7) Même si on n'envisage que le point de vue commercial de notre colonisation, il faut reconnaitre que l'instruction sert les interêts de la Métropole plutôt que de leur nuire. Ainsi que je l'ai dit, *l'instruction en transformant le goût de nos sujets augmente aussi leurs appetits, c'est-à-dire leur puissance de consomation et les oblige à travailler.* En créant des écoles *nous contribuerons donc à l'accroissement de la rechesse dans le pays et nous obtiendrons des indigènes une collaboration d'autant plus active que mieux renseignés sur nos intentions à leur égard (et) ils auront une confiance plus marquée dans notre autorité et deviendront moins dociles aux suggestions interessées des marabouts ignorants ou fanatiques.*

*Il me paraît d'ailleurs inutile d'insister encore une fois sur les
avantages de tout ordre que nous pouvons avoir à recruter sur
place les fonctionnaires nécessaires à notre Administration ou les
ouvriers indispensables au développement de notre outillage économi-
que.* (Emphasis added.)

It is evident from these statements that French colonial policy of
assimilation through education was motivated by ultimate economic concerns.
The twenty African countries identified in Table 1 above represented a size-
able market not only for French manufactured goods, but also a significant
source of cheap raw materials and cheap labor force. As long as this was
the case, the logic of their educational and language policy is perfectly
defensible: They had specific economic objectives and devised the most
appropriate policy to achieve them.

Considered from the point of view of economic integration whereby a
dependency relationship was created between the so-called metropole and the
colonies, the policy of assimilation was a great success. As in other colo-
nies in the continent, French colonies provided cheap labor and the raw
materials (e.g., agricultural, mineral and oil) that made the French economy
prosper. The economic infrastructure developed in the colonies was oriented
towards the export of raw materials to France and other Western European
countries. As in most other African colonies, virtually no industries were
set up in the French colonies prior to the end of World War II, and the few
that were established between 1945 and 1959 were mainly extractive. Manu-
facturing industries were located, instead, in France.

As a result of this economic structural relationship, France and the
world market dictated not only what to produce in virtually all sectors, but
also determined the prices to be paid for the commodities exported (Ake
1982). This economic 'assimilation' worked so well during the colonial
period that the leaders of pre-independence Francophone Africa saw no need
to change it. In fact, they approved, with the exception of Guinea (former-
ly French Sudan),[6] the formation of a French economic community and a common
monetary zone under the French franc. On February 9, 1959, the eve of poli-
tical independence for most of the twenty countries, this relationship was
sealed by the adoption of French as the sole official language of the French
Community (Turcotte 1981b: 131):

(8) Article unique. *La langue officielle de la Communauté (française)
est la langue française.*

With a few exceptions (see sections 2.3 and 3.0 below), French has remained
the sole official language of administration and education in Francophone
Africa today.

2.3 <u>Language Policy Legacies and their Raison d'être</u>. As has been
shown, the use of African languages in the education of Africans was pro-
scribed initially by the extension of the ordinance of Villers-Cotterêt of
1539, and subsequently by a series of colonial executive decrees. Up to
1910 the decrees prohibiting the use of African languages were largely
implicit in their mention of these languages, but this situation changed
from 1911 onwards when several such decrees were issued to enforce the es-
tablished language policy. The first decree of this type appears to be

No. 1207 issued on October 1911, in connection with the founding of materni-
ty schools in Senegal. Article 4, line 4 stipulated (Turcotte 1981b: 80):

(9) L'emploi des idiomes locaux est rigoureusement evité.[7]

The enforcement of this policy was so strict that the printing or publica-
tion of books in African languages for use in the so-called "village
schools" was subjected to a 12.8% tax (Stumpf 1979: 82). Imported books in
other languages (e.g., German, English) were levied the same amount of tax
by the custom service. Mission schools were allowed to use indigenous lan-
guages, but their educational functions were viewed by the French as strictly
religious. The ordinance of February 14, 1922, spelled this out (Spencer
1971: 543):

(10) General education must be carried in French.....The Coranic
schools and catechist schools are authorized to provide exclusive-
ly a religious education in the vernaculars. Such schools are not
considered as institutions of public education.

The continuation of this language policy after World War II raised
questions in the minds of some liberal French parliamentarians, especially
in light of the establishment of the French Union or Community, consisting
of France and its colonies, and the *de jure* recognition of the equality of
all the people in the Community. Following the Brazzaville Conference of
January 1944, the French Constitution of October 27, 1946, which governed
the new Community, recognized the equality of the cultures of the member
countries and advocated the establishment of a democratic system within the
Community (cf. Morgenthau 1964, Lokulutu 1982). This spirit of equality
and democracy is evidenced in the preamble to the Constitution (Lokulutu
1982: 276):

(11) France forms with the people of overseas a union established on
*the equality of duties and rights, without racial or religious
distinction.* The French Union is composed of nations and peoples
who put in common and coordinate their respective civilizations
to increase their well-being and guarantee their safety. *Faithful
to her traditional mission, France intends to lead the peoples she
has taken in charge to self-administration and democratic manage-
ment of their affairs. Setting aside all systems of colonization
founded on arbitrary powers, France guarantees to all equal access
to public functions and to individual and collective exercise of
the rights and liberties proclaimed herein.* (Emphasis added.)

Whether this declaration had any substance remains a debatable question.
Evidence from other parts of the 1946 Constitution and France's behavior
from this period onwards indicate clearly that she had no intention of treat-
ing other members of the Community as equal partners. She planned to remain
not only the colonial power, but also the dominant political, cultural, and
economic power in the Community. The French education system was to serve
as the model for the educational systems of the colonies (both in Africa
and elsewhere), and the language policy established before the Brazzaville
conference was to remain in force throughout the colonial period. Access to
public functions or positions, especially in higher administrative posts,
and job upward mobility were determined by one's education and competency in

French: the more one's education mirrored that provided in France, the greater his chances for obtaining good employment and a commensurate salary. In a word, one's degree of success as an educated person depended on the extent to which he or she assimilated to the French education and culture (Morgenthau 1964, Crowder 1967).

Alexandre (1963: 54) reports on an event that occurred in the French parliament at this time which he claims contributed to the retention of French as the sole medium of instruction in the African colonies. According to this source, some French nationals brought up for discussion the question of the use of African languages in African education, with a view to changing the existing language policy. The change was strongly resisted by the African representatives in the parliament on the grounds that it would create two unequal systems of education, one for Africans and the other for French, and thereby deny the former an equal opportunity to *a French education* (Alexandre 1963: 54). Moreover, they viewed the attempt to introduce the use of African languages as media of education as a ploy to keep their children backward. Alexandre (1963: 54) goes on to observe that not only did the African representatives, except for Senghor, demand the extension of the use of French throughout the schools in the countries concerned, but also that language courses in Ewe offered under U.N. pressure in Togo were taken only by foreigners. An attempt by "African intellectuals" in Paris in the 1950s to find a solution to the question of the proper place for African languages and French in African education met with all sorts of obstacles. As a result, Alexandre (1963: 55-59) concludes, the status quo was maintained.

In view of the parameters of success discussed above, it is not a all surprising that African representatives in the French parliament and many other intellectuals in Paris construed French education, with French as the exclusive language of instruction, as the best preparation for personal and national development. As long as France remained the colonial power of Francophone Africa and thereby dictated the conditions for success, it would have been foolhardy to adopt a language policy that would have affected the education provided to the colonized people.

It is surprising that most Francophone African nations, except for Algeria, Morroco, and Tunisia where Arabic is a co-official language and Madagascar where Malagasy serves as the national language, have maintained the colonial language policy after almost twenty-five years of political independence. The main difference between the French colonial language policy and the current language policies is that instead of advocating assimilation as the primary motivation, the avoidance of "tribal conflicts" or uprisings and access to world development through a language of wider communication (LWC) are advanced as arguments against the use of Afracan languages in education (cf. Bokamba and Tlou 1977). Arguments such as the following in favor of the retention of French and the exclusion of African languages are commonly heard in Francophone African states (cf. Turcotte 1981a: 65-68):

(12) En tout état de cause, le choix du français comme langue de travail, donc comme langue officielle, laisse toute latitude à chaque Etat concerné d'utiliser cumulativement sa langue nationale. *Je dois toutefois à la verité de dire qu'en ce qui concerne mon pays (la Côte d'Ivoire), l'adoption du français, par l'article*

*premier de notre Constitution, a sans doute été l'un des facteurs
d'unité qui ont favorise l'aboutissement heureux et si rapide de
l'oeuvre de construction nationale dont Son Excellence le Prési-
dent Félix Houphouet-Boigny avait fait un des premiers thèmes de
son action. Le français, librement accepté par nous, a été un
facteur de cohesion...à l'interieur de la Côte d'Ivoire où il a
favorisé le regroupement de nos quelque cent ethnies...*(Emphasis
added.)

This statement, according to Turcotte (1981a: 66), was made on April 26,
1976, by Mr Philippe Yacé, then president of the Ivory Coast's National
Assembly. In November of the same year, in an interview published by the
newspaper Fraternité-Hebdo, Mr Jules Nea, then Minister of Cultural Affairs
in the Ivory Coast national government, was quoted as having argued against
the teaching of any Ivory Coast languages in the schools (Turcotte 1981a:
66-67). He maintained that there is no single Ivory Coast language that
could be chosen at that time to serve this purpose, and that the task of
choosing 4 or 5 languages to be eventually introduced as subjects in the
schools had been given to a research team at the University of Abidjan. In
the meantime, Mr. Nea continued, French will have to remain the official
language for national development considerations (Turcotte 1981a: 67):

(13) *Le problème (de l'enseignement d'une langue ivoirienne) est très
complexe et sa complexité n'a pas échappé à la Commission Nation-
ale de la Reforme de l'Enseignement. Il est peu probable, dans
un delai plus ou moins rapproché, qu'une langue nationale puisse
être introduite dans les écoles: la multiplicité des groupes
ethniques, la diversité de nos dialectes ne favorisent pas l'
adoption d'une langue ivoirienne unique. On pourrait songer à
choisir quatre ou cinq langues representatives de chaque ensemble
de groupes ethniques.* Ce travail est confié aux chercheurs de l'
Université. A l'heure actuelle, le dioula vernaculaire et le
baoulé-agni sont *timidement enseignés à* l'Université Nationale.
*La prudence est indispensable dans un domaine aussi delicat et
complexe--qui va lentement, va surement dit-on. Mais il ne faut
pas oublier que la Côte d'Ivoire a choisi un développement ouvert
sur le monde extérieur: la necessité d'utiliser une langue inter-
nationale s'impose par de telles considerations. Le français est
non seulement la langue de l'économie, de l'administration mais
aussi de la plupart de nos écrivains.* (Emphasis added.)

It is precisely this type of attitude that has permitted the perpetua-
tion of the French colonial language policy in Senegal, Ivory Coast, Algeria,
Morocco, Tunisia, Gabon, Congo-Brazzaville, and other former French colonies
in Western Africa. While there are undeniable short-term advantages in the
retention of French as the exclusive official language and medium of instruc-
tion in most of the countries, the long term disadvantages entailed by the
policy far outweigh the present benefits. Let us consider some of these
problems, with particular reference to education and African language devel-
opment.

3.0 <u>Language Policy, Education and Language Development</u>

Access to education in the French African colonies was highly restricted:

only a small percentage of the eligible population was selected for admission into the available elementary and secondary schools. Of these, an even smaller percentage managed to complete their elementary and secondary education (Bolibaugh 1972). Facts cited by this author in connection with his study of education in Guinea, Mali, Senegal, and Ivory Coast are very revealing with respect to the inefficiency and restrictive nature of the French educational system. According to Bolibaugh (1972: 17),

(14) In 1957, the numbers (sic) of students, including Europeans, who received their baccalaureat were as follow: Guinea--5, Ivory Coast--69, and Senegal--172. In 1960, 31 Malians were awarded the baccalaureat.

Since there were virtually no university or other post-secondary training institutions in the colonies during the colonial era, a few qualified secondary school graduates were sent to France to continue their studies. A consequence of this educational infrastructure was that most of the countries found themselves with a mere handful of secondary and post-secondary graduates to shoulder the responsibilities of national administration at the advent of their political independence in the early 1960s.

Since that time, Francophone African states, like their counterparts elsewhere in the continent, have come to regard education as the most appropriate vehicle towards national development. As a result, education has become the single most expensive item in the national budgets of most governments, absorbing between 15 to 37 percent of such budgets as of 1973. Table 2 below provides an indication of the growth of the educational budgets of selected nations in the region from 1960 to 1973, and shows what percentages of these budgets are devoted to teachers' salaries by each country.

Table 2: Public Expenditure on Education in Selected Francophone Nations in Western Africa

Country	Total expenditure as % of Gross National Product			Budget			Teachers' salaries as % of public expenditure		
	1960	1965	1973	1960	1965	1973	1960	1965	1973
Algeria	2.7	4.0	6.2	12.4	14.8	19.7	86.2	82.7	--
Benin	2.8	3.9	4.3	--	22.8	28.3	54.4	75.4	72.8
Cameroon	1.8	3.6	4.1	--	18.0	19.7	--	68.8	68.5
Congo (P.Rep.)	2.5	4.1	6.7	28.9	19.0	26.8	63.3	75.9	71.3
Gabon	2.3	3.2	4.2	16.7	20.4	15.4	59.3	48.6	56.2
Guinea	2.6	4.9	5.6	14.7	19.4	20.8	--	71.7	--
Ivory Coast	4.2	5.2	7.4	15.6	21.2	37.0	--	--	56.8
Mali	1.9	4.5	4.4	18.6	28.7	27.0	64.6	73.5	77.4
Morocco	3.7	3.9	5.2	--	16.8	20.1	83.2	--	84.9
Senegal	1.7	3.7	4.2	--	19.6	--	71.3	--	--
Togo	1.9	2.0	4.2	19.2	16.9	27.8	--	70.5	53.7
Tunisia	3.3	4.0	6.0	19.8	13.3	22.8	68.2	--	--

Source: Adapted from UNESCO 1976: *Conference of Ministers of Education of Member States. Education in Africa since 1960: A statistical Review.*

The second and third most expensive budgetary items in these countries, as elsewhere, are administration and defense, respectively. It will be noticed from Table 2 that the largest portion of the educational budget in each country was spent on teachers' salaries. This means that other areas of education, e.g., class-room facilities, libraries, students' scholarships, housing, and staff development received very little support.

The wisdom of this type of allocation of scarce resources is highly questionable, especially for any developing country. The ultimate question, however, is how cost-effective have Francophone African nations been in their education? In other words, how productive and efficient has the educational system been under the present French-based language policy, given the high level of expenditure made by the nations concerned? Further, what impact, if any, has the present system had on literacy and African language development? As indicated at the beginning of this study, these questions have rarely been addressed in the literature. The discussion that follows is largely based on my own research and draws on circumstantial evidence found in UNESCO and other recent publications by individual scholars on education in Africa.

3.1 Language policy and general education. Language policy in Francophone Western Africa has affected general education in at least four different ways since the introduction of Western education in the region: (1) admission and promotion criteria; (2) learning strategies; (3) extension or application of knowledge; and (4) academic performance. Let us consider each of these aspects of the problem briefly.

It is a commonly known fact that French education is highly elitist rather then mass-oriented: only the best qualified students get admitted and are maintained in school. In transplanting this philosophy of education to its African colonies and eventually getting them to maintain it after the advent of political independence, France circumscribed educational development in Francophone Africa. While initial admission in primary one is open to all eligible children on the basis of space availability, promotion from one grade to another is strictly dependent on the pupil's performance in French and other subjects which are all taught in French. A consequence of this system of education is the disproportionately high wastage rates found in Francophone Africa.

Wastage is shown in the number or percentage of pupils that (a) repeat classes because of failure in one or more subjects, or because of failure in an admission examination, and (b) drop out of school because of poor performance at some level or lack of space in the next level of education. Table 3 cited by Barnes (1982: 8) from UNESCO (1980) and slightly adapted here for the purpose of this study, shows the magnitude of the problem as evaluated on a yearly basis from 1967 to 1977.

As evidenced in Table 3, the percentages of class repeaters in Francophone states are consistently higher than those found in Anglophone states. When repetition rates are disaggregated to show a grade per grade development not only is this Francophone vs. Anglophone contrast maintained sharply, but it also becomes evident that the first and last grades of primary education are the most critical weeding stages in the cycle. Specifically, a higher percentage of the age cohort repeat the first and last grades. These

Table 3: Total percentage of repeaters in primary education in selected African Nations (UNESCO 1985).

Country	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
French Speaking										
Algeria	12.8	12.8	12.7	12.5	12.6	12.5	12.5	12.5	12.2	13.0
Benin	19.0	18.8	17.4	19.1	20.6	17.6	21.2	21.7	21.3	20.9
Burundi	19.3	19.9	21.9	23.1	24.3	25.4	24.5	25.6	24.0	25.9
Cent. African Rep.	23.3	31.9	28.1	27.7	26.0	32.2	31.2	35.3	31.8	
Chad	32.9	26.9	27.1	29.4	31.7	34.0	36.3	36.8	37.6	
Congo	20.2	24.3	32.6	32.1	30.4	30.8	29.2	26.2	24.7	24.6
Djibouti			10.7	10.2	15.6	20.1	19.9	18.9		
Gabon				33.1	37.0	34.5	34.7	34.0	33.7	
Ivory Coast	28.5	29.4	28.0	26.6	25.2	26.1	22.9	20.9	19.1	17.8
Madagascar	28.4	28.7	29.0	28.7	31.2	24.5	17.8	24.4	20.3	
Mali	26.3	21.1	26.3	29.2	28.2	27.2	25.0	22.9	23.4	26.5
Mauritania	16.0							14.8	13.4	14.5
Morocco	30.0	29.9	29.8	29.9	29.3	29.7	29.4	28.1	28.7	27.9
Niger	22.1	20.0	19.2	18.9	18.6	17.8	16.0	13.1	12.7	12.3
Rwanda	26.4	27.8	29.6	27.8	24.2	23.7	21.1	19.0	16.9	
Senegal	17.0	19.5	19.8	19.2	17.6	17.0	16.5	16.0	15.5	14.9
Togo	34.0	34.7	33.9	31.6	33.3	35.2	32.9	28.8	28.1	27.8
Tunisia	25.4	27.5	29.2	29.3	17.0	16.8	17.1	19.3	24.3	21.6
Cameroon	32.7	29.8	28.8	28.1	25.9	26.9	26.4	25.1	25.9	18.3
Upper Volta	10.2	17.7	16.1	17.4	17.5	17.4	17.0	17.5	18.5	
Zaire	33.4	25.2	22.9	23.1	22.6	22.1	21.6	21.1	20.6	20.1
English Speaking										
Botswana			0.3	0.7	0.9	1.6	2.3	2.9	2.6	2.3
Gambia	10.8	11.0	13.5	12.0	13.2	12.8	10.7	10.4	23.9	18.5
Ghana			3.0	3.3	3.2	2.9	2.7	2.3	2.3	2.2
Kenya			5.1	5.0	5.0	5.2	5.2	5.2	6.1	6.0
Lesotho				19.8	21.6	18.5	5.5	6.0	7.8	
Malawi						17.6	17.1	16.5	17.7	16.0
Seychelles			0.6	0.5	0.5	1.2	1.8	1.1	0.4	0.6
Swaziland		16.9	10.5	15.3	15.4	13.3	10.4	10.2	10.6	10.5
Uganda								10.2	11.3	
Tanzania	2.4	2.0	1.6	1.3	1.1	0.9	0.5	0.4		
Zambia		1.8	1.9	2.0	2.0	1.9	2.0	2.1	1.7	

Table 4: Total repetition rates in percentage by grade in primary education, latest year available (UNESCO 1983).

Country	Year	Total # of Repeaters	Percentage Repeaters by Grade							
			Total	I	II	III	IV	V	VI	VII
French Speaking										
Algeria	1981	323,107	10	6	6	10	10	11	18	22
Benin	1981	75,997	18	18	18	21	22	10	18	
Burundi	1981	59,477	29	25	21	23	28	37	46	
Cent. African Rep.	1980	86,402	35	33	33	36	32	34	46	
Chad	1976	79,342	38	40	32	34	26	31	58	
Congo	1981	113,471	28	28	19	35	32	26	23	
Djibouti	1975	1,843	19	3	20	23	19	21	32	
Gabon	1980	54,017	35	50	33	32	22	21	21	
Guinea	1980	56,384	22	22	21	19	19	21	33	
Ivory Coast	1979	181,172	19	15	13	12	14	43		
Madagascar	1975	276,203	24	30	21	21	21	16	26	
Mali	1978	78,368	27	28	24	28	24	29	29	
Mauritania	1980	12,683	14	12	11	12	13	10	27	
Morocco	1981	669,870	29	25	21	25	28	46		
Niger	1978	25,848	14	4	13	15	12	14	33	
Rwanda	1981	107,164	14	21	17	14	11	11	8	7
Senegal	1981	70,898	16	11	11	12	13	15	34	
Togo	1981	183,391	37	41	35	36	30	33	44	
Tunisia	1981	213,157	20	17	16	17	18	23	31	
Cameroon	1980	413,356	30	35	25	30	24	27	38	12
Upper Volta	1981	36,765	16	13	12	13	13	15	39	
Zaire	1977	768,988	20	23	22	22	19	16	14	
English Speaking										
Botswana	1981	8,242	5	1	0	0	9	0	1	22
Ghana	1978	26,666	2	4	2	2	1	1	1	
Kenya	1975	150,919	5	5	3	4	5	4	7	16
Lesotho	1979	38,594	16	20	17	16	14	12	11	22
Sierra Leone	1977	34,250	15	19	14	15	14	13	12	12
Swaziland	1981	14,165	12	13	10	12	12	11	12	15
Uganda	1979	117,531	10	12	10	10	9	9	12	2
Tanzania	1981	43,218	1	3	3	3	0	0	0	0
Zambia	1980	19,278	2	0	0	1	2	1	1	9

facts are shown in Table 4 above (UNESCO 1983: III, 131-35).

The causes underlying these facts are all related to the question of lan-
guage of instruction. First, unlike in Anglophone countries where selected
indigenous (African) languages are used as media of instruction in primary
grades one through three, with English being offered as a subject from grade
one to six or seven and then serving as language of instruction from grade
three or four, in Francophone countries French serves this function from
grade one onward exclusively. In other words, it is simultaneously taught as
a subject and used as the language of instruction. Such a practice would be
natural and acceptable if French were the language of the target population
from which the pupils come. This is not the case in any former French colony,
however. Instead, French is used mainly as the language of work, not of
daily communication in the community, and its use in other functions requir-
ing an LWC is restricted to a small percentage of the population of any of
these nations. Further, French is learned almost exclusively in school.

In Senegal, one of the most Francophone countries in the continent be-
sides Algeria, French is spoken only by 11% of the population, while Wolof
is spoken and understood by 80%, according to a statistical survey reported
in Dumont (1983: 25ff). Except for Algeria, whose settler population repre-
sents a significant portion of the French-speaking community, it is doubtful
that any other nation can be shown to have a higher percentage of French-
speaking population.[8] In the absence of language statistical surveys, it is
impossible to provide a more accurate assessment of the popularity of French.
As with other official languages in the continent, however, the extent to
which French is spoken can be gauged indirectly on the basis of statistics
on literacy and educational achievements. In Francophone Africa, as will be
seen later, illiteracy is very high (ca. 80%) and educational achievement
are low.

To appreciated the negative impact of French-based education in Africa,
one must understand the context in which the prospective student lives. The
typical elementary and secondary school student in Western Francophone Africa
lives in a multilingual community where either the mother or father, and
often both, are illiterate and non-conversant in French. Even if one of the
parents is, or both are literate, French is rarely the language of communica-
tion in the family. Instead, one or two African languages are used as medium
of intra- and inter- family communication. Often one of these languages is
a mother tongue, and the others may be lingua francas. French in such sit-
uations is often the third or fourth or fifth language that the child encoun-
ters in his/her community, and one that (s)he can successfully avoid using
until (s)he has to communicate in a classroom situation. In summary, French
is characteristically a foreign language whose special functions in the soci-
ety make it a remote medium of communication for the child's or student's
daily activities.

Because of this socio-linguistic situation, the child who enters primary
school without prior knowledge of French is forced to become and will contin-
ue to be a parrot for much of the primary school. His/her learning strate-
gies are often reduced to simple memorization without understanding-- a behav-
ior that has also been ascribed to many pupils in English-speaking Africa
(cf., e.g., Afolayan 1976). The pupil's natural learning abilities are fur-
ther handicapped by his/her incompetence in French composition, thus making

it difficult for him/her not only to take good notes, but also to understand
written work. Consequently, the pupil cannot relate his/her classroom-ac-
quired knowledge to the daily life in his/her community, and cannot perform
well academically. If we recall that it takes a child between four to five
years to master his/her native language (that is constantly spoken at home
and in the community),[9] it is not surprising that the performance of the
African child in French in a largely non-French speaking population often
turns out to be poor relative to the number of years spent on studying the
language.

The pupil or student's difficulties are compounded by poorly qualified
teachers who, in many instances, have a mediocre mastery not only of the sub-
jects they are required to teach, but also of the language of instruction
itself. This situation obtains both in primary and secondary education
throughout much of the continent (cf. Bokamba 1976, Bokamba and Tlou 1977,
Thompson 1981). As a result, drop-out rates continue to be very high in
both primary and secondary schools. Table 5 documents this phenomenon on
selected Anglophone and Francophone African states at the primary school
level (UNESCO 1980, cited in Barnes 1982: 9).

Table 5: Total percentage of cohorts starting primary education around
1965/66 and around 1976/77 reaching the final grade of the cycle,
ranked in descending order according to survival for the last
cohort.

Country	1st Cohort	2nd Cohort	No. of Grades		
Gambia	1966	1977	6		89 95
Ivory Coast	1965	1976	6		69 92
Senegal	1965	1977	6		73 86
Morocco	1965	1977	5		58 84
Tanzania	1967	1974	7		33 84
Libya	1965	1976	6		48 80
Zambia	1968	1975	7		75 80
Egypt	1967	1976	6		78 79
Niger	1964	1976	6		48 75
Botswana	1969	1977	7		75 76
Algeria	1965	1976	6		30 73
Tunisia	1964	1977	6		67 73
Congo	1965	1977	6		61 73
Ghana	1969	1976	6		69 71
Mali	1965	1977	5		57 69
Togo	1965	1976	6		66 67
Cameroon	1967	1976	6		52 66
Upper Volta	1965	1975	6		48 62
C.A.R.	1965	1975	6		36 54
Benin	1965	1977	6		50 53
Madagascar	1964	1975	5		33 50
Rwanda	1965	1975	6		33 48
Burundi	1966	1977	6		32 47
Chad	1966	1975	6		29 33

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0   10   20   30   40   50   60   70   80   90  100%
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This Table should be interpreted as follows. The complete length of each bar shows the percentage of the age cohort that would have reached the 4th grade under normal circumstances, while the blank (i.e., white) portion of the bar indicates the percentage that actually reached the last grade of the primary education cycle (Barnes 1982: 8). It will be noticed from this table that the Francophone countries, with the exception of Senegal, have the lowest survival rates. Such drop-out rates are disastrous not only for the educational system in general, but also for the achievement of literacy for which formal education remains the primary vehicle.

The drop-out rates between the elementary and secondary education cycles, which are not documented systematically anywhere to our knowledge, are considerably higher. The end of primary education represents not only the end of schooling for the vast majority of the children, but also the most wasteful stage in the educational systems in most Francophone African nations. It is the most wasteful stage because the children who fail the secondary school admission examination are successful primary school gradu- ates. They are generally prevented from attending general secondary school because they failed to pass one of the two admission examination questions: French or mathematics.

Attrition rates within the secondary education cycle for the few sur- vivals continue to be so high that the percentage of those who reach the final year becomes insignificantly small, as Table 6 on the next demonstrates. This is a common problem throughout the continent. But what it suggests for our purposes here is that the imported system of education and language of instruction are unproductive and exceedingly costly for Africa. Given the socio-linguistic conditions under which the child learns and uses the lan- guage of instructions and the elitist-based philosophy of education adopted from France, it is unlikely that Francophone Western Africa will see signifi- cant changes in the academic performance of their children in the near fu- ture. Changes in the language policy vis-à-vis education, however, will positively affect the pupil's performance, as the facts from the United Republic of Tanzania show.

3.2 Language policy and literacy development. Language policy in Francophone Africa has had a considerable negative impact on the continuation and development of illiteracy in the region. Generally speaking, literacy education has never been a priority area in much of Africa, except in Tanza- nia, Somalia, and Ethiopia for the last ten years or so. Most African states have chosen, consciously or unconsciously, to use general/formal education as the best means to achieve literacy. As a result, very little attention has been given to literacy programs: most states spend less than 0.5% of the education budget on them and provide them very little other resources (e.g., personnel and teaching materials) to make them viable (Omolewa 1981, Bray 1981, Bokamba 1984). Because of the high attrition rates experienced by African educational institutions, few countries succeed in raising their lit- eracy rates through this avenue.

In Francophone Western Africa where school wastage rates are higher than in most other regions, illiteracy is equally rampant: 65-90% as of 1980 (cf. Bokamba 1984: 21). The major factor accounting for this situation is the language of instruction. Unlike in Anglophone and other Francophone coun- tries (e.g., Zaire, Rwanda, Burundi) where literacy education is conducted

Table 6: Percentage distribution of secondary school enrollment by grades in Selected African states (circa 1980)

Country	Year	GRADE						
		I	II	III	IV	V	VI	VII
Algeria	1980	23	21	19	17	9	6	5
Benin	1980	33	19	16	15	7	5	6
Botswana	1980	33	28	23	9	7		
Burundi	1980	17	18	19	16	11	11	9
Central African Republic	1980	30	21	17	13	8	6	5
Chad	1976	26	23	19	19	6	4	4
Congo	1980	30	20	17	20	5	3	5
Ethiopia	1981	29	22	18	14	10	7	
Gabon	1980	27	20	19	15	9	6	6
Ghana	1978	28	26	23	19	3	1	1
Guinea	1980	22	21	22	11	17	7	
Ivory Coast	1979	31	24	19	14	5	3	3
Kenya	1980	27	24	24	21	3	2	
Lesotho	1979	38	26	21	9	6		
Madagascar	1975	26	23	18	14	7	7	5
Mali	1977	31	24	24	8	9	5	
Mauritania	1980	26	29	16	12	9	8	
Morocco	1980	20	18	16	17	12	8	8
Niger	1978	31	23	23	15	3	4	2
Rwanda	1980	3	11	57	10	10	9	
Senegal	1980	24	22	19	18	8	7	3
Sierra Leone	1978	30	23	20	16	10	2	-
Somalia	1980	60	20	13	7			
Sudan	1980	28	22	24	8	8	9	
Togo	1981	25	21	22	21	4	4	4
Tunisia	1980	26	18	19	12	9	8	8
Uganda	1979	25	23	22	21	4	4	
United Rep of Cameroon	1980	24	21	19	18	7	7	4
United Rep of Tanzania	1981	24	23	25	23	3	3	
Upper Volta	1980	25	21	18	15	8	6	7
Zaire	1977	54	32	6	4	3	2	
Zambia	1980	24	29	27	10	9		
Zimbabwe	1981	56	18	11	10	3	1	

Source: UNESCO (1983: III-204-203)

first in indigenous languages and then in the official language, literacy
programs in most Francophone states in Western Africa are provided in French
at all phases. Guinea, Mali, Tunisia, Algeria, Morocco, and to a limited ex-
tent Senegal, are the only countries known to us to be using African lan-
guages in literacy and other programs of adult education. In Senegal it is
only Wolof, one of the six selected "national languages," that is currently
being used on an experimental basis: a final decision is awaiting a govern-
mental decree (cf. Botti, et al. 1978, Dumont 1983).

As in the case of formal education, the results of the few established
literacy programs in the region have remained meager. The situation has
been worsened by the primary school drop-outs who relapse into illiteracy
after a period of non-use of French. Thus when the progress made against
the battle on illiteracy in the region is measured against other regions in
the continent, Francophone Western Africa emerges as the least progressive,
as Table 7 shows (Bokamba 1984: 21).

Table 7: Growth in literacy in selected African states

| Country | Population/Millions | | Adult Literacy % circa | | |
	1979	1981	1960	1976	1980
*Algeria	---	19.6	10	--	35
*Benin	3.4	3.6	8	7	28
*Cameroon	8.2	8.7	19	--	--
*Central African Republic	2.0	2.4	7	--	33
*Chad	4.4	4.5	6	15	--
Egypt	---	43.3	26	--	44
Gambia	0.6	----	6	10	--
Ghana	11.3	11.8	27	66	--
*Guinea	5.3	5.6	7	20	--
*Ivory Coast	8.2	8.5	5	20	35
Kenya	15.3	17.4	20	45	47
Liberia	1.8	1.9	9	30	25
*Mali	6.8	6.9	3	10	--
*Mauritania	1.6	----	3	17	--
*Morocco	---	20.9	14	--	28
Mozambique	10.2	12.5	11	--	33
*Niger	5.2	5.7	1	8	10
Nigeria	82.6	87.6	15	25	34
Rwanda	4.9	5.6	16	--	50
*Senegal	5.5	5.9	6	10	--
Sierra Leone	3.4	3.6	7	15	--
Somalia	---	4.4	2	--	60
Sudan	17.9	19.2	13	20	32
Tanzania	18.0	19.1	10	66	79
*Togo	2.4	2.7	10	18	--
*Tunisia	---	6.5	16	62	--
Uganda	12.8	13.0	35	--	52
Zaire	27.5	29.8	31	15	55
Zambia	5.6	5.8	29	39	44
Zimbabwe	7.1	7.2	39	--	69

*Indicates Francophone Western Africa state.

While the role played by non-language factors in the development of literacy can be shown to be significant, the language of instruction remains *the most influential factor* in this regard.

3.3 <u>Non-development of indigenous languages</u>. The use of French as the language of instruction in literacy programs in most states in the region follows in part from the language policy they have adopted, and in part from what may be termed *a language development problem.* The exclusive use of French as the language of administration and education in the former French colonies caused the study of the African languages in the region to be neg-lected both before and after the accession to political independence. Afri-can languages were seen by the French colonial administration not only as instrumentally useless, but also as harmful to the objectives of assimilation. Consequently, French linguists never studied them seriously so as to provide grammatical descriptions for at least the major languages as was done in British and Belgian Africa. The few available grammars or grammatical sketches on the languages of the region, except for Arabic, were primarily the work of missionary-linguists (cf. Cole 1971).

Although the perception of the usefulness of African languages in the region has changed and is continuing to change slowly, their over-all instru-mental value has remained relatively the same as during the colonial period. The teaching of African languages in elementary and secondary schools is viewed by both students and parents as a waste of time, because the languages do not have *a market value.* That is, they do not enhance the chances of the learner to secure employment (Turcotte 1981a, Dumont 1983). Further, the promotion of any African language to serve as a subject of instruction or a national language for the purpose of radio and television services is viewed by politicians as a divisive undertaking. Recall in this respect Mr. Nea's statement cited in (12) above.

Each Francophone country in Western Africa has recognized either honor-ifically or in practice between two to six "national languages." These in-clude Agni-Baulé, Diola, Senufo, Bete, and Yakuba in Ivory Coast; Wolof, Serer, Fula, Diola, Mandingo, and Sarakole in Senegal; and Bambara, Malinke, Diola, Fulani, Songhai and Tamashek in Mali (B. Dumont 1973, Turcotte 1981, P. Dumont 1983). Further northwest, viz. in Mauritania, Morocco, Algeria, and Tunisia, Arabic and Berber are the dominant lingua francas. In spite of the dominant role that these "national languages" have played as the princi-pal media of communication among the populations, their study has been and continues to be neglected. In a language resource survey undertaken by the African Studies Center at the University of Illinois' library in 1983, it was found that only one-fifth (7/35) of the languages for which the library had holdings were spoken in Francophone Western Africa. The remaining 28 lan-guages were spoken mostly in the former British and Belgian Africa, as can be seen from Table 8 on the next page.

While this survey is admittedly non-exhaustive,[10] it does, nonetheless, provide a reasonable estimate of the level of development attained in the description of and publication in African languages. The availability of dictionaries, grammars, and readers in a given language is one of the best indications of the extent of its development. If we assume that there are on the average three national languages spoken in each Francophone nation

Table 3: Publications in African Languages at the University of Illinois, 1983

Language	Main location	Dictionaries	Grammars	Readers
1. Afrikaans[1]	South Africa	+	+	+
2. Akan	Ghana	+	+	+
3. Amharic[1]	Ethiopia	+	+	+
4. Arabic[1]	Northern Africa	+	+	+
5. Bemba[1]	Zambia	+	+	+
6. Berber[2]	North West Africa	+	+	
7. Duala[2]	Cameroon	+	+	
8. Efik/Ibibio[2]	Nigeria	+	+	
9. Ewe	Ghana, Togo	+	+	+
10. Fula[2]	Senegal	+	+	+
11. Ganda	Uganda	+	+	+
12. Hausa[1]	Nigeria	+	+	+
13. Igbo[2]	Nigeria	+	+	
14. Kikuyu	Kenya	+	+	+
15. Kikongo	Zaire, Congo	+	+	+
16. Lingala	Zaire, Congo	+	+	+
17. Luba-Lulua[2]	Zaire	+	+	
18. Mandeka/Bambara	Mali	+	+	+
19. Mende	Sierra Leone	+	+	+
20. Ndebele[1]	Zimbabwe	+	+	+
21. Nubian[2]	Sudan	+	+	+
22. Chinyanja	Zambia	+	+	+
23. Kinyarwanda[2]	Uganda, Rwanda		+	+
24. Shona[1]	Zimbabwe	+	+	+
25. Somali	Somalia	+	+	+
26. Sotho[1]	Lesotho	+	+	+
27. Swahili[1]	Eastern Africa	+	+	+
28. Tonga[2]	Zambia, Zimbabwe	+	+	+
29. Tswana	Botswana	+	+	+
30. Venda[2]	South Africa	+		+
31. Wolof	Senegal, Gambia	+	+	+
32. Xhosa[1]	South Africa	+	+	+
33. Yao[2]	Mozambique	+	+	+
34. Yoruba[1]	Nigeria	+	+	+
35. Zulu[1]	South Africa	+	+	+

(1) Languages for which more than 50 titles are accessioned; (2) languages for which holdings are less than 5 items in each category.

in Western Africa, the publication of reference resources in only seven of them respresents very little progress, especially when compared to other regions in the continent. In fact, if Duala and Ewe, which are also spoken in Anglophone states in the region, are omitted from consideration, the total number of languages with dictionaries, grammars and readers identified in Table 8 falls to five.

The reasons for this paucity of publications are not difficult to determine. As indicated earlier, French colonial administrations discouraged and neglected the study of African languages: they had no use for them and therefore saw no need to describe them. Since 1960, when most of the countries in the region acceded to political independence, African politicians have demonstrated the same degree of neglect for these languages. Centers for applied linguistics established in the mid-sixties in most of these countries (e.g., Centre de Linguistique Appliquée de Dakar, Institut de Linguistique Appliquée at Abidjan) have focused their research on the improvement of French teaching materials (Turcotte 1981a, P. Dumont 1983), rather than on the description of the national languages. Of the six national languages recognized in Senegal, only Wolof has benefited of any serious study thus far. This situation is paralleled elsewhere in the region. In other parts of the continent, in contrast, the study of African languages is at a much higher level of development: most of the lingua francas in each country have at least a grammar and dictionary of some sort.[11] This is the case with the Ghanaian, Nigerian, Zairean, Kenyan, Tanzanian, Zambian, South African, and Botswanan national languages.

The paucity, and in many cases the total lack, of language reference resources, combined with the lack of qualified language teachers, create a vicious cycle in the debate on language policy formulation. It is often argued, for example, that African languages cannot be adopted as media of instruction, because they (a) are not developed, and (b) require considerable investments in the training of teachers. Clearly, as long as African languages in Francophone Western Africa remain *unstudied* and *unused as either subject or media of instruction,* they will never develop the lexicon and registers that will permit them to serve adequately the administrative, academic, and professional functions they are called to serve. Consequently, the language policy in the region will never change.

To prevent this situation from becoming a self-fulfilling prophesy, the cycle must be broken by commissioning over a period of several years the linguistic study of selected lingua francas in each country so as to lead to their eventual teaching as subjects and then adoption as national languages. The success of Tanzania, Somalia, and Ethiopia in the use of Swahili, Somali, and Amharic, respectively, as national languages has clearly demonstrated that the task is not impossible. In order for Francophone African leaders to succeed in this endeavor, they must, first, develop the *desired political will;* and second, they must plan carefully their course of action. Currently the desired political will is lacking in most of the leaders, although a few are moving in this direction. Guinea, Mali, Senegal, and Cameroon are among these. Such a change will undoubtedly impact positively on various aspects of education: formal and informal, as has been the case in Tanzania, Somalia, and Ethiopia (cf. Hinzen and Hundsdorfer 1979, Mochiwa 1984, Adam 1980, Bender et al. 1976).

It cannot be over-emphasized that the study of most of the languages identified in Table 8 above was undertaken primary by missionary-linguists for religious and educational purposes (cf. Cole 1962, 1971). The demand placed on these languages by various educational institutions since the beginning of this century have necessitated further research that has not only increased the number of publications on them, but has also enhanced their level of development in a manner which is unparalleled by Francophone West African languages. As long as the national languages of this region are not used in some major functions or others in education and administration, they will never reach the level of lexical and registral development that will enable them to compete against French as media of communication in these areas.

3.4 <u>Language maintenance and shift</u>. The extent to which a given language or group of languages spreads essentially depends on two major factors: the population that uses it, and the function(s) which it is called to serve. For example, a language that has a small native-speaker population will not spread, i.e., increase the number of speakers, unless it is transmitted to the offspring of the said population and/or it is acquired by speakers of other languages. Whether the children of the native-speakers of this language and other inhabitants acquire it will depend on the prevailing sociolinguistic conditions in the target area. These conditions include the actual or perceived status of the language; whether it is spoken regularly at home and in the community/region; whether it has any socio-economic value (e.g., use as the language of market place, employment opportunities, education).

A language that is perceived as having no socio-economic value, other than cultural, is likely to decline in its currency as its speakers shift to one or more other language(s). Ultimately, this decline could lead to language decay and then language death or loss. Such a development may occur as a result of built-in natural linguistic and demographic pressures, as indicated earlier; and could also be the consequence of nationalistic factors as expressed in language planning. The subordination of one or more languages to another or others as a result of the elevation of a particular language to the status of national language has been known as one of the major contributing factors in language decay and death (cf. Kahane and Kahane 1979, Dressler 1982). The decline of Greek and Latin in the Roman Empire in the 4th and 5th centuries, respectively, Breton in France and Slovenian in Carinthia in modern times, and the death of hundreds of American Indian languages in North America in recent history[12] are clear examples of the type of subordinating and restrictive language policy that may result from nationalistic factors (cf. Brosnahan 1963, Kahane and Kahane 1979, Dressler 1982, Leap 1981).

The decline and eventual decay of a language in cases involving language policy formulation, either by a colonizing power or a nationalistic government, come about not only a consequence of social changes, but also as a result of a perceived loss in the prestige of such a language. As Dressler (1982: 324) aptly observes with regard to language decay:

(14) Speaker reflect this unfavorable change sociopsychologically by a
     less favorable evaluation of their language. A consequence is a
     socio-linguistically restricted use of their language, which
     results in an impoverished linguistic structure for their language.

This impoverishment has a feedback on the speakers' sociopsycholog-
ical evaluation, because the quality for guaranteeing the prestige
function and the self-identification function (and hence the unify-
ing/separating functions) of the language has diminished. Aslo the
sociolinguistically restricted use has a parallel feedback effect.

Once the speaker of a language have reached this conclusion, viz. that their
language has little or no socio-economic value and prestige, it is difficult
to reverse the trend in the decline of the language. The unsuccessful at-
tempts to raise the status of Irish in Ireland (Macnamara 1970), Welsh in
Wales (Lewis 1982), and Yiddish in Central and Eastern Europe (Fishman 1982)
are illustrative of the difficulties that a "fallen" language encounters.

African regional or national languages in Francophone Western Africa
will be headed towards *an irreversible decline* and ultimately certain death
unless their current state of neglect is changed. A number of symptons point
in this direction. First, most of these languages, as indicated previously,
remain unwritten and unstudied in any serious fashion. Second, they are not
taught anywhere as subjects of instruction so as to permit youngsters to
acquire them as second languages in their communities or country. Third,
many children who are born and grow up in the big cities do not learn their
mother tongues well, and often not at all; as a result, they become alienated
from their cultural roots. A consequence of this fact is that the languages
concerned lose the best segment of the population that would otherwise sus-
tain them. Fourth and finally, because French is perceived as *the* prestige
language and language of socio-economic upward mobility, the teaching and
learning of any indigenous language at school is seen as a waste of time.
Accordingly, such languages are devalued from an instrumental perspective.
This perception can only be changed by an active language policy that allo-
cates to these national and/or regional languages the kind of functions they
deserve within the context of a changing African society that must maintain
its own cultural identity and heritage, while adapting to an increasingly
interdependent world.

4.0 Conclusion and Recommendations

What we have seen in the preceding sections is that the evolution of the
French colonial language policy in Western Africa was closely related to the
French colonial objectives: the exclusive use of French as the language of
education and administration was intended to facilitate the cultural, politic-
al and economic assimilation of the colonized people so as to ensure French
domination. A consequence of this language policy, which lasted from 1826 to
1960, was the neglect of the study of the regional languages in the colonies
concerned. While there have been other cases of language imposition in the
modern history of colonialism (cf. Broshnan 1963, Kahane and Kahane 1979, Heath
1982), no other colonial power is known to have pursued the ever-encompassing
assimilation policy practiced by the French in Africa.

At the beginning of the 1960s the newly liberated countries inherited
this policy and its consequences in education, both formal and informal. Al-
most a quarter of century after the advent of political independence in the
region, the policy has remained largely unchanged; and its negative effects
are increasingly being felt in education, language development, and the psy-
chosociological behavior of the children. While a few educators and linguists

in the region are advocating a change in the language policy, those in power
want to and have succeeded in maintaining the status quo for various reasons.

4.1 <u>African languages as tools for development</u>. What is at issue here
is not only the future of African languages in Francophone Western Africa,
but also the future of education and its applications in the region. Admit-
tedly, some African languages will die a natural death as their populations
decline slowly over the years. In many cases this stage will not be reached
for several centuries, while in others it may only take a short time. Very
few linguists and anthropologists encourage the death of languages, but the
multiplicity of African languages makes any realist welcome such a develop-
ment for national integration purposes.

If Africa is to develop both as a geographical and cultural region, it
must preserve its cultural heritage. And this cultural heritage is in its
languages, many of which are spoken inter-regionally and internationally.
Berber, Arabic, Diola, Fula, Bambara/Mandinka, Agni-Baulé, Senufo, Ewe,
Duala, and Wolof, are among such languages in Francophone Western Africa.
These languages must be preserved and enriched, because they can be the most
effective tools of personal and national development: they can be used as
media of instruction, literary development, litercy education, communication
at the local, regional or national government level, communication for inter-
nal trade and commerce, etc. Since inhabitants of most the states in the
region already know one or two of the lingua francas spoken in their country,
the advantages that they present in serving the above-mentioned functions
clearly outweigh those offered by French. Once these languages become asso-
ciated with certain important functions in the society, their prestige will
rise accordingly and the people will become more motivated to learn them, be-
cause they represent both societal resources and potential investments. As
Scotton (1982: 65) correctly observes,

(15)   A resource is something that can be turned to for help or support.
        An investment is something to which people commit themselves for
        future advantage; adding a language is an investment of effort and
        identity...
        The power or performance of a language as a resource determines
        whether or not a person will seek to learn it. Languages which
        are added are valued not in terms of their specific content,...
        but rather in terms of how they "work" (or do not work); that is,
        they are valued in terms of their interrelation with the other
        societal elements to which learners have access.

These societal elements include "educational attainment, educational systems,
political parties, ethnic membership," the individual's linguistic repertoire,
and the functions to be performed by the acquired language (Scotton 1982:
63-72). In short, African languages in Francophone Western Africa can become
valued resources, and therefore tools for personal and national development,
if other societal conditions are changed.

It is fallacious to argue that the adoption of selected African lan-
guages as national languages, and thereby media of instruction, will neces-
sarily entail the exclusion of French in the communicative functions of the
nations concerned. This has not happened in Tanzania or Madagascar where
English and French, respectively, continue to be used as languages of wider

communication for international and some national functions. Any objective
researcher who has been to West and other parts of Africa will recognize that
French and English are international languages whose role as the languages of
diplomacy, international trade and commerce, science and technology cannot
easily be replaced in the near future by African languages, or any other lan-
guage for that matter. As long as this is true, Africans will continue to
learn and use them in a complementary fashion with African languages.
French, therefore, has nothing to fear from a language policy change in
Francophone Western Africa or elsewhere in the continent (cf. Houis 1971).
Ethnic rivalry is certainly a major factor to be reckoned with in any lan-
guage policy formulation in Africa, but it is not an insurmountable difficul-
ty.

    4.2 Implications for LP and LP theory. Over a decade ago, Fishman pro-
posed a typology of language policy decisions in which he suggested that
factors influencing the type of language policy a developing country may
adopt can be grouped under three categories: (1) Type A, (2) Type B, and
(3) Type C (Fishman 1971).

    Type A decisions, according to Fishman (1971: 30),

    (16) ...are those which come about as a result of consensus (at least
          in 'leading circles') that there is neither an over-arching socio-
          cultural past (i.e., no pervasive feeling of unity of history,
          customs, values, or missions traceable into the reasonably distant
          past) nor a usable political past (i.e., no pervasive tradition
          of independence, self-government, hallowed boundaries) that can
          currently serve integrative functions at the *nationwide* level.
          It is felt by *elites* in decision-making capacities that there is
          as yet no indigenous Great Tradition (no widely accepted and
          visibly implemented belief-and-behavior system of *indigenously
          validated greatness)* that all or most of the inhabitants can im-
          mediately draw upon to make them one people and their country one
          nation.

In view of this perception, Fishman suggests, the language policy adopted in-
variably involves the selection of an LWC (i.e., a language of wider communi-
cation or international language). This LWC is often the language of the
former colonial master.

    In contrast to Type A decisions, Type B decisions characteristically are
based on a general perception that there exists a Great Tradition in the
country. This great tradition, according to the author, is based "upon long-
established socio-cultural unities, and, ...well-established political boun-
daries as well" (p. 39). In contradistinction to Type A decisions,

    (17) There is widespread consensus--not limited only to *elites* but
          most consciously and ideologically elaborated by them--that a
          single Great Tradition is available to provide the indigenized and
          symbolically elaborated laws, beliefs, customs, literature, heroes,
          mission, and identity appropriate for nationwide identification
          (Fishman 1971: 39).

When this type of perception exists, the choice of a language policy leads to

the selection of an indigenous or indigenized language to serve as the national language. Such a policy contributes to and benefits from nationalism at its best.

As for Type C decisions, those are characterized by the existence of what Fishman (1971: 45) terms *conflicting or competing multiplicity* of Great Traditions, none of which is clearly dominant. Fishman observes that,

(18)   Since each of these Great Traditions is numerically, economically, and ideologically strong enough to support separate and large-scale socio-cultural and political-operational integration, their co-occurrence within a single policy makes for rather constant internal tension and for nationalistic disunity, particularly in the absence of superordinate threat.

Thus to avoid continued conflict, a multilingual policy is adopted, with a foreign LWC serving as the official language at the national level, and the indigenous lingua francas of the great traditions serving as regional languages (Fishman 1971: 45-48). It is hoped, in this case, that the LWC will eventually not only lessen the linguistic rivalries, but would also create a sense of national unity and integration.

Fishman's typology does undoubtedly describe a number of African states. For instance, Tanzania, Somalia, and Ethiopia could be identified, to a certain extent, as Type B decision countries. But both Tanzania and Ethiopia could also be viewed as Type C nations from a cultural and linguistic perspective, as there are other major languages and cultures that have been subsumed under the present language policies which have favored two of the languages in these countries, viz. Swahili in Tanzania, and Amharic in Ethiopia. Most of the countries in Africa, and particularly in Francophone Western Africa, fall within Type A and Type C decisions. In this regard, their adoption of LWC-based language policies is justifiable.

There are, however, a few countries that are either strictly or predominantly monolingual, but have not adopted an indigenous language as a national language. Cases in point are Botswana, Swaziland, and Lesotho where English continues to serve as the official language. In Francophone Western Africa, the focus of this study, Mauritania, Morocco, Algeria, and Tunisia have maintained French as the official language, although Arabic is the most well-established culture and dominant language. Fishman's typology cannot account for these apparent anomalies. But if it is modified to incorporate the colonial legacies factors discussed in this paper and the central role that socio-economic factors play in determining the language(s) that individuals choose to invest in, these anomalies become explainable. That is, the countries in which Type B decisions could have been made but have chosen instead Type A and C decisions, have done so because of three major considerarations/factors: (1) colonial legacies (in language policy, education, international political links, and economic infrastructure), (2) political inertia (resulting from fear of political conflicts and fear of loss of one's previleged position of employment), and (3) lack of self-esteem with regards to one's native languages. Included somewhere in these factors is the question of misconception concerning the proper place of African languages in national and international affairs—a question that can be properly addressed

only if there is political will on the part of the leadership. This, more than anything else, is what has distinguished Ethiopia, Somalia, and Tanzania from other African states.

4.3 <u>Conclusion</u>. We have attempted to show in this study that the current language policies in Francophone Western Africa are the results of both colonial and post-colonial policy-decisions. While the intentions of African leaders in maintaining a status quo on the inherited language remain unknown, those of the French colonial administrations have been well-documented. In continuing this policy, African decision-makers have consciously or unconsciously espoused the very ideas that debased and colonized them both physically and mentally. As long as this mental colonization continues, the disastrous effect of the French-based language policy will persist in education and language development for years to come. Over the years many African languages will be irretrievably lost without a trace, since they will not have been written. The educational systems will continue to be not only highly inefficient, but will produce more and more *cultural misfits* who will be comfortable neither in their own culture nor in that of their former colonial masters. In consequence, these "intellectuals" will become increasingly dependent on France and the West for their survival and that of their nations.

To avert this situation, Francophone African states must develop what we have termed elsewhere (cf. Bokamba 1981, 1984) comprehensive language policies. Such policies involve the objective allocation of functions to indigenous LWC and foreign LWC. French, for instance, can continue to serve the functions of language of instruction at the university level, language of international research, trade, commerce, and diplomacy; while selected national languages are given the role of media of instruction in pre-university education, and media of communication at the national, regional, and local levels of government. In other words, a multilingual policy is being advocated here. To achieve such objectives in the case of Francophone Western Africa, the national languages will have to be seriously and carefully studied. Personnel will have to be trained under government-sponsored programs through higher education. With such careful and long-range planning, the region will be able to overcome its present difficulties in this area with minimal sacrifices.

<div align="center">NOTES</div>

[*]I am grateful to Kay Williamson, Braj B. Kachru, and an anonymous reviewer for their comments on an earlier version of this paper. The responsibility for any errors of facts and/or interpretation are mine alone.

[1]The focus of the discussion here will be mainly on black Francophone Africa, but most of the issues dealt with apply to all former French colonies in the continent.

[2]Specifically, this is what Alexandre (1963: 54) states in this connection:

Lorsque le Parlement [français] discuta de l'emploi des langues vernaculaires dans l'éducation, ce fut sur la proposition de membres métropolitains, et *les députés africains s'opposèrent à cet emploi, en expriment le soupçon qu'il s'agisse d'une manoeuvre destinée à empêcher leurs enfants de beneficier d'une éducation de niveau identique à celle des métropolitains. Plutôt qu'un effort en faveur des langues vernaculaires, ils exigeaient l'extension pure et simple, et sur une large échelle, à leur pays, du système d'éducation métropolitain.* (Emphasis added.)

[3] This figure includes the two Cameroons: British and French Cameroon. Separate figures were not given in the sources consulted for this study.

[4] An alternative view was proposed by the so-called "evolutionist" or "associationist" school. This school, which included people like Emile Durkheim, Joseph Gobineau, Levy Bruhl, Alfred Fouille, and Gustave Le Bon, held that Africans and other colonial people were primitive, and hence considerably different from the French both mentally and culturally. In view of this, they maintained, the best approach to use in colonizing and educating them was to let them "evolve gradually" towards French civilization by providing them rudimentary training in education, political and economic organization; rather than by treating them as French equals. This school of thought opposed the universal use of French as the medium of education in the colonies. For further discussion of this view, see Lokulutu (1982).

[5] For some discussion of this question, see for example Morgenthau (1964), Crowder (1968), Calvet (1974), and Lokulutu (1982).

[6] Guinea opted for immediate political independence in 1958 and rejected the offer to join the Franc zone; instead, she established her own monetary unit. It must be recognized here, however, that these countries' readiness to accept the "French Union" was largely due to economic considerations. Many of them were extremely poor and their economic survival depended on France.

[7] Other decrees referring to this aspect of the policy included the following (Turcotte 1981b: 83-85):

Article 64, de l'Arreté No. 1633 du 2 novembre, 1912. *Aucun livre ni brochure, aucun imprimé ni manuscrit étrangers a l'enseignement ne peuvent être introduits à l'école sans autorisation du Lieutenant-Gouverneur* (sic). La langue française est seule en usage dans les écoles. Il est interdit aux maîtres de se servir avec leurs élèves des idiomes du pays.

Article 45, de l'Arreté No. 302, du 22 février 1913. La langue française doit être la seule employée. Les dialectes locaux sont rigoureusement interdits.

In a circular of July 1, 1914, of Governor-General W. Ponty concerning private education, it was reiterated that all schools, whether religious, private or public, are subjected to the same language policy and objectives in education

(cf. Turcotte 1981b: 85):

> A cet egard, il est inadmissible que l'enseignement privé, confession-
> nel ou non, échappe à tout contrôle et demeure libre de développer dans
> l'esprit des enfants des tendances qui puissent contrarier nos desseins.
> *De même que l'école officielle, l'école privée n'a de raison d'être que
> comme instrument de la cause française, comme telle, elle est tenue aux
> mêmes obligations que l'école officielle et son existence ne peut être
> tolerée que dans la mesure où elle observe les principes suivants, dont
> vous voudrez bien imposer l'application dans votre colonie.* (Emphasis
> added.)

[8] Turcotte (1981a) estimates that between 30-40% of the Ivory Coast's
population knows French. These estimates appear to be considerably exagger-
ated, especially in view of the facts (a) that Senegal, the former head-
quarter of "French West Africa" (i.e., Afrique Occidentale Française) and
the greatest beneficiary of the French education, has a French-speaking
population of only 11% (Dumont 1983: 324), and (b) that Ivory Coast has a
much smaller educated population that Senegal.

[9] See Eric Lenneberg (1967), The Biological Foundations of Language.
New York: John Wiley & Sons.

[10] The University of Illinois' library is one of the top three largest
university libraries in the United States. Its acquisition in African
studies is very extensive and representative of the published works on the con-
tinent. While there may be a few references that the library has not yet
acquired, the present collection on African languages represents a good
sample from which certain conclusions can be drawn about the work done thus
far in the study of these languages.

[11] It is to be pointed out here that the study of Lingala and Kikongo,
which are spoken in both Zaire and Congo-Brazzaville, was mainly undertaken
by missionary-linguists in Zaire (then the Belgian Congo). Work done on them
by French and Congolese linguists is a more recent venture, circa 1970s.

[12] It has been estimated that there were around 500 American Indian langu-
ages in the United States during the colonial period, but over 250 of these
are now extinct as a result of U.S. language and educational policies towards
Indians (cf. Leap 1981).

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BINDING DOMAINS IN KIKUYU

George N. Clements

Kikuyu, like many other languages of Africa, employs special verb forms in the class of syntactic constructions consisting of relative clauses, *ex situ* wh-questions, and focus constructions involving preverbal focused elements. This class of constructions shares the further property of being subject to a uniform set of constraints governing positions that are accessible to extraction rules ("island constraints"). It is argued here that the uniquely distinctive characteristic of these constructions is that they consist of *open clauses*, that is, simple clauses whose S-node dominates an indexed PRO-form but does not dominate its antecedent. The notion *binding domain* is characterized as a maximal sequence of open clauses.

1. Introduction. In a number of African languages, widely distributed across the continent, we find special verb forms whose occurrence is restricted to a specific set of syntactic environments, typically including relative clauses and never including simple main clauses. This phenomenon is found in languages as linguistically diverse as Hausa, Akan, and Swahili. Up to the present time, no linguist has offered a formally coherent account of this type of morphological system, although several writers have taken note of its existence. Schachter (1973) was the first, to my knowledge, to comment on the linguistic interest of a number of highly specific phonological and morphological parallels between relative clauses and focus constructions in several unrelated languages including Akan, Hausa, and Ilongo (a Malayo-Polynesian language spoken in the Philippines). Other writers have pointed out that wh-questions commonly exhibit formal parallels with one or both of these two construction types in certain Bantu languages (Myers (1971), Heny (1971), Takizala (1973), Andrews (1975), Epée (1976a,b), Bokamba (1976). Elsewhere in Africa, what appear to be similar or related phenomena have been identified in a wide variety of languages, including Kpelle (Welmers (1964)), Diola-Fogny (Sapir (1965)), Tera (P. Newman (1970)), Fula (Arnott (1970)), Igbo (Robinson (1974)), Yoruba (Stahlke (1974)), Hausa (R. Newman (1976)), Kanuri (Harries-Delisle (1973,1978)), and Efik (Cook (1978) and personal communication). This morphological phenomenon is not restricted to the African continent, and has been found in such diverse languages as Jacaltec (Craig (1977)), Telugu, Malagasy, and Chippewa (Harries-Delisle (1973,1978)), as well as Ilongo, mentioned earlier.

In the Africanist tradition, some scholars have used the term "relative tense" to describe specially marked verb forms occurring in such environments. However, this term is poorly chosen. Tense is not involved at all, at least not directly; the distinction between "relative" tense forms and simple main-clause forms is not one of tense, but of syntactic construction. Moreover, the special verb forms in question are most often not restricted to relative clauses, but are found in other contexts as well, normally (as indicated by the literature cited above) in wh-questions, or in certain types of focus construction. The use of the term "relative tense" suggests that the occurrence of these

forms in relative clauses is primary and that their use elsewhere is secondary, an assumption for which little or no evidence is cited in the literature.

This morphological phenomenon is articulated with particular clarity in a Bantu language of East Africa, Kikuyu.[1] In this language there is a class of syntactic constructions (including relative clauses) which are treated as equivalent by several independent rules of grammar. In this study we shall attempt to determine exactly what this class of constructions has in common. Our solution, if correct, will have some interest for syntactic theory in general, as it depends upon the recognition of a relation of *syntactic binding* holding between two arbitrarily distant elements, one of which may be phonologically null. Such abstract relations are presumably found in most or all languages, but only some languages - prominently, those of Africa - encode them in the form of special morphological features of the verb. By examining the characteristics of syntactic binding relations in Kikuyu, it will be shown that the class of syntactic constructions in question is not an arbitrary grab-bag, but crucially involves a notion of syntax that I will call the "open clause".

This class of constructions, which I will refer to mnemonically as "class B" due to the crucial role played by the syntactic binding relation in accounting for its coherence, has the following members:

(1) a.   *ex-situ* wh-questions in which the questioned constituent occurs clause-initially;

  b.   preverbal-focus constructions, in which a clause-initial constituent is marked as the bearer of focus;

  c.   relative clauses

These constructions behave as a unified set with respect to both syntactic and morphological rules. Let us consider the syntactic rules first. Just as many other languages, Kikuyu allows sentences to exhibit "long-distance" or unbounded dependencies between an overt noun phrase and a position in the sentence from which an identical noun phrase is understood to have been extracted (i.e., moved or deleted). In English, for example, we find sentences such as *Who do you think I said Bill saw?* in which the object of *saw* has been extracted, and a dependency exists between that position and the initial question word *who*. In English, such extractions are subject to certain constraints originally termed "island constraints" by Ross (1967), which account for the ungrammaticality of sentences like *Who do you think Mary knows a person who saw?* (illustrating a violation of Ross's Complex NP Constraint) or *Who do you think Mary wondered who saw?* (illustrating a violation of the Wh-island Constraint (Chomsky (1977)).

A similar set of constraints upon long-distance dependencies exists in Kikuyu. In Kikuyu, however (which contrasts with English in this respect), such constraints may be circumvented in a fairly free manner by the use of "resumptive pronouns" in the position of a nonsubject gap. We shall examine relevant constructions just below. Our first point, then, will be that the constructions of class B form a unified set with respect to the island constraints of Kikuyu.

If we turn now to Kikuyu morphology, we find that a certain number of rules of word formation, affecting the morphological shape of verbs, apply in this same class of constructions. Certain of these rules apply individually in other construction types as well, but they apply *jointly* only in the constructions of class B. The rules in question

are the following:[2]

(2) a. a verbal suffix consisting of the downstep element /$^!$/ is deleted. When not deleted, this suffix is realized to the right of the first complement following the verb (such as the direct object) if there is one, and otherwise at the end of the verb. In most tenses, tonal forms of the verb are different in other respects as well. ‚

      b. If the extracted element is a class 1 (typically, singular human) subject, then the usual subject prefix (SP) of this class, /á-/ (with underlying high tone, indicated by the acute accent), is replaced by the class 1 pronominal prefix (PP) /o-/ (with underlying low tone, unmarked in transcriptions). This latter prefix is used elsewhere in the concord system for pronouns and for noun qualifiers other than adjectives.

      c. In negative clauses, the negative prefix /-tí$^!$-/ is replaced by /-tá-/.

These points can be briefly illustrated as follows. (3a) is a simple declarative sentence, and (3b-d) are the corresponding class B constructions as defined in (1) above: (3b) is an *ex-situ* wh-question, (3c) is a focus construction, and (3d) is a relative clause. [3]

(3) a. Kariokì á-$^!$tém-íré mo-tê$^!$ 'Kariūki cut a tree'
              SP-cut-T   CP-tree
      b. nó.o   o-tɛm-íré mo-te?   'Who cut a tree?'
              FP-who   PP-cut-T
      c. né Káriokì ó-tém-$^!$iré mo-te   'it's Kariūki (that) cut a tree'
              FP   PP-cut-T
      d. mondo o-riǎ ó-tém-$^!$íré mo-te   'the person (that) cut a tree'
              person PP-DEM   PP-cut-T

The following abbreviations will be used in grammatical glosses: SP=subject prefix, PP=pronominal prefix, T=tense/aspect prefix or suffix, CP=nominal class prefix, DEM=demonstrative modifier, FP=focus particle. The latter is an element occurring preposed to nouns and verbs which indicates the scope of focus, and whose basic shape is /né/; it combines with the wh-pronoun *o* 'who' to form its clause-initial alternant *nó.o*, as we see in (3b).

(3a) illustrates the simple main clause form of the verb, formed in this tense (the simple past completive, which is used in all affirmative past tense examples except when otherwise indicated) by prefixing the appropriate SP and suffixing the tense/aspect suffix -*íré*. As it is not a class B construction, this sentence does not display the special properties indicated in (2a,b). In particular, as required by (2a), the verbal downstep suffix /$^!$/ occurs in its expected position to the right of the following complement,[4] and the verb shows the "normal" tone form appropriate to a simple main clause. (The downstep internal to the verb originates in the preceding noun, and has nothing to do with the downstep suffix just mentioned.) Furthermore, as is required by (2b), we find the SP /á-/.

(3b) illustrates the subject question corresponding to (3a). Both of the properties described in (2a.b) are illustrated here. First, we find a new tonal form of the verb, which does not have the clause-final downstep suffix. Second, the SP /à-/ has been replaced by the PP /o-/.

(3c) is the subject-focus construction corresponding to (3a), and illustrates the same properties as (3b). (The fact that the low-toned PP /o-/ bears surface high tone in this example is explained by a phonological rule of Downstep Displacement, which converts a tone sequence of the form $H^!L^*$ (where L^* = one or more L tones) to one of the form $HH^{*!}$; this rule has affected the first two syllables of the verb, which bear low tones at an earlier stage of derivation. and explains the downstep occurring internally in the verb. As the tone rules of Kikuyu are fairly complicated, I will not attempt to give an account of surface tones in the remainder of this study, except where directly relevant to the discussion. Interested readers are referred to Clements and Ford (1977) for a fuller account of phrase-level tone rules.)

Finally, (3d) is the subject relative corresponding to (3a), and shows the same morphological properties as (3b.c).

The replacement of the negative prefix /-tí¹-/ by /-tà-/ can be illustrated by the examples given in (4). (4a) is an affirmative sentence, (4b) the corresponding negative, and (4c) the subject question corresponding to (4b). [5]

(4) a. ka-aná   γá-'tém-íré   mo-tè¹   'The child cut a tree'
       CP-child SP-cut-T   CP-tree
    b. ka-aná   γá-tí-ná-tém-'á mo-te   'The child didn't cut a tree'
                 SP-NEG-T-cut-T
    c. nó.o   o-ta-ná-tem-á   mo-te?   'Who didn't cut a tree?'
       FP-who   PP-NEG-T-cut-T

In (4a) and (4b) we find the class 12 SP -γá-. in concord with the cl. 12 (diminutive) subject noun *kaaná*. As we see in (4b), the main-clause form of the negative prefix is -*tí*-, while -*ná*- is the tense prefix required in this negative tense (see Armstrong (1967), Barlow (1964) for discussion of verb morphology). In (4c), which has *nó.o* 'who' as the subject, we find that the class 1 PP -*o*- appears as the verbal prefix, indicating that we have a "class B" environment. In confirmation of this, the negative prefix shows the alternant -*ta*- (with different consequences for tonal realization).

We have given an overview of a number of syntactic and morphological phenomena which demonstrate the unified nature of class B constructions. In order to see exactly what the members of this class have in common, we will now examine their structure more closely. At the same time we will give examples confirming our as yet unsupported claim that these constructions are subject to a set of island constraints similar in nature to those found in English and other languages.

Before doing so, however, it would be appropriate to remark on certain phonological rules affecting vowel sequences which, though irrelevant to the syntactic analysis as such, affect the surface form of Kikuyu words, often making their morphological structure difficult to decipher. The processes relevant to the examples in this paper are listed below:

(5) a.   au → ɔi
    b.   aɔ → ɔɔ
    c.   ae → ɛɛ
    d.   ɔɔ → wɔɔ
    e.   ou → uu

These processes are illustrated below. (6a) presents a table of the subject prefixes (SP) for all six persons, illustrated with a paradigm of the verb *-tɛm* - 'cut' in the simple past completive tense. As this stem is consonant-initial, the prefix vowels show up in their basic form. (6b) presents corresponding paradigms of three vowel-initial verb stems for comparison, illustrating the effect of the rules of (5), as well as several others which will not be involved in our later examples. Tones are not marked.

(6) a.

		sg.	pl.		-tɛm- 'cut'
1. p.	N-	to-		ndɛmirɛ	totɛmirɛ
2. p.	o-	mo-		otɛmirɛ	motɛmirɛ
3. p.	a-	ma-		atɛmirɛ	matɛmirɛ

b.

-et- 'call'		-ɔn- 'see'		-uɣ- 'say'	
njetirɛ	twetirɛ	ɲɔnirɛ	twɔɔnirɛ	njuɣirɛ	tuuɣirɛ
weetirɛ	mwetirɛ	wɔɔnirɛ	mwɔɔnirɛ	uuɣirɛ	muuɣirɛ
ɛɛtirɛ	mɛɛtirɛ	ɔɔnirɛ	mɔɔnirɛ	ɔiɣirɛ	mɔiɣirɛ

In addition to rules affecting vowel quality, other rules affect vowel quantity. For example, a long vowel is shortened when occurring in the same syllable as another vowel (*ɛɔɔ* → *ɛɔ*, etc.). All these rules apply both within words and across word boundaries. In order to make the examples more intelligible, I have not indicated the effect of such rules in the subsequent transcriptions in this paper. The reader may convert the transcriptions into actual spoken forms by applying the rules of (5) and the vowel shortening rule, with appropriate tonal adjustments. Further discussion of vowel coalescence processes can be found in Armstrong (1967, chapter 3).

    2. Constraints on Extraction Rules. *Ex-situ* wh-questions are formed, as we have seen, by preposing a question word such as *no.o* 'who' and leaving a gap in the position from which the questioned NP has been extracted. That the dependency between the question word and the related gap is unbounded is suggested by sentence (7a) below, and many similar sentences: [6]

(7) a. nó.o ó-ɣw-aciíri-a Ngoɣa a-úɣ-íre áta Kama.ú a-ón-ˈíré?
      FP-who SP-T-think-T   SP-say-T that   SP-see-T
      'Who do you think Ngūgī said that Kamau saw?'

Here the dependency extends two clauses down, relating *nó.o* 'who' and the object of *aón'íré* 'saw'.

    When the extracted element occurs in an island, as illustrated in (7b-d), the result is ungrammatical:

(7) b. *nó.o Káma.ú a-ón-ˈíre mó-ndo   o-reǎ   ó-ríng-ˈíré?
      FP-who   SP-see-T CP-person PP-DEM PP-hit
      'Who did Kamau see the person (that) hit?'

   c. *nó.o Ngoye a-écírí-rιε hííhι no.o o-ɔn-i'rέ?
          SP-wonder-T   PP-see-T
     'Who did NgũgĨ wonder who saw?'
   d. *nó.o Kàma.ú a-ón-'i'rέ Kaanàkέ mbέrε ya?
          SP-see-T   front   of
     'Who did Kamau see Kanake in front of?'

(7b) illustrates a violatιon of Ross's Complex NP Constraint, in which a questioned
element has been extracted from within a relative clause; the ill-formed dependency here
holds between an element occurring outside the relative clause (the question word *nó.o*)
and a gap occurring within it (the extracted object of *óring'íré* 'hit'). (6c) illustrates
a Wh-island Constraint violation, here, the illicit dependency holds between the question
word *nó.o* and an object gap occurring in a clause that contains another extraction,
involving the subject. (6d) illustrates the fact that phrases consisting of a form of the
nominal modifier /-a/ 'of' followed by a NP constitute islands; a pronominal NP in such a
construction cannot enter into a dependency with an element occurring outside, explain-
ing the ungrammaticality of (7d).

    Interestingly, the ungrammatical sentences in (7b-d) can be substantially improved by
placing a "resumptive pronoun" in the position of the extracted element. Thus we find
that (7b',c') are semi-acceptable for some speakers consulted, and (7d') is acceptable for
all speakers (meanings are identical to the corresponding examples in (7b-d)):

(7) b'. nó.o Kàma.ú a-ón-'íre mó-ndo   o-reǎ ó-mó-ríng-'íré?
     FP-who   SP-see-T CP-person PP-DEM PP-OP-hIt-T
   c'. nó.o Ngoye a-écírí-rιε hííhι nó.o o-mo-ɔn-í'rέ?
           SP-wonder-T   PP-OP-see-T
   d'. nó.o Kàma.ú a-ón-'i'rέ Kaanàkέ mbέrε ya-kε?
           SP-see-T   front of-POSS

What I am terming "resumptive pronouns" in these examples consist of the 3rd. sg. OP
(object prefix) /-mo-/ in (7b',c'), and the 3rd. sg. POSS (possessive modifier) /-kέ/ in
(7d'). These formatives are identical in shape to the corresponding "free" pronominal
formatives, in all respects; that is, there is no formal distinction in Kikuyu between
"resumptive" pronouns and other pronominal forms bearing the same set of morpho-
syntactic features.

    In addition to the *ex-situ* wh-questions discussed up to this point, *in-situ*
wh-questions occur in Kikuyu as well. In whIch the question word occurs In the "logical"
position of the questioned element:

(8) Kama.ú a-ón-'íré o?
       SP-see-T who
   'Who did Kamau see?'

Such questions do not exhibit the morphological effects listed in (3). In such questions
the focus particle *nέ* cannot ben prefixed to the question word. A further feature of
in-situ wh-question formation is that only non-subjects may be questioned in this way;
subjects are obligatorily extracted, as we see by applying the morphological criteria in
(2) (see example (3b) above, for which no corresponding *in-situ* question exists).
According to the speakers whom I have consulted, *in-situ* and *ex-situ* wh-questions
are nearly or entirely synonymous. [7]

We find an entirely parallel set of constraints on extraction when we turn to preverbal focus constructions. The following examples illustrate focus constructions involving the subject, the object, and a locative complement respectively: [8]

(9) a. né Káma.ú   o-ón-ˈíré Kaanakε
FP   PP-see-T
'It's Kamau (that) saw Kanake'
b. né Kaanáké Kámá.ˈú a-ón-ˈíˈré
SP-see-T
'It's Kanake (that) Kamau saw'
c. né mbére ya mo-te oó-reǎ Kámá.ˈú a-ón-ˈíré Kaanakε
front   of CP-tree PP-DEM   SP-see-T
'It's in front of that tree that Kamau saw Kanake'

In all such cases, just as with *ex-situ* wh-questions, the focus particle *né* is obligatorily prefixed to the initial NP. In terms of discourse function, the initial NP constitutes the "focus" of the assertion in contrast to the rest of the clause, which presents the background information.

Focus constructions such as those illustrated in (9) must be distinguished from topic-alizations, which are distinct both in formal and semantic/pragmatic terms. In topicaliz-ations, the preposed element is not preceded by the focus particle *né*, and the following portion of the sentence is not characterized by the morphological processes listed in (2).

(10) mbεrε ya mo-te   oó-reǎ Kámá.ˈú a-ón-ˈíré Kaanáké ˈ
front   of CP-tree PP-DEM   SP-see-T
'In front of that tree Kamau saw Kanake'

In contrast with (9c), the postverbal downstep suffix is not deleted in (10), and appears in its normal position after the object, where it preserves the final high tones of *Kaanáké* from deletion (cf. note 4).

Focus constructions exhibit the same set of island constraints that hold in *ex-situ* wh-questions, as illustrated below:

(11) a. né Káma.ú n-gw-éˈciíri-a Ngoγe a-úγ-írε áte o-ɔn-íré Kaanakε
FP   SP-T-think-T   SP-say-T that PP-see-T
'It's Kamau (that) I think Ngũgĩ said (that) saw Kanake'
b. *né Kaanáké Kámá.ˈú a-ón-ˈíré móndo o-reǎ ó-ríng-ˈíré
SP-see-T CP-person PP-DEM PP-hit-T
'It's Kanake (that) Kamau saw the person (that) hit'
c. *né Kaanáké Ngóˈγé a-ecírí-rlé hiíhl nó.o o-ɔn-íˈré
SP-wonder-T   FP-who PP-see-T
'It's Kanake (that) Ngũgĩ wondered who saw'
d. * né Kárioki Kámá.ˈú a-ón-ˈíˈré Kaanáké mbérε ya
SP-see-T   front   of
'It's Kariũki (that) Kamau saw Kanake in front of'

Furthermore, just as with wh-questions, the island constraint violations can be circum-vented by the insertion of resumptive pronouns in the position of the extracted element. In the case of focus constructions, however, the result is fully acceptable for all speakers:

(11) b'. né Kaanáké Kámá.ʼú a-ón-ʼíre móndo o-reǎ ó-mó-ríng-ʼíré
SP-see-T CP-person PP-DEM PP-OP-hit-T

c'. né Kaanáké Ngóʼγé a-éciri-rié hiíhi nó.o ó-mo-ɔn-íʼré
SP-wonder-T FP-who PP-OP-see-T

d'. ne Kàrıokı Kamá.ʼú a-ón-ʼiʼré Kaanáké mbére ya-kɛ
SP-see-T front of-POSS

A further parallel between focus constructions and wh-questions is that the formal counterpart of *in-situ* wh-questions exists for focus constructions: that is, constructions in which the focused element remains in its basic position. In such cases, the morphological processes listed in (2) do not take place; instead, the placement of focus on an element following the verb is indicated by other morphological features of the verb.[9]

Let us turn finally to relative clauses. Relative clauses in Kikuyu are normally constructed by placing a demonstrative modifier (DEM) such as /-reǎ/ after the head noun, inflected with the appropriate PP. The relative clause follows this modifier immediately with no intervening relative pronoun or complementizer, and with no modification of the verb other than by the processes listed in (2).[10] An example follows:[11]

(12) óyo né [$_{NP}$ ʼmó-ndo o-reǎ [$_S$ o-ón-ʼíré Kaanakɛ]]
this FP CP-person PP-DEM PP-see-T
'This is the person (that) saw Kanake'

In respect to island constraints, relative clauses exhibit the same range of properties as the constructions discussed earlier. This is illustrated below:

(13) a. mo-ndo o-reǎ n-gw-éʼciíri-a Ngoγe a-úγ-íre áte Kama.ú a-ón-ʼírʼé
CP-person PP-DEM SP-T-think-T SP-say-T that SP-see-T
'the person (that) I think Ngũgĩ said (that) Kamau saw'

b. *mo-ndo o-reǎ Kámá.ʼú a-ón-ʼíre mó-ndo o-reǎ ó-ríng-ʼíré
SP-see-T PP-hit-T
'the person (that) Kamau saw the person (that) hit'

c. *mo-ndo o-reǎ Ngóγe a-éciri-rie hiíhi nó.o o-ɔn-íʼré
SP-wonder-T FP-who PP-see-T
'the person Ngũgĩ wondered who saw'

d. *mo-ndo o-reǎ Kámá.ʼú a-ón-ʼíʼré Kaanáké mbére ya
SP-see-T front of
'the person (that) Kamau saw Kanake in front of'

As in the case of focus constructions, the use of resumptive pronouns renders the last three examples fully acceptable to all speakers consulted:

(13) b'. mo-ndo o-reǎ Kámá.ʼú a-ón-ʼíre mó-ndo o-reǎ ó-mó-ríng-ʼíré
SP-see-T PP-OP-hit-T

c'. mo-ndo o-reǎ Ngóγe a-éciri-rie hiíhi nó.o ó-mo-ɔn-íʼré
SP-wonder-T FP-who PP-OP-see-T

d'. mo-ndo o-reǎ Kámá.ʼú a-ón-ʼíʼré Kaanáké mbére ya-kɛ
SP-see-T front of-POSS

Let me summarize the discussion so far. We have examined a certain range of syntactic constructions, which we have called "class B", and found that they share a significant number of properties:

- they provide a context for a set of morphological rules (2) affecting the form of the main verb;
- they involve unbounded dependencies between an overt NP and a following extraction site;
- when the extraction site contains a phonologically null element the unbounded dependencies are subject to a uniform set of constraints on extraction;
- violations of these constraints can be minimized or avoided by the use of resumptive pronouns in place of nonsubject gaps.

Most traditional theories of grammar provide no explanation for this constellation of properties. Such theories require us to list, for each rule or constraint in question, the set of syntactic constructions providing their context. No explanation is given as to why exactly the same set of constructions should behave as a single set with regard to a number of independent rules of grammar. Our problem, then, is to determine the identity of the property, call it "Property X", that is shared by all these constructions.

3. Analysis. As the preceding discussion has shown, "gaps" and resumptive pronouns stand in a relation of complementary distribution within the set of acceptable sentences exhibiting unbounded dependencies in Kikuyu. Gaps occur grammatically in "accessible" positions, that is positions that lie outside of islands, and only there. Resumptive pronouns occur grammatically in "inaccessible" positions, that is, within islands, and only there. The fact that resumptive pronouns do not occur grammatically in "accessible" positions is easily confirmed by taking note of the unacceptability of sentences like the following:

(14) *né Kaanáké Kámá.'ú á-mo-ón-'í'ré
     FP   SP-OP-see-T
     'It's Kanake (that) Kamau saw'

(compare the corresponding grammatical sentence in (9b)). This relation between "gaps" and resumptive pronouns distinguishes the syntax of Kikuyu from that of languages like English, in which island constraint violations cannot normally (in standard varieties) be circumvented by the use of resumptive pronouns.

In order to account for this range of facts, a small number of assumptions will be made regarding basic phrase-structure properties of Kikuyu syntax. These assumptions will be justified in the following discussion, but it should be added that they receive further motivation from aspects of Kikuyu syntax that cannot be dealt with here. I propose the following phrase structure rules, as a first approximation, to account for the constituent structure of full clauses (S'), the complementizer position (COMP), and the focus position (FOC):

(15) a. S' → COMP S
     b. COMP → Comp (FOC)
     c. FOC → *né* (NP)

The NP generated as an optional constituent by (15c) will be further subclassified by the feature [±WH]. If the feature [+WH] is assigned to this NP, (15c) will generate

ex-situ wh-questions: if the feature [-WH] is assigned, it will generate focus con-
structions. If NP is not expanded at all, it will generate grammatical sentences such as
the following, in which the FP *né* has been moved to preverbal position by a clitici-
zation rule:

(16) Kama.ú ne-a-ón-ˈiˈré Kaanáké
         FP-SP-see-T
     'Kamau saw Kanake'

Notice further that if FOC is not expanded in (15b), we will not generate either *ex-situ*
wh-questions or focus constructions, since the initial NP of these two construction types
must occur under the immediate domination of the FOC node. An analysis of this sort
provides a maximally straightforward account of the range of construction types under
consideration here, and will be adopted for the purposes of this study.

The present analysis accounts for a range of further observations. For example, the
rules of (15) generate only one FOC position per S'-clause , and thus predict that no
S'-clause may have both a preposed wh-question word and a preposed focus constituent.
This is correct, as the ungrammaticality of examples such as the following shows:

(17) *nó.o   né Káma.ú ó-ríng-ˈíré?
     FP-who FP   PP-hit-T
     'Who is it Kamau (that) hit?'

As long as one or the other of these elements is not preposed, the sentence is grammati-
cal, as (18) shows:

(18) né Káma.ú ó-ríng-ˈíré o?
     FP   PP-hit-T   who
     'It's Kamau (that) hit who?'

Here the question word *o* does not occur in the clause-initial FOC position, and so the
sentence is grammatical. Notice that since (18) is synonymous with the intended reading
of (17), the ungrammaticality of (17) cannot be accounted for on semantic grounds. Nor
can the ungrammaticality of (17) be due to island constraints of some sort, since the
corresponding sentence with a resumptive pronoun in place of the gap is totally
unacceptable:

(19) *nó.o né Káma.ú ó-mó-ríng-ˈíré?
                     PP-OP-hit-T

A further correct prediction of the present analysis is that two focused NPs may not
occur at the head of the same clause. This prediction follows, like the previous one,
from the fact that the rules of (15) generate only one clause-initial FOC position.
Accordingly, sentences like the following are ungrammatical:

(20) *né Kaanáké né Káma.ú ó-ríng-ˈíré
     FP   FP   PP-hit-T
     'It's Kanake (that) it's Kamau (that) hit'

As soon as one of these NPs is placed in a non-FOC position, the sentence becomes

grammatical (cf. the examples in (9a.b)), but then, of course, the second NP is no longer marked for focus. We can show once again that the ungrammaticality of (20) does not involve an island constraint violation by taking note of the ungrammaticality of the corresponding sentence with a resumptive pronoun:

(21) *né Kaanáké né Káma.ú ó-mó-ríng-'íré
 FP FP PP-OP-hit-T

For the same reason, two wh-question words may not occur in preposed position in the same clause:

(22) *nó.o nó.o o-ɔn-íré?
 FP-who FP-who PP-see-T
 'Who saw who?' (lit. 'who did who see?')

Once again the resumptive pronoun is impossible. Furthermore the ungrammaticality of (22) cannot be due to semantic considerations, since some speakers, though rejecting (22), find (23) acceptable in the same meaning:

(23) nó.o o-ɔn-íré o?

Finally, it will be observed that this analysis provides only one source for the FP *né* in any clause, namely as an element introduced under the immediate domination of FOC within COMP. It therefore follows that no clause may contain more than one occurrence of the particle *né*. This prediction, too, is correct: prenominal *né* and preverbal *né* mutually exclude each other, and so all sentences containing both of them are ungrammatical:

(24) *nó.o ne-a-ɔn-i'ré Kaanáké?
 FP-who FP-SP-see-T
 'Who saw Kanake?'

Just as in the preceding case, the ungrammaticality of sentences like (24) cannot be explained on semantic grounds, that is, as involving some sort of incompatiblity between the semantics of prenominal and preverbal *né*. To show this, it is necessary to mention a further type of *ex-situ* wh-question in Kikuyu. In the case of multiple embeddings in which the extracted wh-element binds a gap occurring at least two levels of embedding down, the wh-question word need not occur at the head of the highest clause, i.e. initial-ly in the sentence, but may occur in a synonymous reading at the head of any intermediate clause. Thus the following three sentences, which differ syntactically only in the location of the question word *nó.o,* are grammatical and synonymous:

(25) a. nó.o ó-ɣw-eciíri-a Ngoɣe a-úɣ-írɛ áte o-ɔn-íré Kaanakɛ?
 FP-who SP-T-think-T SP-say-T that PP-see-T
 b. ó-ɣw-'éciíri-á nó.o Ngóɣe a-úɣ-írɛ áte o-ɔn-íré Kaanakɛ?
 FP-who
 c. ó-ɣw-'éciíri-á Ngóɣe a-úɣ-íré ate nó.o o-ɔn-íré Kaanakɛ?
 FP-who
 'Who do you think Ngūgī said saw Kanake?'

However, the freedom of occurrence of such "wandering" question words is subject to the restriction that no question word may appear at the head of a clause containing preverbal

né. (26b) is ungrammatical for this reason: [12]

(26) a. né-kó Ngóγe a-úγ-írε áte Kama.ú ne-a-ón-ˈíˈré Kaanákéˈ?
    FP-where   SP-say-T that   FP-SP-see-T
b. *Ngoγe a-úγ-íré ate né-kó Káma.ú ne-a-ón-ˈíˈré Kaanákéˈ?
                  FP-where
c. Ngoγe a-úγ-íré ate Kama.ú ne-a-ón-ˈíˈré Kaanáké ˈkó?
                                   where
all meaning: 'Where did Ngũgĩ say (that) Kamau saw Kanake?'

Since both the *ex-situ* wh-question (26a) and the *in-situ* wh-question (26c) are grammatical, (26b), which has the same intended meaning as both of these, cannot be ill-formed on semantic or logical grounds. Its ungrammaticality can, however, be explained by the fact that the set of rules (15) generates only one occurrence of the FP *né* per clause, and so cannot generate (26b).

Relative clauses will be generated by the following base rule: [13]

(27) NP → NP S

This rule characterizes relative clauses as right complements of NPs, and assigns them the categorial status of simple clauses, S, as opposed to complementizer-introduced clauses, S'. The choice of S as opposed to S' is motivated by the fact that neither complementizers, relative pronouns nor (preposed) focused NPs can occur initially in a relative clause in Kikuyu. Were rule (27) to expand the relative clause as S' rather than S, thereby allowing a FOC position to be generated in clause-initial position, these exclusions would be unexplained, and would call for a set of special statements to account for them. The following sentence demonstrates the inability of focused NPs to occur at the beginning of a relative clause:

(28) *mo-ndo o-reǎ né Káma.ú ó-ríng-ˈíré
     CP-person PP-DEM FP   PP-hit-T
     'the person (that) it's Kamau (that) hit'

The explanation for the ungrammaticality of (28) cannot be that the dependency between the head of the relative clause and the gap involves an island constraint violation, since the corresponding example with a resumptive pronoun is also ungrammatical:

(29) *mo-ndo o-reǎ né Káma.ú ó-mó-ríng-ˈíré
                      PP-OP-hit-T

Nor can the ungrammaticality of (28) be due to any semantic restriction on the occurrence of focused NPs within relative clauses, since focused NPs occur freely in relative clauses as long as they do not occur in the highest (matrix) clause. This variety of facts is explained most simply by the syntactic solution proposed in (27).

On the basis of these assumptions, we may return to the property of "class B" constructions remarked on earlier, namely that in acceptable sentences in Kikuyu, "gaps" and resumptive pronouns stand in a relation of complementary distribution. This situation is summarized below:

(30) a. gap in accessible position: grammatical
        né Kaanáké Kámá.ˈú a-ón-ˈíré ___
        'It's Kanake (that) Kamau saw'
   b. gap in island: ungrammatical
        *né Káriokĩ Kámá.ˈú a-ón-ˈíré Kaanáké mbére ya ___
        'It's Kariūki (that) Kamau saw Kanake in front of'
   c. RP in accessible position: ungrammatical
        *né Kaanáké Kámá.ˈú ó-mo-ón-ˈíˈré
                                    OP
        (same meaning as (a))
   d. RP in island: grammatical
        né Káriokĩ Kámá.ˈú a-ón-ˈíré Kaanáké mbére ya-kɛ
                                                        POSS
        (same meaning as (b))

To account for this distribution we will postulate the following rule of Coindexing and
Deletion:

(31) Coindexing and Deletion

            NP   [$_S$ X [+PRO] Y]
      SD: 1   2   3   4
   SC: (a) coindex 1 and 3
            (b) delete the terminal node of 3 if 3 occurs In an
                "accessible" position with respect to 1

Part (a) of the SC accounts for all unbounded dependencies of the type under consider-
ation in this study. It might well prove that such coindexing is better carried out in some
other way, e.g. by a separate rule, or by the free generation of indices in the base and
the provision of filtering principles to rule out ill-formed linkages. As the study of
coindexed structure as such is not the subject of this study, we will leave this issue
open, and turn to the part (b) of the rule, which is of more interest here. This part of
the rule carries out the deletion of "accessible" pronominal elements which are bound, by
coindices, to a full NP to their left. It must be assumed that coindices of the sort under
discussion here (those involved in the characterization of unbounded dependencies
between two elements in "class B" structure) are formally distinguishable from coindices
that might be proposed for other purposes, such as the statement of relations of free
anaphora. As most current syntactic theories draw such a distinction in one way or
another, I will suppose that this assumption is unproblematical.

    (31) provides a full account of the facts summarized in (30): index-bearing
pronominals will fail to be deleted (and will survive In the form of resumptive pronouns)
if and only if they occur in islands with respect to their antecedents. [14]

    4. Binding Domains in Kikuyu. We have now provided a basis for understanding
the fact that the "class B" constructions of (1) behave in a uniform way with respect to
island constraints: they do so by virtue of the fact that they are all derived by a single
rule, (31). It is not yet clear, however, why the morphological rules listed in (2) should
be able to apply to just this class of constructions. The problem is that under a reason-
ably constrained view of syntactic theory, rules of grammar do not have access to the
derivational history of their inputs, except to the extent that previous rules have left
indirect effects of their operation in the form of traces, indices, and the like.

Given the analysis developed so far, however, it should be clear that the constructions of class B share a common structural property as a result of the operation of (31), namely the formal relation of coindexing that holds between two NPs under the conditions stated in the SD of (31).

We may characterize this structural property in the following way. Let us define the notion *open clause* as any clause S whose root node dominates an indexed pronominal [+PRO] and does not dominate its (coindexed) antecedent. Schematically, given a structure of the following form containing an unbounded dependency between a pronominal element $[+PRO]_i$ and its antecedent NP_i, we may say by virtue of the definition that S_1 through S_n are open clauses, while other Ss in the structure (i.e. those dominating S_1 or dominated by S_n) are not. In particular, S_{n+1} is not an open clause:

(32)
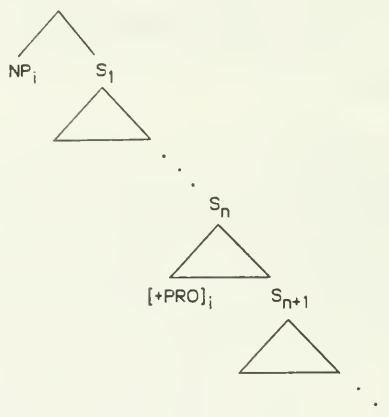
Intuitively, an open clause is one containing an unbound variable of a particular type: an indexed pronominal.

Under the analysis developed so far, all the members of "class B" syntactic constructions have the following form:

(33) NP_i $[_S$ ... $[+PRO]_i$ ... $]$

They are thus all instances of the schema (32), abstracting from the presence of the lower clause S_{n+1}. The context for the application of the morphological rules of (2) may now be stated as "main verb of an open clause."

But what of more complex structures involving multiple embedding? The definition of open clause given above makes two predictions regarding such structures: first, that the main verbs of clauses dominating NP_i will not exhibit the morphological characteristics

in (2), and second that the main verbs of clauses not dominating the pronominal element [+PRO] will also fail to exhibit these characteristics. Both of these predictions are true, as we shall now see.

We have already seen examples that allow us to test the first prediction, in the earlier discussion of "wandering" wh-question words. The sentences of (25) contain three levels of embedding, as follows:

(34) $[S_1 \ ... \ [S_2 \ ... \ [S_3 \ ... \ ] \ ] \ ]$

In all cases, the pronominal "gap" (subject of the lowest verb) is in S_3. These sentences differ among themselves in the location of the antecedent. The structure of these examples is schematized in (35):

(35) (25a): $NP_i \ [_{S_1} \ ... \ [_{S_2} \ ... \ [_{S_3} \ ... \ [+PRO]_i \ ... \ ] \ ] \ ]$

(25b): $[_{S_1} \ ... \ NP_i \ [_{S_2} \ ... \ [_{S_3} \ ... \ [+PRO]_i \ ... \ ] \ ] \ ]$

(25c): $[_{S_1} \ ... \ [_{S_2} \ ... \ NP_i \ [_{S_3} \ ... \ [+PRO]_i \ ... \ ] \ ] \ ]$

By the definition given above, the open clauses are S_1, S_2 and S_3 in (25a), S_2 and S_3 in (25b), and only S_3 in (25c). Accordingly, we expect that if any of the morphological rules of (2) are applicable, they will affect only the open clauses, and thus fail to apply to S_1 of (25b) and S_1 and S_2 of (25c).

The morphological evidence confirms our expectation. It will be recalled that in some tenses (such as the current past completive, illustrated here), special tonal forms are used for verbs in "class B" constructions. If we now examine the tonal structure of the main verbs in S_1 and S_2 in (25), we find the "special" tonal form *óyweciíria* in (25a) and the "normal" tonal form *óyw'éciiriá* in (25b,c). Similarly, we find the "special" form *aúyíre* (with H tone influence on the following complementizer *áte*) in (25a,b) and the "normal" form *aúyíré* (with no H tone influence on *ate*) in (25c). The lowest verb, *ooníré*, has its "special" form throughout. This is entirely in conformity with our analysis. Main verbs have their "special" forms if and only if they occur in open clauses. The tonal variation found in sentences such as (25) is a direct consequence of the fact that rules of tonal morphology have access to the notion "open clause", as characterized above.[15]

Let us consider now the second of the two predictions, concerning the morphological behavior of clauses satisfying the description of S_{n+1} in schema (32). We expect that such clauses will not show the characteristics of (2), even when the conditions under which these rules apply are otherwise satisfied. Examples such as (36) show that our expectations are again fulfilled:

(36) a. Nó.o Káma.ú a-ér-'íré Kaanáké áte o-tem-íré mo-te?
          FP-who   SP-tell-T   that PP-cut-T CP-tree
       'Who did Kamau tell Kanake (that) cut a tree?'

b. Nó.o Kàma.ú a-ér-ʲírέ àte Karìokĩ à-ʲtém-írέ mo-tĕʲ?
    SP-cut-T
'Who did Kamau tell (that) Kariũki cut a tree?'

c. Nó.o ó-γw-ecìíri-a o-uγ-írέ ate Kama.ú á-ʲtém-írέ mo-tĕʲ?
    SP-T-think-T   PP-say-T   SP-cut-T
'Who do you think said (that) Kamau cut a tree?'

In (36a), the wh-word *nó.o* binds a gap (in our analysis, a coindexed, phonologically null pronominal) in the subject position of the lowest clause. Hence, no clause satisfies the description of S_{n+1} in (32); all clauses are open clauses, and we expect them to exhibit open-sentence morphology. In (36b), on the other hand, *nó.o* binds a gap in the object position of the main clause, and in (36c) it binds a gap in the subject position of an intermediate clause. Thus the lowest clauses of both (36b.c) satisfy the description of S_{n+1} in (32), and we do not expect them to exhibit open-sentence morphology.

Our analysis is confirmed in two ways. Notice first that in (36a) the lowest verb, 'cut', exhibits the effect of rule (2b), which replaces the SP /á-/ with the PP /o-/; (36b.c), however, retain /á-/. More importantly, we see that the postverbal downstep has been deleted by rule (2a) in the lowest clause in (36a), while it is retained in (36b.c), preserving the final high tones of *motέ* in both instances. In other words, downstep deletion has taken place in (36a), where the lowest clause is an open clause, but not in (36b.c), where it is not.

The evidence discussed in the last three paragraphs provides particularly strong evidence for the central role of the notion "open clause" in Kikuyu grammar, and so for its importance as a category of linguistic theory. Without this notion - or some notion similar to it - we would be unable to explain the full range of data discussed in this paper in a convincing way. We would have to resort, in one way or another, to a listing of the environments in which the morphological rules of (2) apply.

The evidence from Kikuyu demonstrates that certain rules of grammar may refer to the notion "open clause" in their structural description. The fact that in Kikuyu, as in many other languages, the property of being an open clause is registered on the verb rather than on some other category suggests that certain mechanisms may "encode" this property on the verb in the form of an abstract feature, which is realized in surface structure (or not) according to the morphology of each particular language.

We may finally characterize the notion *binding domain* as a maximal chain of open clauses $S_1 \ldots S_n$ meeting the structural conditions stated in (32), within which morpho-logical or phonological rules may apply in some languages under conditions specific to these languages, as in the case of Kikuyu. The operation of these rules provides an overt morphological encoding of the domain of discontinuous dependencies within a given sen-tence, crucially depending on abstract aspects of hierarchical clause structure, such as the presence of phonetically null elements. [16]

NOTES

[1] The variety of Kikuyu reported on in this paper represents the speech of university students enrolled at the University of Nairobi. I would especially like to thank Ngũgĩ wa Karenge (Mũrang'a District), John Gĩtaũ (Mũrang'a District), and Wambũi Kaire (Nairobi District, formerly of Kiambu District) for their help. All linguistic examples cited in the text were checked with each of these individuals, who were generally very consistent in their judgements (disagreements are noted in the text). Most examples were later rechecked with Mrs. Lillian Mwanĩki, of Nairobi, during her stay in Cambridge, Massachusetts in 1979-80.

[2] A fuller account of the phonology and morphology of Kikuyu nouns and verbs can be found in Clements (1984). The "relative" tense forms of that paper are the "special" forms briefly described in (2a,b). The distribution of the postverbal downstep is somewhat more complicated than is indicated in (2a), in ways that do not bear directly on the analysis of this paper. For example, as first observed by Ford (1976), the downstep suffix is absent in all negative tenses, where there is no reason to suppose that it forms part of the underlying tonal morphology of verbs at all. It is also absent in yes/no questions, as the result of a general rule deleting *all* downsteps in such questions. On the other hand, the downstep suffix appears in all *ne-* tenses (tenses formed with the focus particle *né*), regardless of whether the verb in question occurs in a "class B" construction or not; for an example, see (26) below. It should be added, finally, that in the fuller analysis of Clements (1984), the downstep is not actually deleted in "class B" environments, but simply fails to be inserted by the rules of inflection.

[3] Transcriptions in this paper follow the system used in Clements (1984). Tonal diacritics are as follows: /á/ high tone, /â/ falling tone, /ǎ/ rising tone, /a/ low tone (unmarked). The raised exclamation point /ˈ/ represents downstep. Wh-question intonation, affecting the last two syllables of a sentence only, is represented here by the question mark /?/. Vowel sequences within a word are single syllables except where separated by a dot, e.g. /au/ is one syllable and /a.u/ two; the tone of each syllable is

marked on the final vowel. Transcriptions do not reflect the phonological effect of syllable fusion across word boundaries. In glosses, hyphens isolate inflectional affixes; derivational morphology is not indicated except in the case of the noun class prefix. Finally, standard Kikuyu orthography is used in the transcription of proper names, where $\bar{i}, \bar{u}, e$, and o have the phonetic values [e, o, ɛ, ɔ] respectively, and vowel length is not indicated.

[4] Although the downstep element is unpronounced, its presence at the end of sentences like (3a) may be verified not only by extrapolation from the rules that account for its presence sentence-internally, but also from its effect upon immediately preceding high tones and rising tones. Such tones are normally lowered to low in sentence-final position, but retain their underlying value on the surface if a sentence-final downstep follows. In the case of (3a), for example, the rising tone on the final syllable of *moté* indicates that a downstep follows, since if no downstep were there, it would be realized as a low tone. Conversely, since the lexically-determined rising tone of *moté* surfaces as a low tone in (3b-d), we know that no downstep follows.

[5] As observed in note 2, the failure of the sentence-final downstep to appear in (4b,c) is due to the morphological fact that no negative tenses have the downstep suffix, no matter what syntactic context they appear in.

[6] The word-final high tones in *aɔn'íré* in this sentence, as well as in the final verbs of (7b',c'), (11b',c'), and (13b',c') below, might appear to be unexplained exceptions to the rule mentioned in note 4 that lowers word-final high tones when not followed by downstep. There is a phonological explanation for this apparent exceptionality, however. As shown in Clements (1984), verbs in tenses formed without tense prefixes, including the current past completive illustrated in these examples, have a floating low tone suffix which predictably blocks the operation of two tone rules, one of which is the tone lowering rule in question.

[7] Most speakers whom I consulted in the preparation of this study were unable, after consideration of relevant examples, to find any semantic or pragmatic distinction between corresponding *in-situ* and *ex-situ* questions, although one speaker felt that only *ex-situ* questions were appropriate when the person to whom the question is addressed is asked to identify one or more individuals or objects from a previously-established set.

[8] The vowel of the PP is lengthened with the demonstrative /-reã'/ to express the sense 'that (yonder)' (cf. Benson (1964:395), Armstrong (1967:12), Barlow (1960:36)). When this form is used as a definitizer, as in the relative clause examples elsewhere in this paper, the PP vowel has its normal length.

[9] Namely, absence of the preclitic FP, and certain tonal modifications (Clements (1984)).

[10] This analysis is in agreement with that of Barlow (1960), who writes (p. 56): "Kikuyu relative sentences are expressed without a relative pronoun. (...) When the antecedent is definite, one of the demonstrative adjectives *ũyũ, ũrĩa, ũcio,* &c., must be associated with it. (...) In general propositions the demonstrative is optional."

[11] The occurrence of the FP as an apparent "copula" in this sentence is unrelated to the fact that a relative clause follows.

[12] Final high tones and rising tones are realized as falling tones under question

intonation.

[13] Under certain assumptions, for instance those of Jackendoff (1977), a phrase-structure rule such as (27) is ill-formed due to the fact that an identical category appears on both sides of the rewrite arrow. Nothing of consequence hangs on this feature of our analysis. however. Further investigation might show reason to assign the NP to the right to a lower rank. within a theory of X'-syntax.

[14] No attempt is made here to provide a formal account of the conditions under which a coindexed pronominal is "accessible", i.e. deletable under the operation of (31b). Such an account would be of considerable interest. but would take us far beyond the more modest goal of the present discussion, which is to explain the array of data in (30) in the context of the problem of characterizing "class B" constructions.

[15] Here I will point out an unexplained anomaly which arises under the tonal analysis assumed elsewhere in this study. In (25b,c), one would expect the postverbal downstep suffix to appear after verbs displaying their "normal" tonal forms. However, the downstep suffix has apparently been deleted in all three cases, as well as in the highest verb in (26c). One possible hypothesis, which I have not been able to investigate, is that the downstep suffix is deleted sentence-internally after any verb that falls within the logical scope of a wh-question word. What the exact nature of this rule is, and whether it holds for all speakers, must await further study.

[16] In recent work, Zaenen (1983) has formalized a notion of syntactic binding related to the one presented here within the framework of Lexical-functional Grammar, showing that it accounts for a wide range of linguistic phenomena, both morphological and syntactic. Bergvall (1983) examines further aspects of syntactic binding phenomena in Kikuyu, showing that an apparent class of island constraint violations involving inanimate antecedents is explained by an independent rule of inanimate object-prefix deletion; she makes the interesting observation that *in-situ* wh-questions are subject to the same set of island constraints as their *ex-situ* counterparts.

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LANGUAGE DIFFERENCES IN STRATEGIES FOR THE
INTERACTIONAL MANAGEMENT OF CONVERSATION[1]

Chet A. Creider

Abstract

Data from videotaped conversations in a number of East African languages
and in English are used to establish the existence of a preference in the African
interactional systems for the use of verbal feedback by listeners in contrast
to a preference for the use of non-verbal (gaze, head nod) feedback in English.
This difference is related to different understandings of the meaning of gaze
behavior and to differences in preferred mutual postural orientation for
conversation, deixis, and speaker turn length between the English and the African
systems.

Work by sociologists on the organization of conversation has produced evidence for
the existence of a variety of structures in terms of which conversational interactions
function. The turn-taking system is discussed in Sacks, Schegloff and Jefferson's 1974
Language article, "A simplest systematics for the organization of turn-taking in
conversation." A later article in Language by the same group of authors discusses the
repair system (Schegloff, Jefferson and Sacks 1977). The system organizing the beginning
and ending of conversations was discussed in lectures by Sacks under the label, "the overall
structural organization of conversation." Due in part to the recency of this work, there
has been little attempt to study the organization of conversation from this perspective
in languages and cultures other than English. One exception, Moerman 1977, presents
evidence that Tai conversation, in at least one aspect, the repair system, functions almost
exactly like English.

Because conversation is ultimately at the basis of all social interaction, and because,
in fact, a surprisingly strong case can be made for the genesis in conversation of "abstract"
knowledge and more generally for the interactional nature of the creation of knowledge[2],
it is of considerable importance to know if the conversational systems of all human cultures
operate in ways which are basically the same.

Most anthropologists' instinctive answer to this question is 'impossible,' but a reasonable
argument can be made for suspecting that the above surmise is indeed correct. On an
empirical level the list of similarities between Tai and English conversations provided
by Moerman is very impressive. On a less specific level, the kinds of systems found to
operate in conversation operate with reference to sets of structural positions in
conversations (transition-space for turn-taking, 'repair-initiation opportunity space' for
repairs (Schegloff, Jefferson and Sacks 1977, 375)) which may be presumed to exist (i.e.
to be definable and utilizable by interactors) in all conversations, regardless of the language
being used. The systems in which these structural positions are utilized, moreover, appear

to have as a primary objective (or 'conspiracy') ensuring that a speaker has a 'fair chance' to speak in the face of a variety of potentially disturbing factors (such as competition between two listeners for next turn). A 'fair chance' for a speaker can be regarded as a kind of minimal requirement for meaningful conversation (anywhere), and hence the possibility appears of language-independent conversational systems. In general then, it can be argued that to the extent that the subtle ways in which conversation is organized are due to the nature of interaction itself (i.e. to the functional requirements which any system which is to organize conversation must be responsive to) then culture- and language-specific conventions may not be found.

In this paper I make no attempt to address in an overall way this question of language/cultural differences in interactional system. I present some empirical evidence for the existence of language-specific differences in the preferred mode (communicational channel) of realizing particular interactional functions (or effecting particular kinds of interactional behaviour) in conversation. I then argue that these differences have impact on other interactional subsystems and more generally on the kind of interactional work that is accomplished with conversation.

More specifically, the difference in preference for eye contact in interaction between English and a number of East African languages is studied. The massive presence of the difference is first established, and then the existence of an alternative mechanism is described. This mechanism itself allows certain differences in the sequential organization of conversation, and thus will be seen to shed light on the major issue outlined above.

Data from videotaped conversations from a number of East African languages (Kipsigis, Luo, Gusii, Samburu) establish the existence of a preference in the African interactional systems for the use of verbal feedback by listeners in contrast to a preference for the use of non-verbal (gaze, head nod) feedback in English. The existence of this latter preference for English has been noted in a number of studies, e.g. Kendon 1970, Birdwhistell 1971. Godwin 1981 is especially relevant as he notes that eye contact is a necessary precondition for the initiation of an utterance directed at another. My own work, reported below, fully supports this finding, which by now must be regarded as fully established.[3]

The preference for verbal feedback by listeners in the African conversational systems is related to differences in other aspects of the interactional systems: different understandings of the meaning of gaze behavior (supportive and interested for English, hostile and rude for the African systems), preferred mutual postural orientation for seated conversation (facing or angled for English, side by side for African), deixis (speaker and listener 'points of view' are the same in the African systems, but mirror images of each other in English), speaker turn length (shorter in African conversations), use of and response to negative questions (answer more strongly presupposed in English conversations), etc.

Although they are not examined here, I also claim that there exist other language/cultural differences in the use of particular communicational channels to effect particular communicational functions and that these differences have an impact throughout the rest of the set of interactional systems which organize conversation for particular cultures. Some examples are the use of syntactic resources versus the use of stress/intonation for signalling marked focus, and the use of hand movements versus the use of syntactic resources as cohesive devices (in the sense of Halliday and Hasan 1976).

I do not of course want to argue that each language is a thing-unto-itself. One of the major outcomes of work into a variation-based theory of language universals (see for example E.L. Keenan 1976), has been the realization that a framework in which attention is paid to specific differences is a viable way, paradoxically, of investigating that elusive

creature. Language, with a capital L, or in our case, Conversation, with a capital C. I suggest as worthwhile tasks for the next stage of investigation the accumulation of further data such as those presented in this paper, and then the elaboration of a general theory of the interactions of the behavioral components themselves in implementing the various functional prerequisites of conversational interaction.

Some of my own data now follow. For four conversations, one between two Canadian English speakers (male and female, university students, VT 46), one between two Kipsigis elders (VT 1-1), one between two Kipsigis secondary school students (one male and one female, VT 27-3), and one between two Luo elders (VT 20-1), I recorded the presence or absence of gaze directed at the other interactor every thirty seconds (this period is considerably longer than the average turn length and so eliminates any intra-utterance effect that might be present). The results are as follows.

	A	B	Mutual
VT 46 (English)	19/30	22/30	15/30
VT 1-1 (Kipsigis)	3/27	2/27	1/27
VT 27-3 (Kipsigis)	5/31	5/31	2/31
VT 20-1 (Luo)	10/21	3/21	1/21

in percentages:

	A	B	Mutual
VT 46	63.3	73.3	50.0
VT 1-1	11.1	7.4	3.7
VT 27-3	16.1	16.1	6.4
VT 20-1	47.6	14.3	4.8

The magnitude of contrast involved here would be duplicated with any set of conversations from my data. Note especially the very high (50%) incidence of mutual gaze in the English conversation and the extremely low incidence rates for all of the African conversations. Note also the close agreements between interactors within a conversation, VT 20-1 being the only exception in this respect.

Another way of assessing the utilization of non-verbal versus verbal feedback is to compare the frequency of use of verbal listener feedback in the conversations. In the English conversation the number of 'yehs' and similar utterances which functioned to indicate comprehension but which were not elicited by a preceding interrogative utterance was 28 out of a total of 266. In the Kipsigis conversation (VT 27-3) the number of such utterances in 266 turns was 73 ($p < 0.01$, binomial test).

Verbal and non-verbal strategies have different implications for some fairly obvious matters such as turn length. Given the opportunity to ensure that the listener is attending as a speaker speaks, the speaker need not pause as frequently 'in the course of a turn', but may, provided the listener is attending, construct lengthy turns. Not utilizing non-verbal feedback it is to be expected that the African conversants would create more frequent opportunities for listener verbal feedback, and hence that average turn length would be shorter in these conversations.

In the videotape 46 English conversation the average number of words per turn was 13.2 while in the comparable Kipsigis conversation (27-3) this average was 4.8 (p<0.01, t-test). These figures were based on a 73 turn sample in the case of the English and a 108 turn sample in the case of the Kipsigis. The extremes of the distributions are revealing: there were 37 (34.2%) one word turns in the Kipsigis conversation and 9 (12.3%) one word turns in the English conversation. At the other end of the distributions, there were 3 Kipsigis turns of more than 20 words: 21, 22, and 28. There were 13 such English turns including 46, 48, 50, 78, 81 and 85 word turns.[4]

I want to emphasize that the differences in eye contact are differences in preference only. That is, both systems include both mechanisms for feedback. The use of non-verbal behaviour increases dramatically in African conversations which are not dyadic. This may be understood as follows: In all systems an increase in the number of speakers means an increase in competition for the floor. It is clear that non-verbal means are more efficient than verbal ones for this purpose (they take up less sequential space, do not involve potential loss of the floor through giving it temporarily to the listener, etc.). This means that with dyadic conversations we have two possibilities. Either there is more competition for the floor in the English dyadic conversations and less in the African dyadic ones, or there are cultural conventions which operate to keep a system adapted to competition operative in circumstances under which it is strictly speaking not necessary. That is, English dyadic speakers could use less non-verbal feedback but don't. Regardless of which possibility is actually the case it is clear that cultural conventions do operate in this micro-arena even when they are strictly speaking unnecessary. Even if the second possibility is not the case, and the first one is, then either English speakers in dyadic contexts maintain, by convention, a level of competition which is in a functional sense unnecessary, or African speakers, by cultural agreement, operate with lowered levels of competition in dyadic contexts.[5] We may further note that while non-verbal behaviour is more functional under conditions of greater floor competition, it is in general a less preferred alternative: it involves an extra modality, restricts operating freedom, etc.

It will be clear from the foregoing that African speakers and listeners are oriented in conversation to expect frequent and regular verbal feedback from listeners, and that furthermore this means that regular gaps are provided in the production of utterances by speakers in the expectation that listeners will fill them in, and moreover fill them in with such productions as will not take the floor away from current speaker. This may also be looked at from the point of view of the listener: whose utterances are accorded a floor of their own and are secure from being overlapped. An interesting linguistic difference may be related to this, one which is regularly noted, but has never been understood in any way: listener responses in English are subject to very severe mandatory ellipsis constrictions, while the same types of utterance in the African conversations do not even allow ellipsis (VT 46):

G: Aah, Brescia [local college], where're you from?
P: Tronuh [Toronto]
Note that utterances such as
P: I'm from Toronto
are regularly non-occurrent in this position. Contrast the Kipsigis (VT 5-2b):
B: ee, iyapuu ano oo?   'Where do you come from?'
A: apunuu komosito isinee lekemaani.   'I come from down this way.'
Examples such as this are of regular occurrence in the African conversations.

A somewhat more subtle linguistic difference which may result from the 'expanded floor' of the African systems is the following (VT 46, English):

G: You mean, like, you didn't come to do Anthropology?
P: No. Like, I wanted Anthropology, I definitely wanted it, but ... (continuation not

relevant)
and later in the same conversation
G: Where? Not here?
P: No, I'd like to do the U.B.C.

In each of the above cases P's no's would be realized as 'yes'es' in the African languages,
as shown below (VT 27-3, Kipsigis):
A: mm, ki, oo, maatoopwaan ak loorit-is?
B: ee, matakeepwaan ak loorit, keepwaan een kaasiit aap aeeng.
(translation:)
A: And didn't you come in the lorry?
B: yes, we didn't come in the lorry, we came on Tuesday.

In the English questions the negative in the response is extracted from and repeats
a portion of the question, but in the African questions the response indicates that the
question is taken to be of the general form: "is (not(S)) true?" The English question
presupposes the truth value of the questioned negative assertion, but the African sequence
does not, and rather, includes it in the domain of the question (c.f. Pope 1973).

This example is in fact typical of many of the differences between the English and
the African conversational materials. The English ones usually presuppose more (more
precisely, the speaker implicates the listener in more presuppositions than do the African
speakers).

Given the preferred mutual postural orientations mentioned previously, we may note
that the 'natural' spatial conversational arena for the two participants in a conversation
is in front of them and not between them for the English speakers. This has some very
interesting consequences, I believe, for deixis systems. In the African systems it follows
that the speaker's and listener's orientations are identical, but that in the English system,
speaker's and listener's points of view are not identical. Now consider how English speakers
describe the following situation: if there is an object, say a ball, between ourselves and
another object, say a table, we say that the ball is in front of the table. If the ball is
beyond the table, we say that it is behind the table. That is, in each case, we take the
point of view of the table in such a way that we assume it is 'facing' us (note that, as
discussed in a delightful paper by John Kimball (1968), tables and the like don't have faces
which are given in nature). In contrast, in each of the African languages discussed, the
ball would be described in the first instances as being behind the table and in the second
as being in front of the table. This is exactly the opposite of English usage! Speaking
metaphorically it is clear that African speakers do not assume a point of view for the
table which is opposite their own. Rather they assume that the table has a point of view
which is the same as theirs. This difference is exactly what we would expect on the basis
of the conversational behaviour.

Another point related to deixis: the linguist A.L. Becker has discussed the use of the
first person in English as a kind of unmarked point of reference, and contrasted this with
the use of the second person in politeness systems in a number of Southeast Asian languages.
He uses the term 'reverse deixis' for this phenomenon. For example, a letter might begin,
"How are things here?," where the "here" means, in our terms, "there". That is, the
addressee's point of view is taken (Becker 1979).[6]

With reference to body motion, Birdwhistell (1971) has observed that inwardly directed
pointing movements are associated with both the first person personal pronouns and with
the proximal demonstratives (this, these), while outwardly directed pointing movements
are associated with both third person pronouns and the distal demonstratives (that, those).

We may add to Birdwhistell's pronoun list the second person pronouns which also are associated with outwardly directed movements and note that the contrast is then first versus non-first person in association with proximal versus distal deixis (an additional argument in support of Becker's reverse deixis concept for English).

A striking difference between the African and the English conversations is that although the African languages have full repertoires of personal pronouns (including both bound and free forms), and although pointing movements are common in association with spatial deictics (which also are well-developed), pointing movements are not associated with pronominal reference.

Furthermore there is a difference in the way the pointing movements are used in the African conversations. Specific locations are pointed to, but there is not a regular and systematic use of a contrast between here/me and there/other. That is, the system is as often gradient as equipollent (in Trubetskoy's terminology).

Also, needless to say, there is no justification for the association of the 'meaning' of the proximal demonstrative with 'near to the speaker' and the medial demonstrative with "near to the listener" with these African languages. The terms have a primarily spatial reference in the first instance, and that spatial reference is to areas relatively near/away from both the speaker and the listener.

A point related to the preceding: it has been noted that American English speakers customarily converse at distances which are relatively far apart (with reference to Arabic or Latin American norms (Watson 1970). While I suspect that part of this has to do with the fairly major importance of interactional leg use in this culture (Sarles 1977), I think that part is also attributable to the use of the space between interactors in our culture. In African cultures this space need not be used in interaction, and so it doesn't matter if it is filled up (with the interactors' bodies). In fact it appears that in the three African cultures where I studied the effect of distance in detail experimentally (reported in Creider 1977), distance makes no difference whatever. There is a tendency to prefer a closed position when convenient, but a striking feature of the African scene is the huge distances over which people routinely carry on extended conversations.

A somewhat more abstract matter related to the previous discussions: there is an interesting contrast in the style of presentation of discursive arguments (and possibly of the conception of these arguments -- I do not believe that the conception of an argument is an event separate from its interactional realization). Spoken English conversations in my experience tend to utilize either-this-or-that type contrasts with great frequency in argumentation. The African conversations, however, routinely assume as an unmarked case that the number of arguments or facets or whatever of an issue exceeds two. This is typically given body motional realization by hooking the fingers of one hand over the individual fingers of the other hand as points are made.[7]

We have moved speculatively fairly far afield from our original starting point. Let me close with the following set of observations which brings us back to the beginning. We started out by noting that the African conversants did not make systematic use of interactional gaze behaviour, and in particular did not use it to provide listener feedback. This was in marked contrast to the usage patterns of English speakers. We may go further and note that there is a general tendency in the African interactional systems to orient to the spoken part of the conversation exclusively. This also is in marked contrast to the English systems, where a person's nonverbal behavior can be and often is oriented to, and where in fact a variety of disciplines have sprung up whose existence depends on the reality of this orientation. Regardless of its validity, Birdwhistell's off-quoted

statement that in "normal two person conversation, the verbal components carry less than 35% of the social meaning; more than 65% is carried on the nonverbal band,"[8] is one that can only be made in a culture where nonverbal behaviour is in fact a significant part of interpersonal interaction. Similarly the work on verbal deception, 'leakage', and in general the possibility of saying one thing with one's words and another with one's body which is done by psychologists studying nonverbal behaviour (e.g. Ekman and Friesen 1974), only makes sense in a culture such as ours which is oriented to nonverbal behavior.

In contrast the African cultures are rather singularly unoriented to the nonspoken word as an indicator of interactional meaning. Note that in the African cultures, interactors do find themselves in situations where for reasons of politeness and respect they must say one thing and perhaps mean another, and they are quite aware that this is something which they will encounter in the speech of others. But when it comes to detecting 'true' intentions, it is speech which is oriented to and not nonverbal behaviour.[9]

NOTES

[1] An earlier version of this paper appeared in 1980 as ERIC document ED 200 053. I am grateful to Dan Jorgensen for pointing me to the sources cited in note [7] and also for discussing many of the points in this paper with me. He is not responsible for any errors of representation or interpretation I make with respect to the New Guinea cultures.

[2] This is, I believe, one of the major significances of Sack's 1972 article on puns, and is also in Goodwin 1981.

[3] A low incidence of gaze use has been reported (without data) by Scheflen (1972) for Black North Americans, but with no understanding that this was a piece in a functioning interactional system which could be realized in other modes.

[4] A check on the number of morphemes per word for the Kipsigis conversation shows a figure of 1.77. This corresponds closely enough to Greenberg's (1960) 1.68 value for English that I haven't made any correction for this factor.

[5] Note that some interesting questions are located here. Dyadic conversations, with respect to the question of competition for the floor, are qualitatively different from triadic, etc. conversations. From the point of view of the listener, in a dyadic conversation the only 'competition' is current speaker, who occupies (it will be recalled from Sacks, Schegloff and Jefferson 1974) a privileged position in the turn-taking system. From the point of view of the speaker on the other hand, greater-than-dyadic conversations present special problems: first that of distinguishing between all-other directed utterances and specific-other directed utterances, and second that of maintaining the floor in a specific-other directed utterance against competition from 'other' others. Gaze is much more effective than verbal behaviour in these (greater-than-dyadic) situations because it is so much more highly directional and allows a speaker and selected listener to insulate themselves from others.

[6] What is possibly an extreme version of this is Telefol (New Guinea) 'indirect speech' (D. Jorgensen, pers. comm.) where "your friend is hungry" or "your friend departs" are found in place of "I'm hungry" and "I'm leaving." I do not know if this can be related to the off-noted Melanesian assertiveness (cf. Schieffelin 1975: 117-134). Occupying another's place (symbolically invading his body) is certainly open to that sort of interpretation.

[7] There is a further exploration to be made of interactional style and style of argumentation which requires a short detour to New Guinea. The cover of the third volume of Margaret Mead's The Mountain Arapesh (1971) shows two Arapesh standing face to

face blowing flutes. Williams (1930, cited in Schwimmer 1973:183) reports that in Orokaiva sacred flutes which are used in initiation ceremonies are played in pairs by two men facing one another. The flutes are played antiphonally (Schwimmer 1973:183), i.e. conversationally. The Orokaiva and the Arapesh have societies which are characterized by moiety divisions, intra-village feasting, village endogamy and restricted marriage exchange systems. There are other groups in New Guinea, however, which have exogamous communities, generalized marriage exchange systems, and inter-village feasting with chain-like sequences of ceremonial exchange. In at least two of these, the Gimi (Gillison 1977) and the Naugla (Nilles 1940), initiation flutes are played side-by-side and not in antiphonal fashion.

In the East African cultures I have studied flutes are not used ceremonially as far as I know, but singing is very clearly not antiphonal: it is responsorial and choral. Marriage systems are complex, moieties non-existent, etc., but what I find most striking about this comparison is the implication for political order that seems to be part of the face-to-face versus the side-by-side. The Orokaiva and Arapesh, etc. are characterized by 'big-men' -- a tendency to crystallize into opposing groups around leaders. With the Kipsigis and other African groups, one doesn't find this at all, but rather a system which is egalitarian in conception and gives to each member of the community the opportunity to be heard out and to participate in a consensual decision (Peristiany 1939).

8. This particular version is from Knapp (1972:12) who gives no specific reference.

9. This paper has been concerned with one kind of body movement, gaze, in one kind of context, conversation. It would not only be unwarranted, but it would be incorrect to generalize beyond these limits. In East Africa, Africans can (and in fact do so as a normal acitivity) identify individuals ethnically by gait, posture and other aspects of body movement and positioning. In addition there is a repertoire of gestures. These gestures often have lexical equivalents and may accompany such equivalents when uttered in conversation. Body movements also appear to have some function in regulating turn-taking and in preventing overlap. The last two types and functions of body movements are studied in Creider 1977 and 1978 respectively. The first type, social categorization, has not been studied, but it would be highly interesting to do so.

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RIVERS PIDGIN ENGLISH:
TONE, STRESS, OR PITCH-ACCENT LANGUAGE?

Nicholas Faraclas

This paper proposes an analysis in which Rivers Pidgin
English (RPE) is basically viewed as a stress-accent language.
In particular, the correlation of pitch patterns over words
(when considered in isolation) which have entered RPE from
stress dominant languages (such as English) with pitch patterns
found over corresponding words in the acrolect seems to charac-
terize RPE as a stress-accent language. It is argued here
that a stress analysis fails to account for the behavior of
pitch over word groups in connected speech. These words divide
themselves into phrases that bear one of two basic pitch melo-
dies which resemble words in many pitch-accent-dominant lan-
guages. An analysis of pitch in RPE in terms of pitch-accent
is seen to be inadequate in handling words that have entered
RPE from some tone-dominant basilectal languages such as
Yoruba. It is argued here that an analysis which incorporate
stress-accent, pitch-accent, and tone is necessary in account-
ing for patterns of pitch-related supra-segmentals found over
RPE utterances in a comprehensive and yet elegant way.

1.0 Introduction

1.1 Purpose and scope of study

This study represents an attempt to analyze all pitch-related
suprasegmental phenomena which occur over strings of natural speech
in a language which seems to resist easy classification under the tra-
ditional rubrics of 'tone language', 'pitch-accent language' or 'stress
language'. The goal of the analysis is both to describe the patterns
found in the data in the simplest and most general way without ignoring
patterns which may not fit very nicely into an extremely abbreviated,
streamlined interpretation, as well as to reflect the processes (uni-
versalor language-specific, diachronic or synchronic, pragmatic, morpho-
syntactic, etc.) which motivate the systems under consideration and
integrate them into a cognitive superstructure which can function as a
unitary whole.

1.2 Language situation and sociolinguistic history

Rivers Pidgin English is the dialect of West African Pidgin (or
Creole, see Hancock 1983) English (WACE) spoken by at least five million
people inhabiting the Rivers, Cross River, Imo, and Anambra states of
southeastern Nigeria, especially in the urban centers such as Port
Harcourt, Calabar, Aba, Owerri, Enugu, etc. The peoples of southeastern
Nigeria speak well over 60 clearly differentiated languages (which may
be subdivided into at least 200 distinct dialects) belonging to no less
than six separate subbranches of the Niger-Congo family of languages.

The various ethno-linguistic groups of southeastern Nigeria in general, and the Niger Delta in particular have traditionally maintained important relationships of exchange at all levels. Such relationships, especially those in the economic sphere (trading, etc.) would have required the acquisition by members of many different language groups of a common language to be used in the marketplace. Indeed, bi- and multi-lingualism are the norm rather than the exception in the Delta and such languages as Igbo and RPE have been used by Delta peoples as trade languages as well as to meet the other communication needs of people of diverse linguistic origins living together.

In the Delta, contact with traders from Europe has been long (dating from the 15th century) and sustained. Although the Portuguese, the Dutch, the French, the Germans, the Danish and others traded in the Delta, the English succeeded in establishing their hegemony over the area by the middle of the 19th century. Along with British colonialism came European education via missionaries, many of whom were Krio speakers from Sierra Leone (who were ex-slaves or descendants of 'repatriated' slaves from the Caribbean).

Whether RPE developed from the marketplace contact situation between European (primarily English) traders and traders of the various Delta ethnic groups or from the influence of missionaries from Sierra Leone remains undetermined. One must be careful not to overemphasize the role of either the traders or the missionaries in the evolution of RPE because, except at its earliest stages of development, the language has been used primarily as a means of communication among Delta peoples rather than between Delta peoples and traders, missionaries, or others from outside.

It is perhaps unfortuante, but in any case very misleading to have almost all of the West African piginized, creolized, and decreolized speech varieties in which English has played the role of acrolect or superstrate referred to as 'Pidgin' or 'Pidgin English' (Krio, luckily, was spared this inappropriate title). The RPE speech community as well as those of the languages resembling it (Cameroonian Pidgin English, other varieties of Nigerian Pidgin English, etc.) encompass the entire pidginization-creolization-decreolization continuum. For example, for a market woman from Eleme (in Rivers state) whose use of Pidgin is restricted to business transactions, RPE is a pidgin in the true sense of the word, but for her child who uses Pidgin with his playmates from Okrika in the market, RPE is a depidginized or creolizing speech form, rather than a true pidgin. For the Ikwere man who speaks Pidgin with his wife from Nembe and especially for his children, who speak Pidgin with their parents, RPE is not a pidgin at all, but a creole. For the child from Port Harcourt who grows up speaking Pidgin, but who hears Nigerian Standard English at home (on formal occasions) from his or her university educated parents, at school, and on the radio and television, RPE is in all probability a decreolized speech form.

The number of speakers of West African Creole English (RPE included) has increased dramatically since the Civil War (1968-1970), and it is without a doubt the most widely spoken language in Nigeria at present. As is the case with many pidgins and creoles, WACE and RPE are spoken with varying degrees of similarity to the acrolect (now Nigerian Standard English, Mafeni 1971) and/or to the basilects (Igbo, Efik, Ịjọ, etc.) according to both the competence of the individual speaker as well as to

the sociolinguistic context in which a given utterance occurs (Faraclas
et al. 1983). The number of people speaking RPE (often alongside one or
more other languages) from infancy is also increasing rapidly. The RPE
forms used in this work will be those typically used in casual settings
among speakers who learned the language early in life and who have con-
tinued to speak it on a daily basis.

While WACE is perhaps the most logical choice for a national language
for Nigeria in terms of the number and geographic distribution of speakers,
ease of learning for speakers of most Nigerian languages, ethnic 'neutality',
etc., it is almost unanimously considered by those responsible for the
formulation and implementation of language policy in Nigeria to be totally
unacceptable. Most Nigerians, however, including those with a perfect com-
mand of Standard English, prefer to use Pidgin instead of Standard English
in interethnic contexts on all but the most formal occasions. Pidgin is
the language used, for example, among university students from different
linguistic backgrounds outside of class. Pidgin is clearly the language
of solidarity in Nigerian society, but Standard English is the language
of prestige.

While the full exploitation of Pidgin as a means of mass communication
has not gone nearly as far in Nigeria as in other nations where the autho-
rities have adopted a more scientific and rational attitude towards cre-
olized speech forms (such as Papua New Guinea), some important steps have
nonetheless been taken at the local level to increase the use of Pidgin in
the media. Radio Rivers Two, the state controlled radio station in Port
Harcourt, now presents public service messages, commercial messages, and
newscasts in 'Special English' (RPE), while several very popular soap-
opera type series in WACE have run on state controlled television stations.

2.0 Pitch patterns in RPE

In Rivers Pidgin English we find such minimal pairs of words as (an
accute accent indicates high pitch, a grave accent indicates low pitch,
and an apostrophe precedes a stressed syllable):

a.	/gó/	'(to) go'	[à gó 'mákèt]	'I went to market.'
b.	/gò/	future marker	[à gò gó 'mákèt	'I will go to market.'
c.	/mɔ́da/	'mother (biological)'	['mɔ́dà]	
d.	/mɔ̀da/	'school marm'	['mɔ̀dá]	

Is the pitch distinction between the two members of each pair cited above
best analyzed as tonal (as in Gokana bá 'hand' vs. bà 'eat'), stress-
related (as in English 'import vs. im̄port), or part of a pitch-accent system
(as in Ijo aká 'tooth' vs. aká 'maize')? Some of the arguments for and
against each analysis are presented below.

2.1 Pitch as stress

When RPE words are considered in isolation, it becomes apparent that
the great majority (perhaps 85% - 90%) of words brought into the language
from languages with stress-dominant pitch patterns (i.e. Portuguese, English,
Spanish, etc.) bear a high (or, if word-final, falling) pitch over the
syllable which bears stress in the source language and carry low pitch over
the other syllables. Since most RPE words are English-derived, most of
them exhibit the pitch pattern just described. For expository purposes,

such words will be called <u>Group A</u> (stress-source) words in this work.
Examples (falling pitch is symbolized by ^. Orthographic representations
are those recommended by Faraclas et al. 1983):

    a. <u>fada</u>   [fádà]   'father'   d. <u>latrin</u> [làtrîn] 'latrine'
    b. <u>anoda</u> [ànódà]   'another' e. <u>pikin</u> [pìkîn] 'child' (Portuguese)
    c. <u>parabul</u> [páràbùl] 'parable' f. <u>panya</u> [ápñà] 'Spanish' (Spanish)

The pitch patterns described for Group A words seem to reflect productive
processes in RPE. Consider the following items of recent origin:

    a. <u>kondokta</u>   [kòndóktà]   'conductor'
    b. <u>drayva</u>   [drájvà]   'driver'
    c. <u>pitakwa</u>   [pìták^wà]   'Port Harcourt'
    d. <u>jagbajantis</u> [dzàgbàdzántìs] 'junk' (Ijo + English?)
    e. <u>ngwongwobiliti</u> [ŋg^wɔ̀ŋg^wɔbílìtì] 'likeability' (Igbo + English)

Another interesting parallel between stress patterns in English and
pitch patterns in RPE is the fact that words with a greater grammatical than
lexical function which are normally unstressed in English (i.e., non-focussed
subject pronouns, auxiliary verbs, prepositions, etc.) normally bear low
pitch in RPE.

Examples:

    a. <u>gò</u> [gò] future auxiliary   vs. <u>gó</u> 'to go'
    b. <u>fò</u> [fò] preposition   vs. <u>fó</u> 'four'
    c. <u>dèm</u> [dèm] 'they' (non-focussed) vs. <u>dếm</u> 'they' (focussed)

In many (but not all) stress languages, stress is signalled by
increased length and/or amplitude as well as by high or gliding pitch.
In RPE, high or gliding pitch are the only reliable cues marking the
syllables of Group A words which correspond to stressed syllables in
their source-language cognates. The exclusive use of pitch to signal
accentuation is more typical of pitch-accent languages than of stress
languages.

2.2 <u>Pitch as accent</u>

When not in isolation, the above outlined stress-like pitch patterns
over Group A words occur only at the end of what will be called <u>pitch phrases</u>
in this work. Pitch phrases in RPE are identical to the phrases over which
pitch-accent is assigned in such languages as Japanese (McCawley 1965) or
Ijo (Williamson 1966, Efere 1981). A pitch phrase normally consists of
(‖ symbolizes a pitch phrase boundary):

    a. a NON-AUXILIARY VERB or a NON-FOCUSSED SUBJECT OR OBJECT:

       i) ‖ wì go kari yam ‖ [‖ wì gò <u>kárí</u> jâm ‖]
            'We will carry yams.'

    b. an ADVERBIAL COMPLEMENT:

       ii) ‖ wì go kari yam ‖ fo tawn ‖ [‖ wì gò <u>kárí</u> jâm‖ fò tâwn ‖]
             'We will carry yams in town.'

c. a FOCUSSED NOUN PHRASE:

iii) ‖ wi‖wi go kari yam‖ fǫ tawn‖ [‖ <u>wì</u>‖wì gò <u>kárí</u> jâm‖fɔ̀ tâwn‖]
'As for us, we will carry yams in town.'

iv) ‖ wi go kari‖ yam‖ fǫ tawn ‖   [‖ wì gò <u>kárì</u> ‖ jâm‖fɔ̀ tâwn‖]
'We will carry <u>yams</u> (not cassava) in town.'

Notice that in the above examples, the verb <u>kari</u> bears two high pitches when
not in pitch phrase-final position. Only when <u>kari</u> occurs at the end of a
pitch phrase (or in isolation) does it bear the high-low pitch pattern which
corresponds to the stress pattern over the verb <u>carry</u> in English. All Group
A words carry high pitch over all syllables following the syllable which
corresponds to the stressed syllable in the source language, unless they
occur in pitch-phrase final position. Word final high pitches do not fa l
unless they are pitch phrase-final as well.

Examples:

· a. anǫda   [ànɔ́dà ‖]
           'another'
   b. wan   [wân ‖]
           'one'
   c. giv mi anoda wan   [gív mì ànɔ́dà wân‖]
           'Give me another one.'
   d. dem de layk wan anǫda   [dɛ̀m dè lájk wán ànɔ́dà ‖]
           'They like each other.'
       pikin   [pìkîn ‖]
           'child'
       gud   [gûd ‖]
           'good'
       gud pikin   [gúd pìkîn ‖]
           'good children'
       pikin gud   [pìkín gûd ‖]
           'Children are good.'

The 10 - 15% of words brought from stress-dominant languages into RPE
whose pitch patterns do not correspond to those found over their counter-
parts in the source langauge (even preceding pitch phrase boundaries) di-
vides into two groups, which will be called Group B words and Group C words
in this work. Group B words simply carry more than one high pitch.

Examples:

   a) <u>wuman</u>   [wúmân ‖]   'woman'
   b) <u>animal</u>   [áním̂âl ‖]   'animal'
   c) <u>stanop</u>   [stánɔ̂p ‖]   'stand'
   d) <u>mochwari</u>   [mɔ́tʃwárì ‖]   'ice-fish'
       [‖ dì wúmán stánɔ̂p ‖ ʧɔ́p mɔ́tʃwárí sûp‖] 'The woman stood eating
                                                     ice-fish soup.'

Since the membership of a given word in Group A vs. Group B cannot be
predicted, some system of marking the distinction between the two groups is nec-
essary in phonemic representations. The need to mark distinctions between
stress-dominant source language words with differing pitch patterns becomes
imperative when Group C words are considered.

Examples:

a) GROUP A: [mɔ́dà] 'mother' vs.   GROUP C: [mɔ̀dá] 'school mother'
b) GROUP A: [sʃstà] 'sister' vs.   GROUP C: [sìstá] 'nurse'

Non pitch phrase-final Group C words carry low pitch over all syllables.
In pitch phrase-final position, the final syllable of a Group C word bears
high pitch which never falls. Monosyllabic words of this group bear rising
pitch.

Examples:

a) wota   [wɔ̀tá]   'water'
b) sabi   [sàbʃ]   'know'
c) kruman sabi wota   [‖ krúmán sàbì wɔ̀tá ‖]   'Sailors know the water.'
d) wota sabi kil pesin [‖ wɔ̀tà sàbʃ ‖ kʃl pésìn ‖] 'Water can kill you.'

   Poser (1984) cites the fact that Japanese exhibits a limited number of
pitch patterns compared to the possible number of pitch patterns (given the
basic levels of pitch realized over utterances) as the primary criterion
for classifying it as a pitch-accent system, rather than as a tonal system.
Similar criteria are defined by Kingston (1983) for Bantu pitch systems.
As shown above, words in RPE from stress-dominant source languages bear only
a small number of the pitch patterns which might occur over them, even in a
system with only two distinctive levels of pitch. In Ịjọ (Williamson 1966,
Efere 1981) four classes of nouns exist, each having a different pitch melody
associated with it. A pitch-accent account for the behavior of stress-source
words in RPE might posit the following classes and rules:

a) CLASS 1 - NON-FINAL ACCENT: anóda   [ànɔ́dà ‖] 'another'
b) CLASS 2 - FINAL ACCENT: pikʃn   [pʃkìn‖]   'child'
c) CLASS 3 - ZERO ACCENT: wota   [wɔ̀tá ‖]   'water'

   CONDITION 1: AN ACCENT IS ASSOCIATED WITH RIGHT BOUNDARY OF PITCH PHRASE.
   CONDITION 2: ACCENTS ARE ASSIGNED HIGH PITCH.
   RULE 1:   NON-PHRASE FINAL WORDS--HIGH PITCH SPREADS RIGHTWARD.
   RULE 2:   PHRASE BOUNDARY ACCENT → LOW PITCH AFTER AN ACCENT-BEARING
                 WORD (CLASSES 1 and 2).
   RULE 3:   IF NO SYLLABLE INTERVENES, WORD AND PHRASE ACCENTS FUSE.
   RULE 4:   IF PHRASE FINAL WORD IS ACCENTLESS, PHRASE FINAL ACCENT
                 IS ASSOCIATED WITH FINAL SYLLABLE.
   RULE 5:   ALL REMAINING SYLLABLES BEAR LOW PITCH.

Sample derivations based on the above rules:

	CL. 1:	/anɔda/	/anɔda ‖ /	CL. 2:	/pikʃn/	/pikʃn‖/	CL. 3:	/wota/	wota‖/
COND. 1:		anɔda	anɔda‖		pikʃn	pikʃn‖		wota	wota‖
COND. 2:		anɔda	anɔda‖		pikʃn	pikʃn‖		wota	wota‖
RULE 1:		anɔdá	--		--	--		--	--
RULE 2:		--	anɔda‖		--	pikʃn‖		--	--
RULE 3:		--	--		--	pikʃn‖		--	--
RULE 4:		--	--		--	--		--	wotá‖
RULE 5:		[ànɔ́dà]	[ànɔ́dà‖]		[pìkʃn]	[pìkʃn‖]		[wɔ̀tà]	[wɔ̀tá‖]

While the pitch-accent system outlined above accounts for almost all occurrences of words from stress-dominant languages, it does not account for certain reduplicated forms, where a rising pitch melody spreads over the entire word.

Examples:

a) waka [wàká‖] 'walk'   wakawaka [wàkàwáká‖] 'constant moving about'
b) hala [hálà‖] 'yell'   halanala [hàlàhálá‖] 'constant yelling'

More importantly, however, most of the words brought into RPE from non-stress-dominant languages (i.e., languages with strong tonal or pitch-accent systems) cannot be accounted for by the pitch-accent system posited for stress-words above.

2.3 Pitch as tone

Class D words. Class D or non-stress dominant source language words may bear almost any possible combination of two level pitches (high and low) and are not sensitive to the accent- or stress-like pitch phenomena associated with pitch phrase boundaries which have been outlined above. There is therefore no logical reason not to analyze pitch patterns occurring over Class D words tonally.

Examples:

a) akǫm   BUT   [‖ ákɔ̀m‖] < IGBO   'fever'
   akǫm shotǫp   [‖ ákɔ̀m ʃɔ́tɔ̀p‖]   'malaria medicine'
b) loyloy   invariably [‖ lɔ́jlɔ́j‖] (YORUBA?)'specially pounded cassava'
c) ajagarana - okpokpo invariably [ádʒágáráná òkpòkpò‖]< IJǪ 'junk'

As shown in section 2.2, however, full specification of pitch over every syllable is not necessary underlyingly for most words in RPE.

3.0 RPE as a mixed tone-accent-stress language

There are clearly two sets of lexical items in RPE; one set which is underspecified for pitch underlyingly (Classes A, B, and C) and which allows phrase-level accentuation to partially determine surface pitch patterns, and another set (Class D) which is fully specified for pitch underlyingly and is not affected by phrase-level accentuation. What is the simplest account we can give of the behavior of both of these sets of words with respect to pitch which captures all of their similarities while ignoring none of their differences?

3.1 Evidence in support of a mixed system

Since non-stress-source items need to be fully specified for tone as part of a two level tonal system, we must posit two tonemes, high (′) and low (`). These tonemes may be used, however, to account for the behavior of stress-source words in a simpler yet more adquate way than the pitch-accent system proposed in section 2.2 above, using the following conditions and rules; which apply to forms underspecified for tone underlyingly:

COND. 1: ASSIGN HIGH TONE TO ALL STRESS SOURCE GROUP A & B
          SYLLABLES THAT OTHERWISE WOULD CARRY PITCH-ACCENT.
COND. 2: ASSIGN LOW TONE TO THE FINAL SYLLABLE OF STRESS-SOURCE
          GROUP C WORDS WHICH WOULD NORMALLY CARRY LOW PITCH PHRASE
          FINALLY.
RULE 1:   PHRASE FINAL TONES BECOME GLIDES: HIGH→ FALL, LOW→ RISE.
RULE 2:   IF A SYLLABLE BEARING A GLIDING TONE IS FOLLOWED BY A
          SYLLABLE UNSPECIFIED FOR TONE, THE FINAL ELEMENT OF THE
          GLIDE SEPARATES FROM THE INITIAL ELEMENT AND MOVES RIGHT-
          WARD ONTO THAT SYLLABLE.
RULE 3:   IF A TONE-BEARING SYLLABLE IS FOLLOWED BY ANY NUMBER OF
          NON-TONE-BEARING SYLLABLES, ITS TONE IS COPIED ONTO ALL
          OF THEM.
RULE 4:   ALL OTHER SYLLABLES BEAR LOW TONE.

	H	H ⌐STR	H H	H H⌐STR	L	L⌐STR
COND. 1 & 2	/anɔda/	/anɔda‖/	/ánimál/	/animál‖/	/wɔta/	/wɔta‖/
		HL		H HL		LH
RULE 1	---	anɔda‖	---	animal‖	--	wɔta‖
		HL				LH
RULE 2	---	anɔda‖	---	---	--	wɔta‖
	H		H H	H HL	L	
RULE 3	anɔda	---	ánimal	ánimal	wɔta	--
	L H H	L H L				
RULE 4	anɔda	anɔda‖	---	---	--	--

SURFACE FORM [ànɔdà] [ànɔdà‖] [ánímál] [ánímâl‖] [wɔtà] [wɔtá‖]

Note that this account also handles reduplicated forms (which could not be
dealt with using the pitch-accent model; see 2.2 above) if they are assigned
a single low tone.

Example:

	L⌐STR
COND. 1 & 2	/wakàwaka‖/
	LH
RULE 1	wakàwaka‖
	LH
RULE 2	wakàwàka‖
	L H
RULE 3	wakàwàka‖
	L L H H
RULE 4	wakàwàka‖
SURFACE FORM	[wàkàwáká‖]

3.2 Conclusions and theoretical implications

The only satisfactory solution to the problem posed by pitch in RPE,
that is, the only analysis that can predict pitch patterns over utterances
in a unified way involves the interaction of tonal, pitch-accent, and stress
units. Tone is assigned to words lexically, words from tonal languages being
fully specified (one tone per syllable) and words from English being under-
specified in most cases (often one tone per word). Underspecified items would

then be assigned additional pitches on the basis of their position within a stress-accent group or phrase as well as in relation to the type of tone assigned to them lexically. The existence of a mixed system of pitch assignment and realization in RPE reflects the mixed origins of the language which include stress languages (English, Portuguese) tonal languages (Igbo, Yoruba, etc.) and pitch-accent languages (Ịjọ). At the surface, one is tempted to apply a stress analysis but the actual system is in many ways a reinterpretation of stress in terms of tone and pitch-accent. (A parallel case of reinterpretation (in the opposite direction) has been described by Li (1984) for Baonan, a Sino-Turkic creole spoken in north-central China.)

The RPE data re-affirms the importance of substrate-basilectal speech patterns on the underlying structures and processes in pidgins and creoles. In also indicates that speakers of pidgins and creoles operate from unified systems rather than from a loosely bound set of parasystems, each corresponding to the system as it exists in one or another of the input languages. In other words, a pidgin or a creole may behave at the surface in a way which is very much like the acrolect and perhaps very much unlike the basilect. A more careful analysis usually results in the discovery that the strategies used by speakers in the production and processing of surface forms are strikingly similar to those typical of basilect, rather than acrolect speakers.

Linguists are only now coming to recognize the importance of processes such as pidginization/creolization in the devlopment of all languages. One of the implications of this realization will have to be the recognition of the possibility that mixed systems like the one outlined for RPE above are not restricted to languages generally classified as pidgins or creoles but may in fact be quite widespread and that such mixed systems, where they do exist, function as unified systems rather than as sets of parasystems. This may explain the recent successes of the autosegmental model, which in effect is supple enough to at least begin to accommodate itself to the analysis of systems which have both tonal and accentual characteristics.

There seems to have been a certain reluctance on the part of many Africanists to even consider the existence of any non-tonal pitch phenomena in the languages that they study. It is obvious that such attitudes can do nothing to advance, but much to hinder the scientific description and analysis of African languages. In many parts of Africa intermarriage, bi- and multilingualism, and other forms of interethnic contact and exchange are the rule rather than the exception. The traditional bias in linguistics against pidginization/creolization as a model for language change has had for this reason even more of a negative impact on the study of African languages than it has had in other areas. Africanists must learn to recognize, describe, and analyze mixed systems wherever they occur. Mixed systems can in fact shed much light on some unresolved questions facing the linguist in Africa. For example, the analysis of RPE pitch patterns as the result of a mixed system has allowed the division of lexical items into distinct classes, each of which corresponds to a particular historical state or source of borrowing of vocabulary items into the language. Class A words appear to have been brought into RPE directly from British and, later, Nigerian dialects of Standard English. Class C words reflect pitch patterns commonly found in Sierra Leonian Krio (Fyle and Jones 1980) and were probably introduced by Krio speakers during the late 19th century. Class B words

often seem to be the result of an old compounding process which has been
replaced by the still productive Class A compounding pattern (as in 2.1
above) on one hand, and by low-toned reduplication (see Section 3.1 above)
on the other. Class D words are clearly borrowings from other Nigerian
languages and appear to be increasing in number along with the rise of
nationalism in the post-colonial era.

     In comparison with some of the neighboring dialects of West African
Pidgin English (especially the Benin City-Warri-Sapele dialect to the west
and the Cameroonian dialects to the east), Rivers Pidgin English appears
to have undergone a limited but nonetheless significant process of decre-
olization. For example, many words which have final consonant clusters
in RPE and Standard English have single final consonants in other dialects.
Voiced plosives also occur word finally in RPE as in Standard English,
where voiceless plosives occur in neighboring Pidgin speaking communities.
In general, however, RPE phonology does not differ much from what has been
reported for other Nigerian and Cameroonian dialects of West African Pidgin
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RELATIVE CLAUSES IN STANDARD ARABIC
REVISITED*

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The phenomenon of relative clause formation (RCF)
in Arabic, as discussed by Anshen and Schreiber (1968),
Lewkowicz (1971), and Killean (1972) will be reexamined.
This paper will argue that (1) RCF in Arabic is a movement
rule which consists of: (A) relative pronominalization of
the NP in the embedded clause, and (B) relative pronominal
fronting into the head position of the relative clause; (2)
Case assignment is a post cyclic rule; and (3) Grammatical
agreement in Arabic is a crucial phenomenon in accounting
for language facts. In conclusion, the paper will briefly
discuss the theoretical implications of the study and sug-
gest other types of relative clauses for further investi-
gation.

1.0 INTRODUCTION

It has been suggested in three recent studies (Anshen & Schreiber 1968;
Lewkowicz 1971; Killean 1972) in the transformational literature that rela-
tive clauses in Standard Arabic (hereafter Arabic) are uncomplicated struc-
tures that can be derived from topic-comment sentences by applying some sort
of a copying-deletion rule. These studies reject a movement and pronominal-
ization analysis of relative clauses in this language by arguing essentially
that Arabic does not have true relative pronouns, but uses instead a so-
called "special form of the definite article" (Lewkowicz 1971:819). This
special form of the definite article is alladi. We will attempt to show
here that these analyses are erroneous.

The objective of this study is to propose an alternative analysis of
relative clause in Arabic that will provide a better characterization of the
phenomenon of relativization in the language. It will be shown here that
the above mentioned studies were based on an erroneous analysis of Arabic
basic sentence structure and on a limited sample of relative clause con-
structions. This paper examines several types of relative clauses, and pro-
poses an analysis within the framework of EST that views relativization in
this language as involving two basic rules: relative pronominalization and
NP-movement. Several arguments are given in support of this analysis, and
counter-examples are presented against the topic-comment approach.

2.0 OVERVIEW OF EARLIER STUDIES

Arabic has relative clauses such as (1) and (2) below where the former
exemplifies subject relativization and the latter object relativization:

(1) ?al-waladu alladi maata abuhu. [1]

the boy   who   died   father his
(The boy whose father died.)

(2) ?at-ta9aamu alladi ?akala-hu al-waladu. [2]

the food   which   ate   it the boy
(The food which the boy ate.)

Two main approaches have been suggested in several studies to account for data like (1) and (2). These are the "topic-comment" analysis and the "deletion" analysis. In this section, I present an overview of these studies and discuss their weaknesses.

2.1 <u>Topic-Comment Approach</u>. The first publication in transformational grammar to deal with RCF in Arabic was Anshen and Schreiber (1968). Anshen and Schreiber assume that Arabic is a SVO language. Their assumption is based on evidence from verbal agreement. The authors state that "any noun in a sentence, other than the first member of a construct phrase, may optionally be reproduced at the beginning of the sentence" (Anshen & Schreiber 1968:795). The occurrence of such a noun at a sentence initial position is accounted for by the following "focus-transformation" rule which is optional:

(3) $X - NP - Y \rightarrow NP^1 - X - NP - Y$

where $NP = NP^1$ and NP is not the first
member of the construct phrase

Consider the following examples from their study (Anshen & Schreiber 1968: 795-96):

(4) zaara ?al-binta ar-rajulu.

visited the girl the man
(The man visited the girl.)

(5) ?al-binta zaara-haa arrajulu.

the-girl   visited-her the man
(The man visited the girl.)

Sentence (4) above is the result of the application of the T. focus rule which copied the noun <u>?albinta</u> to the beginning of the sentence where pronominalization applied on the basis of coreferentiality.

Anshen and Schreiber also claim that the agreement on the verb in Arabic is not number agreement, but rather, a form which the pronoun in the nominative case takes when it is adjacent to the verb. This claim is used to argue for the existence of the optionally reproduced noun as in (5) above. This analysis, in their view, simplifies the formation of relative clauses.

A second study, using essentially the same analysis, appeared in 1971. In this paper, Lewkowicz suggests that relative clauses in Arabic are "de-

rived from underlying comment which could be assigned the structure NP#S#, resulting in the comment within comment structure" (Lewkowicz 1971:815). To clarify this, I will use the same example that Lewkowicz gave in her paper:

(6) walad-un maata abu-hu.

boy a died father-his
(A boy's father died.)

(7) al-waladu maata abu-al-waladi.

the-boy died father-the-boy
(The boy's father died.)

According to Lewkowicz, sentence (7) is first embedded in sentence (6), then undergoes the process of relativization producing sentence (8):

(8) al-waladu alladi maata abu-hu.

the-boy who died father-his
(The boy whose father died.)

Lewkowicz also claims that the relative pronoun _alladi_ is inserted before the relative clause "though this insertion might be better handled by regarding _alladi_ as a special form of the definite article" (1971:819). The author does not give any indication as to the source of the relative pronoun. Her argument draws only on the occurrence of the relative pronoun _alladi_ after a definite NP.

About a year later, Killean (1972) published a paper in which she supports Lewkowicz's analysis. According to Killean, the order of relative clause formation processes is as follows:

"(1) Topic-comment extraposition in S1 with simultaneous replacive pronoun formation or, if not simultaneous, at least before the boundaries are erased. (2) Embedding of this topic-comment into a higher NP. (3) If the embedding of 2 is well formed, i.e. if the two left-most NP nodes are non distinct, the formation of a relative pronoun out of the definite article _L_ plus -_adi_, -_ati_, or, -_adiina_ (based on gender-number concord) takes place. (4) The assignment of case at the sentence level follows this last transformation" (1972:148).

2.2 _Deletion Analysis_. While Lewkowicz accepts the topic-comment analysis mutually proposed by Anshen and Schreiber, her analysis differs from theirs in important respects. For example, she assumes a copying-deletion rule as presented in (9) below. According to this rule, relative clauses are formed by the deletion of a coreferential NP and the insertion of a form of the relative pronoun.

$$(9) \quad S \quad \left[NP_i \left[\begin{array}{ccccccc} NP & - & X & - & VP & - & Y \end{array} \right] \right]$$
$$S_1$$

$$1 \qquad 2 \qquad 3 \qquad 4 \qquad 5 \quad \rightarrow \quad 1 \quad wh \quad \emptyset \quad 3 \ 4 \ 5$$

where $NP_1 = NP_2$

The analysis proposed by Lewkowicz was accepted by Killean (1972), however, Killean was critical of the data Lewkowicz uses as being rare or barely acceptable by native speakers of Arabic. Other studies on Arabic RCF (Awwad 1973; Suaieh 1980) have partially accepted the analysis of Lewkowicz (1971). According to Awwad, the comment within comment approach proposed by Lewkowicz has failed to account for the source of the relative pronoun. Hence, Awwad proposes a modified rule of RCF in Arabic as shown in (10):

$$(10) \quad X - \left[\begin{array}{c} NP \end{array} \right. \left[\begin{array}{ccccc} X & - & NP & - & Y \end{array} \right]_S \left. \right]_{NP} - Z$$
$$ NP$$

$$1 \qquad 2 \qquad 3 \quad 4 \quad 5 \qquad\qquad 6 \quad \rightarrow \quad \text{oblig.}$$

$$1 \ 2 \ 4 \quad \# \ 3 \ 4 \ 5 \ \# \ 6$$
$$ \begin{bmatrix} +rel \\ +pro \end{bmatrix}$$

Condition $2 = 4$

2.3. <u>Problems</u>. The analyses summarized above are inadequate in many respects and fail to account for many relative clause constructions in Arabic. Let us consider these inadequacies or problems briefly in turn.

First, the T. focus transformation proposed by Anshen and Schreiber (1968) permits only the first NP, "which is not the first member of a construct phrase" (1968:795), to be preposed or moved to sentence initial position. Thus, in a sentence where the order is VSO and the NP to be relativized is the object, the T. focus rule will reproduce the subject NP which will require an adhoc rule to delete it, or, the formulation of another rule which will change the order of relations within the phrase so that the NP to be relativized will be promoted into the position of the "reproducable" NP. The T. focus transformation also will not account for relativization in oblique positions since the relativized NP is part of a PP, and Arabic allows such relativization to take place as will be shown later (ex. section 3.3).

Second, the hypothesis that the structure underlying relative clauses in Arabic is a topic-comment structure (Lewkowicz 1971; Killean 1972) is factually erroneous, because Lewkowicz has based her analysis on sentences which are ungrammatical and cannot be generated by Arabic grammar. Further, the comment within comment analysis where the embedded comment is the source for relativization is equally erroneous. Such an analysis will generate a new <u>topic</u> as in (11c) below which will somehow be deleted later in the analysis without any indication that it is recoverable. Consider, for example, sentence (11d) in relation to (11a-c), as given in Lewkowicz (1971:820):

(11) a. walad-un maata abu-hu.

boy a died father-his
(A boy whose father died.)

b. al-walad-u maata abu-al-walad-i.

the-boy died father-the-boy
(The boy whose father died.)

c. waladun al-waladu maata abu-hu.

boy a the-boy died father-his
(A boy whose father died.)

d. alwaladu alladi maata abu-hu.

the boy who died father-his
(The boy whose father died.)

According to Lewkowicz, sentence (11b) is embedded in (11a); then it under-
goes the process of relativization to produce (11c) where there are two
topics for the sentence: waladun, alwaladu. The topic of (11c) then is
deleted by some kind of a rule according to Lewkowicz (1971:820), result-
ing in (11d) above. This analysis complicates unnecessarily the grammar of
Arabic.

Third, the topic-comment analysis fails to account for the source of
the relative pronoun alladi. The morpheme alladi cannot be considered a
special form of the definite article as Lewkowicz (1971) claims, or, a var-
iant of the definite article as Killean (1972) suggests, because it is not
substitutable with the definite article al, as the ungrammaticality of sen-
tence (12b) attests:

(12) a. jaa?a al-waziiru al-širriiru.

came the-minister the-evil
(The evil minister came.)

b. *jaa?a al-waziiru alladi širriiru

came the-minister who evil

The article al is not a reduced form of alladi, but rather, it is a marker
of definiteness. Sentence (12b) requires the presence of the independent
resumptive pronoun huwa (he) to be grammatical as in:

c. jaa?a al-waziiru alladi huwa širriiru

came the-minister who he evil

The failure of Lewkowicz's and Killean's accounts of the relative pronoun
alladi has been correctly observed by Awwad (1973). This author argues
that alladi is an NP in the embedded sentence being copied to the front po-
sition of the relative clause, and on the basis of coreferentiality with the
head, it is realized as a relative pronoun.

Fourthly and finally, while the copying and pronominalization analysis correctly characterizes <u>alladi</u> as a relative pronoun resulting from rule (9) or (10), it also fails to explain one important property of relative clauses in this language: grammatical agreement. For example, the relative pronoun <u>alladi</u> takes case marking depending on the relativized NP. Consider the following examples:

(13) a. al-muaddaf-<u>aani</u> allad-<u>aani</u> qaabalahumaa al-mudiir tarakaa.

     the employee two who two   met-them   the director left
               nom   nom

    (The two employees who the director met left.)

b. qaabal-tu al-?ustaad-<u>ayni</u> allad-<u>ayni</u> zaar-aa al-jami9ah.

    met-I   the teachers two who two visited the university
                   acc   acc

    (I met the teachers who visited the university.)

Notice that the relative pronoun <u>alladi</u> is inflected for the nominative in (13a) and for the accusative in (13b), whereas the relativized site is quite the opposite in both 13 (a) and (b) as exemplified in (c) and (d), respectively:

c. $\Big[$ al-muaddaf-<u>aani</u> $\Big[$qaabala al-mudiiru al-muaddaf-<u>ayni</u>$\Big]$tarkaa. $\Big]$

      the-employee $\Big[$two$\Big]$ met   the-director the-employee $\Big[$two$\Big]$ left
              nom   acc

d. $\Big[$ qaabal-tu al-?ustaad-<u>ayni</u>$\Big[$ zaara al ?ustaad-<u>aani</u> al-jami9ah. $\Big]\Big]$

                             visited the teacher $\Big[$two$\Big]$
                                           nom

It is obvious that grammatical agreement changes according to the relativized NP. The question to be addressed here is, how can grammatical agreement be explained by copying-deletion analysis? Needless to say, there are other problems of this type that the copying-deletion analysis failed to account for. These problems, as I will argue, can only be resolved by assuming a movement type of analysis for Arabic relative clause formation.

3.0. THE ARABIC SENTENCE STRUCTURE AND RCF REVISITED

Since the above-discussed approaches have failed to recognize the source of relative clauses by adopting a topic-comment type of structure, we propose as an alternative that the basic sentence structure in Arabic is the source for relative clause formation.

3.1 <u>The Arabic Sentence Structure</u>. In this paper, I assume that the basic sentence types are the sources for RCF. There are two types of sentence structure in Arabic: (1) Nominal clauses, and (2) Non-nominal clauses.

This section summarizes the sentence structure of Arabic and other characteristics which will facilitate the description of RCF in section (3.3).

Nominal clauses consist of nominal equational and nominal non-equational clauses. The former typically include an NP followed by an adjective, adverb, or, a preposition phrase.

(14)   NP   + $\begin{bmatrix} \text{adj.} \\ \text{adv.} \\ \text{p.p.} \end{bmatrix}$

Examples of this structure are given in (15):

(15) a. alwaladu   fi-d-daari.

the boy   in-the-house
(The boy is at home)

b. Mohammadun   qaa?id-un. [3]

Mohammadun   leader-a
(Mohammadun is a leader.)

c. al-waladu   hunaak.

the boy   there
(The boy is there.)

Nominal non-equational clauses, in contrast, include an NP followed by a VP (NP) (PP) (ADV), as exemplified in (16):

(16) al-waladu   dahaba   ?ila-l-bayt.

the-boy   went   to   the-house
(The boy went home.)

Non-nominal clauses have been traditionally referred to as "verbal sentences" by Arab grammarians, and represent the basic word order in Arabic, VSO:

(17) ?akala   alwaladu   at-t9aama.

ate   the boy   the food
(The boy ate the food.)

(18) zaara   at-tullaabu   al-mathafa   al-wataniya.

visited the-students the museum the national
(The students visited the national museum.)

Verbal sentences in Arabic differ from nominal sentences in that they represent the unmarked word order. Although the subject in (17) is singular and in (18) plural, one could realize that the agreement on the verbs is the same. However, this is not the case in nominal non-equational sentences. Further discussion is presented in section (3.2).

3.2 Grammatical Characteristics of Simple Sentences. There are two genders in Arabic: masculine and feminine. The former is indicated by zero suffix, while the latter by -at. For example:

(19) a. dahaba al-mudiiru ?ila-l-?ijtimaa9.

        went   the director to the meeting
        (The director went to the meeting.)

    b. dahab-at al-mudiiratu ?ila-l-?ijtimaa9.

        went(f) the director(f) to the meeting
        (The director went to the meeting.)

Grammatical relations and agreement in Arabic are indicated by morphological
changes on nouns and verbs as well; as a result, Arabic allows free word or-
der (Bakir 1980). Perceptual complexity is resolved by case marking. Arabic
distinguishes three types of cases: nominative, accusative, and genitive.
Let us examine each of these briefly.

    The nominative case is always assigned to NP in the subject position
and it is indicated by the final -u mode marker, irrespective of the gender.
The word alwalad-u 'the boy', for example, in (20a) is always recognized as
a subject because of the nominative case assigned to it.

(20) a. jaa?a alwalad-u.

        came   the-boy-nom
        (The boy came.)

    b. zaara al-bint-a ar-rajul-u.   [4]

        visited the-girl   the man
        (The man visited the girl.)

The accusative case in Arabic is indicated by the -a suffix marker assigned
to objects. Notice that the word al-bint-a 'the girl' in (20b) is inflected
for the accusative, and hence, it is the object. The case marking for the
genitive is -i; for example:

    c. dahaba ?at-taalib-u ?ila-l-madrasat-i.

        went   the-pupil   to the school-gen
        (The pupil went to school.)

Agreement between the verb and its arguments depends on the word order in
the sentence. If the ordering is SVO, then the verb must agree with the sub-
ject in number and gender as exemplified in (21a-d):

(21) a. ?at-taalib-u dahaba ?ila-l-madrasat-i.

        the pupil-nom went   to-the-school-gen

    b. ?at-tullaab-u dahab-uu ?ila-l-madrasati.

        the pupils-nom went-pl   to-the-school
                (m)

    c. ?at-taalibaa-tu dahab-na ?ila-l-madrasat-i.

        the pupils(f)   went-pl   to the school-gen

d. ?at-taalib-aani dahab-aa ?ila-l-madrasati

   the pupils-two   went-two to the-school
       (nom)

However, if the verb precedes the expressed subject, then the verb is in the singular form, and agreement is required only in gender. For example:

(22) a. dahab-at at-taalibaatu ?ila-l-madrasati.

     went(f) the-pupils-pl(f) to-the-school

   b. dahaba at-taalibaani ?ila-l-madrasati.

     went Ø the-pupil-two   to-the-school
              (m)

The following conclusions can be drawn from the examples in (20) through (22): First, case agreement is a basic property of Arabic. Second, this type of agreement is noun governed as should be expected from case marked languages. And third, VSO represents the unmarked word order. These properties are crucial for any analysis of RCF in Arabic; any analysis that fails to take them into account cannot adequately explain the facts of relativization in this language.

    3.3 The Structure of the Relative Clause. As in many other languages, Arabic allows relativization in subject, object, and oblique positions. In this section, I consider different types of relative clauses, and discuss the interaction of RCF with grammatical agreement. The data examined argue against a topic-comment analysis and a copying-deletion analysis.

    3.3.1 Subject Relativization. Subject relativization in Arabic exhibits a number of syntactic and morphological properties. Consider, for example, the following sentence:

(23) a. al-walad-u alladi daraba al-bint-a saafara.

     the-boy-nom who   hit   the-girl-acc left
     (The boy who hit the girl left.)

This sentence has the structure S + S which consists of the clauses:

   b. ?al-walad-u saafara

     the boy   left

   c. daraba al-walad-u al-binta-a
     hit   the-boy-nom the-girl-acc

Clause (b) is a nominal sentence where the NP alwaladu precedes the VP saafara, and in this case, agreement is required, as explained in (3.2). In Arabic, subject-verb agreement for the third person singular masculine is marked by zero suffix; this explains the fact that in both (b) and (c) the agreement is zero though each clause has a different word order. Sentence (23a) is clearly an embedding of both 23 (b) and (c). Notice that

the subject of (23c) alwaladu, which is embedded in (23b), is no longer there, rather we have a relative pronoun materialized in the head position of the relative clause.

The question that comes to mind here is, how can these facts be analyzed? Before answering this question, it should be pointed out that the relative pronoun in Arabic for the masculine and feminine singular, alladi and allati, respectively, is invariable, and hence, we might not be able to tell clearly what actually took place. It could be explained as a deletion of NP in the embedded clause (23c) and insertion of the form alladi, or, it could be a relativization of the NP in the embedded clause which is realized as a relative pronoun being moved later to the front position in the higher clause. Either analysis at this point would account for the facts.

To select the best analysis, however, additional data must be considered:

(24) a. ḥadarat al-bintaani allataani daraba-humaa al-waladu.
        came   the girls(two) who   hit-them   the-boy
        (The girls who(m) the boy hit came.)

b. ⎡ ḥadarat al-bint-aani ⎡daraba al-walad-u al-bint-ayni.⎤⎤
      came   the-girl-two ⎢hit   the-boy-nom the-girl-two⎢
                 (nom) ⎣   (acc)⎦

Sentence (24a) consists of two clauses, the main clause and the embedded clause, as shown in (24b). Notice that the NP albintayni in the embedded clause is the object and is accordingly inflected for the accusative, whereas, the NP albintaani in the main clause is the subject and inflected for the nominative. After the application of relativization to the structure (24c), we get (24d),

c. ⎡ḥadarat al-bint ⎡daraba al-walad allat.⎤⎤
             +nom⎤ ⎢   +acc⎤⎢
             +dual⎦ ⎣   +dual⎦

d. ⎡ḥadarat al-bint allat darab alwalad-humaa.⎤
             +nom⎤ +nom⎤
             +dual⎦ +dual⎦

The relative pronominal in the embedded clause in (24c) is in the accusative (allatayni), and in (24d) this relative pronominal is assigned a nominative case marker allataani.

How can these morphological changes be accounted for? Evidently, such a change can only be explained by suggesting that RCF in Arabic involves a movement rule which moves the relative pronoun allataani in (24c) from the lower embedded clause to the main clause. It also suggests that case assignment applies after such movement has taken place on the basis of the new position it occupies in the sentence resulting in (24a).

Notice another characteristic of relative clauses exemplified in (24a).
This sentence contains the pronoun <u>humaa</u> which functions as a resumptive
pronoun. Its occurrence in (24a) is optional; the relativized site could be
a gap as in (25):

(25) hadarat albintaani allataani daraba-∅ alwaladu.

     came   the girl(two) who   hit   the boy
    (The girls who the boy hit came.)

The realization of the resumptive pronoun is obligatory under the condition
that deletion of the resumptive pronoun will change the reading of the sen-
tence as in 26 (a) and (b).

(26) a. gabal-tu al-walada alladi daraba-hu Ali.

       met-I   the boy   who   hit   him Ali
       (I met the boy who(m) Ali hit.)

    b. gabal-tu al-walada alladi daraba Ali.

       met-I   the boy   who   hit   Ali
       (I met the boy who Ali hit.)

26 (a) and (b) are semantically two distinct sentences. In (26a) the noun
Ali is the actor, whereas in (26b), Ali is the patient. Deletion of the
resumptive pronoun in such a case affects the relationship between the verb
and the arguments.

It is important to indicate here that in subject relativization in non-
equational sentences in Arabic, the relativized site (where the relativized
site is the subject of the embedded clause) is a gap which cannot be filled
with a resumptive pronoun as in other cases of relativization in other lan-
guages.

3.3.2 <u>Object Relativization</u>. Arabic allows relativization in any ob-
ject position: direct (D.O.) or indirect (I.O.). As in the case of subject
relativization, object relativization involves some morphological and syn-
tactic changes. Consider the sentences in (27) that involve D.O. relativi-
zation:

(27) a. ra?ay-tu al-walad-a.

       saw-I   the-boy-acc
       (I saw the boy.)

    b. darabu al-walad-u al-bint-a.

       hit   the-boy-nom the-girl-acc
       (The boy hit the girl.)

That is, given sentence (27a) where <u>al-walada</u> 'the boy' is the object as
indicated by the accusative case marker and in (27b) where it is the subject
and inflected for the nominative, relativization in the object position will
produce (27c):

   c. ra?ay-tu   al-walad-a   alladi   daraba   al-binta.

       saw-I   the-boy   who   hit   the-girl
       (I saw the boy who hit the girl.)

What we notice here is that the NP alwalad-u 'the boy' in (27b) is relati-
vized and a relative pronoun alladi surfaced following the modified NP in
the matrix clause. The same process holds for sentences 28 (a) through (c)
below. Note that the NP alwalad-aani 'the two boys' in (28b) differs syn-
tactically and morphologically from the NP alwalad-ayni in (28a). The
former is the subject and it is inflected for the nominative, whereas, the
latter is the object and it is inflected for the accusative.

   (28) a. ra?aytu   al-walad-ayni.

            saw-I   the boys-two-acc
            (I saw the two boys.)

        b. daraba   al-walad-aani   al-bint-a.

            hit   the-boys-two-nom the-girl-acc

        c. ra?ay-tu   al-waladayni   alladayni   darab-aa   al-binta

            saw-I   the-boy-two   who   hit-Ag   the girl

In looking at 28 (a-c) we expect the relative pronominal in (c) to be
alladaani 'who-nom'. but instead we have alladayni.

     The question which comes to mind here again is, how can these facts
be analyzed? To answer this question, it could be suggested that RCF in-
volves two steps: (1) relativization of the NP in the embedded clause,
almuhaadirataani 'the two lecturers' in the case of (29b), which is real-
ized as a relative pronominal allat as in (29c), and (2) a movement of the
relative pronominal allat from the embedded clause to the matrix clause.
It follows also that the case assignment rule takes place after the move-
ment rule has applied, where the relative pronoun agrees in case with the
preceding NP in the main clause, as shown in (29d), and as a result we get
(29a):

   (29) a. qaabal-tu   al-muhaadirat-ayni   allat-ayni

            met-I   the lecturers(f)-two who-two

            zaara-taa   al-jami9ah.
            visited-Ag the-university
            (I met the two lecturers who visited the university.)

        b. [qaabaltu   al muhaadir   [al-muhaadir   zaara-taa   al-jami9ah.]
                        [+dual]   [+dual]
                        [+fem]   [+fem]
                        [+acc]   [+nom]

c.
$$
\begin{bmatrix}
\text{qaabaltu} & \text{al muḣaadir} & \begin{bmatrix} \text{allat} & \text{zaarataa} & \text{al jami9ah.} \\ \begin{bmatrix} +\text{dual} \\ +\text{acc} \end{bmatrix} \end{bmatrix} \\
& \begin{bmatrix} +\text{dual} \\ +\text{fem} \\ +\text{acc} \end{bmatrix}
\end{bmatrix}
$$

d.
$$
\begin{bmatrix}
\text{qaabaltu} & \text{al muḣaadir} & \text{allat} & \text{zaarataa} & \text{al jami9ah.} \\
& \begin{bmatrix} +\text{dual} \\ +\text{fem} \\ +\text{acc} \end{bmatrix} & \begin{bmatrix} +\text{dual} \\ +\text{acc} \end{bmatrix}
\end{bmatrix}
$$

If we were to apply case assignment as a cyclic rule, one would expect the
relativized NP to move with its nominative case marker <u>allataani</u> 'who'
rather than <u>allatayni</u> as in (30), and the resulting sentence would be un-
grammatical.

(30) *qaabal-tu al-bintayni allataani zaara-taa al-jami9ah.

    met-I   the girl-two who   visited-Ag the university
    (I met the two girls who visited the university.)

In this case, the resumptive pronoun is a gap that cannot be filled, since
the relativized site in the embedded clause is in the subject position, as
discussed previously (cf. section 3.3).

    Relativization into indirect object (I.O.) position operates basically
in the same manner, as can be seen in the examples in (31) through (33):

(31) a. al-waladu alladi ?a9taa ar-rajulu al-kitaaba la-hu dahaba.

        the boy   who   gave   the-man   the book   to-him left

        (The boy to whom the man gave the book left.)

    b. al-waladu alladi ?a9taa-hu ar-rajulu al-kitaaba dahaba.

        the-boy   who   gave-him   the-man   the-book   left

    c. al-waladu alladi ?aitaa- ar-rajulu al-kitaaba dahaba.

        the boy   who   gave-   the man   the book   left

(32) ?at-taalibaani alladaani ?ahadaa al-mu9allimu al-jaa?izata

    the-students(two) who   awarded the-teacher   the-prize

    la-humaa taxarraj-aa.

    to them   graduated-Ag
    (The two students to whom the teacher awarded the two prizes
    graduated.)

(33) ?al-muhandis-uuna alladiina manaḣat-hum al-ḣukuumatu

    the-engineers-pl   who   granted-them the-government

    al-jaa?izata taraka.
    the prize   left
    (The engineers to whom the government granted the prize left.)

The examples in 31 (b) and (c) indicate that there is interaction between the dative movement rule and relativization. However, Arabic does not require I.O. to be promoted to D.O. position to make it more topical and more accessible for relativization. The semantic complexity is resolved by case marking and the presence of a resumptive pronoun. This holds also for relativization into oblique positions as well. Note that the presence of a resumptive pronoun is optional in sentence (31) as shown in (31c), where the replacive pronoun -hu 'he' does not surface, whereas in both (32) and (33) the resumptive pronoun materializes. To illustrate the process of I.O. relativization, consider the following:

(34) a. manahat   ad-dawlatu al-ja?izata li-l-mu9allim-iina.

      granted   the-government the-prize to-the-teachers-pl-gen

    b. ?al-mu9allim-uuna tagaa9ad-uu.

      the-teacher-pl-nom retired-Ag
      (The teachers retired.)

    c. ?al-mu9allim-uuna alladiina manahat ad-dawlatu

      the teacher-pl-nom who   granted the government

      al-ja?izata la-hum tagaa9d-uu.

      the-prize   to-them retired-Ag
      (The teachers to who(m) the government granted the prize
      retired.)

Here again, sentence (34c) is an embedding of (34a) into (b). Notice that the head NP al-mu9allimuuna 'the teachers' in (34b) is a nominative subject, wheras the same NP in (34a) is an indirect object inflected for the genitive -iina because of the preceding preposition. After RCF applies, the NP almu9allimiina in the embedded clause relativizes into the head position of the relative clause, leaving the resumptive pronoun -hum 'they' behind as exemplified in (34a). One of the peculiarities to be noted here is that the relative pronoun allad-iina seems not to agree with the head NP al-mu9allim-uuna, rather it kept the syntactic features of the relativized NP in the embedded clause. To solve this problem, schools of Arabic linguistics have adopted two different positions with regard to the form of the plural relative pronoun: (1) the plural relative pronoun is invariable regardless of case, which is the case in (34c) above, and (2) there are two forms of the plural relative pronoun: (a) allad-uuna which is inflected for the nominative, and (b) allad-iina which is inflected for the accusative. If we were to adopt the latter position, sentence (34c) would be ungrammatical, since case marking is suggested to be a final stage rule and the correct form would show agreement with the preceding NP in case, number, and gender.

It should be clear from the examples given thus far, that D.O. and I.O. relativization are similar processes. It is only in the case of I.O. relativization, where no dative movement has applied, that the retention of a resumptive pronoun is obligatory, otherwise, it is optional in both D.O. and I.O..

To summarize sections (3.3.1) and (3.3.2), it has been demonstrated, contrary to the topic-comment analysis and deletion analysis (Anshen & Schreiber 1968; Lewkowicz 1971; Killean 1972; etc.), that RCF in Arabic involves a movement rule that consists of:

    A. Relative pronominalization of the NP in
       the embedded clause

    B. Relative pronominal fronting into the
       head position of the relative clause

It follows that case assignment rule applies finally as a post cyclic rule. I will now discuss relativization into oblique positions.

    3.3.3 <u>Relativization into Oblique Position</u>. Keenan and Comrie (1977) have proposed that the grammatical function of the NP determines its accessibility to relativization. As a result, the position of the NP on the AH determines the degree of complexity of the relative clause formed on that position. Assuming that this proposal is correct, it is predicted that resumptive pronouns will be used obligatorily when one relativizes in low positions on the AH. It will be shown that this prediction is supported by the data on Arabic in the discussion hereafter.

    Arabic is one of the languages that permits relativization into oblique positions (oblq hereafter). Consider the following examples:

(35) ?al-maktabatu allati ?ista9ar-tu al-kitaaba min-haa ba9iidah.

the-library   which   borrowed-I   the-book from-it   far
(The library from which I borrowed the book is far.)

(36) ?al-midyatu allati ta9ana al-waladu ər-rajula bi-haa jadiidah.

the-knife   which stabbed the-boy   the-man   with-it   new
(The knife with which the boy stabbed the man is new.)

(37) zur-tu al-ma9rada alladi ?iš̌taraa ar-rajulu

visited-I the-showroom which bought   the-man

as-sayyarata min-hu.

the-car   from-it
(I visited the showroom from which the man bought the car.)

The relativized <u>NPs</u> in (35), (36) and (37) are <u>?al-maktabah</u> 'the library' <u>?al-midyah</u> 'the knife', and <u>al-ma9rada</u> 'the showroom', respectively. All of these <u>NPs</u> have been relativized in lower position on the hierarchy as indicated by the resumptive pronouns -<u>haa</u> in both (35) and (36) and -<u>hu</u> in (37), respectively, which they left behind. Note also that in these sentences the relativized <u>NPs</u> are inflected for the genitive as a result of being objects of prepositions. However, these <u>NPs</u> after relativization has applied are assigned new cases, nominative in (35) and (36), respectively, because the modified <u>NPs</u> <u>al-maktabat-u</u> and <u>?al-midyat-u</u> are nomina-

tive subjects and hence relative pronouns agree with the preceding NP in
case, number and gender as it has been argued in this paper thus far, where
case assignment is a post cyclic rule. In (37) the relative pronoun <u>alladi</u>
is inflected for the accusative as predicted by the case assignment rule
since the modified NP <u>al-ma9rad-a</u> 'the showroom' is in the object position
in the matrix clause. However, the case marker on the relative pronoun
<u>alladi</u> is not transparent.

Having presented the data on oblq relativization, the question that
arises here is, how can the facts discussed be accounted for? And more
specifically, what is the process involved in relativization into oblq po-
sition? To explain these facts, the following examples are illustrative:

(38) a. ?al-ma9rad-aani   allad-aani   ?ištaraa   ar-rajulu

       the-showroom-two which-two   bought   the-man

       as-sayyaraata   min-humaa   ba9iidaani.

       the-cars   from-them   far
       (The two showrooms from which the man bought the
       cars are far.)

   b. [?al-ma9rad-aani   [?ištaraa   ar-rajul   as-sayyaaraata

      the-showroom-two   bought   the-man   the-cars

      min-al-ma9rad-ayni   ba9iidaani.

      from-the-showroom-two   far

   c. [?al-ma9rad   [?ištaraa   ar-rajulu   as-sayyaarata
      [+dual]   VP   subj-nom   obj-acc
      [+nom]

      min-allad   ba9iid.
      [+dual]   [+dual]
      [+gen]   [+nom]
      [+wh]

   d. [al-ma9rad   allad   ?ištaraa   ar-rajulu   as-sayyaarata
      [+dual]   [+dual]
      [+nom]   [+nom]

      min-humaa   ba9iid
      +RP   [+dual]
              [+nom]

(39) *al-ma9radaani   alladayni   ?ištaraa   arrajulu   assayyaraata

      the-showroom-two which   bought   the man   the cars

      minhumaa   ba9iidaani.

      from-them   far

Relativization of dual and plural nouns in Arabic clearly indicates the morphological and syntactic changes on the relativized NPs according to the positions they occupy in sentences. Note in (38b) the NP alma9rad-ayni 'the two showrooms' in the embedded clause is inflected for the genitive as indicated by the suffix -ayni, whereas the relative pronoun allad-aani 'which' in (38a) is inflected for the nominative as can be noted by the suffix -aani. Examples (38a-d) explain how such a change came about. As can be seen, the NP al-ma9rad-ayni of the embedded clause in (38b) is relativized into the relative pronoun allad as in (38c). This relative pronoun is then fronted to the head position of the relative clause as in (38d), leaving a replacive pronoun -humaa behind. Notice also that the fronted relative pronoun allad is assigned a new case marker according to the new position it occupies, which indicates that case assignment is a final stage rule. Violation of this rule results in ungrammatical sentences as exemplified in (39).

To summarize this section, three things have been demonstrated: First, relativization into oblq positions involves a movement rule which relativizes an NP in the embedded clause into a relative pronominal, then this relative pronominal is fronted into the head position of the relative clause. Second, case assignment applies as a final stage rule and finally, relativization into oblq positions in Arabic results in the realization of an obligatory resumptive pronoun which brings support to Keenan and Comrie's proposal indicated at the beginning of this section.

3.3.4 <u>Relativization and Grammatical Agreement</u>. As may have been noticed from the discussion thus far, the analysis presented here depends heavily on grammatical agreement. We have described the case agreement aspect and its role in the derivation of even simple sentences, but we said little about verb agreement. In this section, we focus briefly on both of these aspects to demonstrate the validity of our analysis. In this respect, consider the following:

(40) a. dahaba   al-walad-u   b. al-waladu   dahaba
         went   the boy   the boy   went

     c. dahabat   al-bintu   d. al-bint-u   dahabat
         went   the-girl   the-girl   went

(41) a. dahaba   ?al-?awlaadu   b. ?al-?awlaadu dahab-uu
         went   the-boys   the-boys   went-Ag

     c. dahabat   al-banaatu   d. albanaatu- dahab-na
         went   the-girls   the girls   went-Ag

In sentences 40 (a) and (c) the ordering is verb-subject, whereas in 40 (b) and (d) the ordering is subject-verb. However, the agreement on the verb dahaba(t) is the same in either order because both nouns alwaladu 'the boy' and al-binta 'the girl' are in the singular. In contrast, sentences 41 (b) and (d) show different endings than (a) and (c). In the former, the order-

ing is subject-verb and in this case the verb must agree with the noun in number and gender as shown in dahab-uu and dahab-na, respectively, whereas in the latter, agreement is shown only in gender as indicated by the suffix -t on dahabat in (c). Let us now see how agreement works in relativization and what that indicates. Consider the following examples:

(42) a. dahaba   al-walad-aan   ?ila   New York.

      went   the-boy-two   to   New York.
      (The two boys went to New York.)

   b. al-walad-aani   raja9-aa-.

      the-boy-two   came-Ag
      (The two boys came.)

   c. al-waladaani   alladaani   dahab-aa   ?ila   New York   raja9-aa.

      the-boys-two   who   went-Ag   to   New York   came-Ag

Notice that the verb dahaba in (42a) does not show agreement in number with the following subject al-waladaani 'the two boys'. In (42c) after relativization applies where (a) is embedded in (b), the verb dahab-aa shows agreement with the relative pronoun alladaani as indicated by the suffix -aa. These facts demonstrate that the relativized subject of the embedded clause is a dual noun and that the relative pronoun does not agree with the preceding head NP but does with the verb in the embedded clause.

Another aspect that needs to be underscored here is noun morphology which is the same as relative pronouns. The inflection for the dual is -aani for the nominative and -ayni for the accusative and genitive. The inflection for the plurals differs according to the type of plural. In the case of 'broken plurals' (which do not follow a defined rule in the way they are formed), the inflection is the same as that of the singular: -u, -a, and -i for the nominative, accusative, and genitive, respectively. In the case of 'sound plurals' (which are formed on the basis of defined rules), we have to distinguish between masculine sound plurals and feminine sound plurals. Masculine sound plurals have the inflection -uuna for the nominative, and -iina for the accusative and the genitive; whereas, feminine sound plurals have -u for the nominative and -i for both accusative and genitive.

Interestingly enough, relative pronouns have the same agreement patterns as nouns have. Consider this example:

(43)   ra?ay-tu   al-mu9allim-iina   allad-iina   manahat-hum

      saw-I   the-teacher-pl   wh-Ag   granted-them

      addawlatu   al-ja?izah.
      the government the-prize
      (I saw the teachers whom the government granted the prize.)

Note that in (43) the relative pronoun <u>alladiina</u> carries the same agreement
that the noun <u>almu9allim-iina</u> has. In the case of masculine and feminine
singular, the agreement on the relative pronoun, <u>alladi</u> and <u>allati</u>, respec-
tively, is not transparent. In the case of the dual, the distinction is
clear and it has the same inflection nouns have, i.e. <u>-aani</u> for nominative
and <u>-iina</u> for the accusative and genitive. The same is true of plural re-
lative pronouns (cf. 3.3.2).

The point here is that if one were to assume that relative pronouns
are either variants or the definite article <u>-al</u> (cf. Lewkowicz 1971; Kil-
lean 1972), or inserted pronouns via a copying-deletion rule (9) and (10),
it would be impossible to account for all these different agreement mani-
festations: number, case, and gender.

4.0 CONCLUSIONS AND THEORETICAL IMPLICATIONS

This paper has presented an argument for RCF in Arabic. First, it
has demonstrated that RCF in Arabic is a movement rule and involves the
following: (a) relative pronominalization of the NP in the embedded
clause, and (b) relative pronominal fronting into the head position of
the relative clause. Second, case assignment in Arabic is a post cyclic
rule. Third, the relative pronoun <u>alladi</u> is a relativized NP in the em-
bedded clause being fronted into a higher position via a movement rule.
Fourth, grammatical agreement in Arabic is a crucial phenomenon in all
attempts to account for language facts. Negligence of this phenomenon
results in an improper analysis of the language as shown to be the case
of copying-deletion analysis. Fifth and finally, VSO represents the un-
marked word order in Arabic.

Further investigation on relativization in Arabic could concentrate
on other crucial aspects of relativization such as indirect mode relati-
vization (i.e. the relativized NP in the embedded clause is syntactically
different from the corresponding NP in the matrix clause, but yet they
are semantically understood to be the same). For example:

(44) -?antumaa alladaani dahab-aa ?ila -al-mubaarati!

you-dual   who   went-Ag   to   the-match
(You are the ones who went to the match!)

Note that the subject of the embedded clause being relativized is <u>humaa</u>
'you' whereas the head NP subject is <u>?antumaa</u> 'you'. The former is a
third person pronoun whereas the latter is a second person pronoun. It
would be interesting to see how the so-called copying-deletion analysis
would account for this type of relativization.

NOTES

^{1}'?' represents the glottal stop.

^{2}'9' represents the voiced pharyngeal.

^{3}'ḥ' represents the voiceless pharyngeal.

^{4}Arabic has one form of the definite article -al. However, there is a phonological assimilation rule which assimilates it with the following consonants if they are $\begin{bmatrix} +\text{anterior} \\ +\text{coronal} \end{bmatrix}$. Some of these consonants are: ḍ, ṣ, s̱,

ṯ, ṟ, ẕ, and so on.

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DERIVATIONAL CONDITIONS ON MORPHEME STRUCTURE IN EWE

Herbert Stahlke

Phonological constraints on the lexicon of a lan-
guage may describe a form which never occurs phonetically. How-
ever, not all constraints on morpheme structure are lexical.
Rule interaction in Ewe, affecting both vowels and tones,
results in the neutralization of the phonological sequences
-ee# and + ⌈-sonorant⌉ [+H] [+H] #, the former with -ii#,
          ⌊+voiced ⌋
and the latter with a [-H] [+H] sequence. Only nouns have a
structure which participates in these neutralizations. As a
result the Kpando dialect has no lexical entries for nouns
ending in the two sequences that are neutralized. The
elimination of these sequences by morpheme structure conditions
rather than by rule interaction is costly and is contra-
indicated by dialectal evidence.

Introduction

Phonological theory allows a variety of hypotheses con-
cerning the nature of underlying phonological representations.
One of these positions, the now-classic theory presented in
Chomsky and Halle's The Sound Pattern of English, allows an
underlying representation which exhibits properties of
various superficial representations while remaining distinct
from all surface forms. Such abstract underlying forms are
argued for in Kenstowicz and Kisseberth (1977) on a number
of grounds. One example of such abstract forms is cited from
the American Indiana language Tonkawa, which has the surface
root forms show in (1).

(1)	A	B	C	D	gloss
	notx	ntox	notxo	ntoxo	'hoe'
	netl	ntal	netle	ntale	'lick'
	picn	pcen	picna	pcena	'cut'

(Kenstowicz and Kisseberth 1977:16)

The underlying representations of the three root sets are (2).

```
(2)    notoxo        'hoe'

       netale        'lick'

       picena        'cut'
```

None of these underlying forms ever occurs as a surface form, but the surface forms cannot be derived without the information contained in (2). In each case a vowel deletion analysis is simpler than a vowel insertion analysis since vowel insertion would require specifying the vowel for each syllable of each word, a condition not unlike writing rules to insert the vowels of English monosyllabic verbs.

Compatible with the abstractness hypothesis is the claim that the abstract underlying forms of a language are subject to certain universal and language-specific conditions. These conditions on morpheme structure (Stanley 1967) define the canonical shapes of the morphemes of a language and are generally considered to have the role of reducing redundancy, or the cost of redundancy, in the lexicon. The canonical shapes may also be forms which are never found phonetically. Thus, for example, strong reason exists for supposing the morpheme structure of Ewe to permit a final nasal. I have argued elsewhere (Stahlke 1971a) that various vowel and nasality alternations in Ewe cannot be explained without an underlying morpheme-final nasal which never occurs as a phonetic nasal consonant.

It has occasionally been observed that the generalizations captured by morpheme structure conditions are found also in the phonological rules. In vowel harmony systems, for example, restrictions found within morpheme boundries frequently extend to the vowels of derivational and inflectional affixes as well. Fresço (1970) demonstrates that in some Yoruba dialects, such as Ìfàkì, the person and tense/aspect prefixes on a verb harmonize with the vowel of the verb, as in (3).[1]

```
(3)    mɔ tI lɔ        'I have gone.'

       mo ti rí        'I have seen.'
```

In other Yoruba dialects, including Standard Yoruba, vowel
harmony is only a morpheme structure condition and does
not spread to verbal prefixes. Thus 'I have gone' would
be as in (4).

(4)   mo ti lɔ   'I have gone.'

For the Ifaki dialect it could be argued that the morpheme
structure condition functions as a so-called 'anywhere' rule,
applying in an unordered fashion whenever its conditions
are met.

Kenstowicz and Kisseberth (1977) discuss such inter-
actions between morpheme structure conditions and phono-
logical rules as cases of functional unity or conspiracy.
The grammar may contain otherwise unrelated sets of rules
whose combined effect is to bring forms into conformity
with a surface constraint. A case of this in Kpando Ewe
is the Equal Height Condition on vowel sequences which
requires that all word-final phonetic vowel sequences con-
tain vowels of the same tongue height. This surface phonetic
condition is the result of a number of independently moti-
vated, unrelated rules that adjust the height of one vowel
to another (Stahlke 1971b).

The types of rule interaction discussed so far are,
in a sense, all forward-looking. That is, morpheme
structure conditions are allowed to apply after certain
phonological rules, or, alternatively are replicated by
rules later in the phonology. Also, certain rules combine
their effects to produce phonetic sequences that conform
to certain output conditions on the grammar. It is argued
in this paper that phonological rules may also interact
to block certain otherwise normal forms from occurring
phonetically and in the process may eliminate a phonologically
definable class of canonical morpheme from the lexicon
This absence from the lexicon of certain phonological
sequences is caused by and accounted for by normal rule inter-
actions and can be accounted for by morpheme structure
conditions only at the cost of otherwise unmotivated
statements. Two examples of such rule-determined systematic
lexical gaps will be discussed, one involving the absence of
nouns ending in a long e, and the other the absence of noun
roots of the shape (5).

(5)   +   C   V   V   +
                [-sonorant] [+H]   [+H]
                [+voiced]

The Absence of Cee

In most works on Ewe, the third singular clitic pronoun is given as short e.[2] In the Kpando dialect the subject pronoun will always become short ɛ, and the object pronoun will do so after short a and short ɔ.

In all Ewe dialects, the following forms are found.

(6)   Underlying form   Assimilated form

    (i) fi + e   'steal it'   fii

    (ii) wu + e   'kill it'   wui

    (iii) dze + e 'spoil it'   dzee or dzii

    (iv) ƥo + e   'beat it'   ƥoe or ƥui

The general tendency, then, is for the pronoun to assimilate to a high vowel in a verb stem. Thus in (6) we find sequences of high vowels and sequences of non-high non-covered vowels, but there are no vowel sequences in which we find both high and non-high vowels. The basic rule in (6), then, seems to be something like (7).

(7)   V   --->   [+high]   /   V   ____
        ⎡-high   ⎤   [+high]
        ⎣-covered⎦

That is, short e becomes short i after a high vowel. The second vowel change attested in (6) is the raising of non-high, non-covered vowel sequences to high vowels, giving dzi + i and ƥu + i from dze + e and ƥo + e respectively. We will formulate stem vowel raising as in (8).

(8)   V   --->   [+high]   /   ____   [-covered]   ##
        ⎡-high   ⎤
        ⎣-covered⎦

Rule (7) must apply only in word-final position. Otherwise all non-final sequences of non-covered vowels will become high. This is wrong since such sequences as ie in asieke 'nine' and mieyi 'we went' never become long ii. The final form of (7), then, is (9).

(9)   Final vowel assimilation

           V   --->   [+high]   /   V   ____   ##
        ⎡-back   ⎤   [+high]
        ⎣-covered⎦

There is also a rule of e-lowering which all dialects
seem to have, by which short e become short ε when following
the low vowel a. This is coupled with a rule raising short
a to short ε, so that no Ewe dialect for which we have in-
formation has the word-final vowel sequences ae or aε in
surface forms. ae will be present in underlying forms as
one of the sources for long εε in all dialects. e-lowering
operates across word boundaries; a-raising applies just
within a word. Therefore the two rules must be stated
separately as (10) and (11).

(10)   e   --->   [+covered]   /   [+low]   (##)

(11)   a   --->   [-low]   /   _____   ε

These two rules, then, account for the assimilations in (12),
producing forms which are found in all Ewe dialects.

(12)   Underlying form   Assimilated form

          ɖa + e   'cook it'   ɖεε

          ná + e   'give him'   nɛ́ε

          lá + e   'cut it'   lɛ́ε

     The treatment of the third singular object pronoun in
Kpando differs from other dialects only in that coveredness
assimilation lowers short e to short ε after short ɔ as well
as after short a. Thus where other dialects have (13i), in
which the underlying form is unchanged in the surface, Kpando
has (13ii).

(13) (i)   wɔ́e   'do it'

           tɔ́e   'stab it'

           dɔ́e   'send it'

           fɔ́e   'find it'

     (ii) wɔ́ε   'do it'

           tɔ́ε   'stab it'

           dɔ́ε   'send it'

           fɔ́ε   'find it'

The surface vowel sequences which will be found in
Kpando verb + third singular object pronoun constructions
are given in (14) with their underlying sources and de-
rivational paths.

(14)   ii⟵   ie   by (9)

                     ee   by (8) and (9)

        ee   ee

        εε   ae   by coveredness assimilation and
                                (11)

        ɔε   ɔe   by coveredness assimilation

        oe   oe

        ui⟵⟶oe   by (8) and (9)

                    ue   by (9)

If a noun ends in a final vowel sequence, the sequences
which are found at the systematic phonetic level in Kpando
are as follows:

(15)   ii   fíí   'digging stick'

              detíí   'cotton'

              nέέ   'nut'

              kέέ   'root'

        aa   taá   'head'

              táã   'pool, body of water'

        ɔɔ   atɔ́ɔ́   'nest'

              avɔɔ́   'cloth'

        oo   goó   'gourd'

              toó   'mortar'

        uu   nuú   'mouth'

              kuú   'seed'

              kɔ̃έ   'soap'

              ahlɔ̃έ   'antelope'

oe	asipodoé	'palm of hand'
	awunugboé	'button'
ui	tui	'broom'
	kuí	'native money'

As (15) shows, Kpando has no nouns ending in long ee. The absence of this vowel sequence can be accounted for synchronically in either of two ways: either rule (8) raising short e to short i before any [-covered] vowel is obligatory in nouns, even though it is optional in verb and object pronoun sequences; or long ee become long ɛɛ by a number of rules for e-lowering discussed in Stahlke (1971b). If the former analysis is adopted, we have a complete synchronic merger of the underlying sequences long ii, ie and long ee in nouns. Rule (8) will raise the first segment of long ee to i, and then (9) will raise any final e which immediately follows i. Thus there would be no means of distinguishing the long ii sequences which are underlying from those which arise through (8) and (9). If such an absolute meutralization as we have proposed actually occurs in Kpando, there is no longer any basis for claiming that Kpando has underlying long ee or ie sequences in nouns since these sequences will always become long ii. The proposal that long ee becomes long ɛɛ seems obviously wrong since e does not lower in a vowel sequence unless the other vowel of the sequence is [+covered] that is ɛ, ɔ, or a. Long ee, then, is blocked from lowering unless we posit a special rule, applicable only to nouns, to lower long ee to long ɛɛ. Such a rule would be arbitrary since there is no evidence for it beyond the problem it is intended to solve. Further evidence that long ɛɛ is not derived from long ee is the fact that the two do not alternate. Short e does not lower if the adjacent syllable contains a high vowel, and so we would expect that, if nɛɛ́ and kɛɛ́ are underlying néé and keé, they will remain so if followed by ví, the diminutive clitic, producing *néé+ví 'small nut' and *keé+ví 'small root', instead of the correct forms nɛɛ́+ví and kɛɛ́+ví. Thus not only does this second analysis require an arbitrary rule, but this rule will apply in an environment where the corresponding rule for short vowels cannot apply.

The problems involved in the second analysis would suggest that underlying long ee has merged with long ii and that synchronically Kpando no longer has long ee as an underlying vowel sequence, were it not for the fact that in nouns Kpando long ɛɛ usually corresponds to long ee in other dialects (16).

(16) | Kpando | Peki | Togo | |
|--------|------|------|---|
| trɛ́ɛ̀ | tréé | tréé | 'calabash' |
| kɛɛ̀ | keé | keé | 'root' |
| adzɛɛ̀ | adzeé | adzeé | 'witch' |
| kɛ́ɛ̀ | kéé | kéé | 'sand' |

Diachronically, then, Ewe long ee has become Kpando long
ɛɛ, but this is no longer a synchronic process since no
alternation between long ee and long ɛɛ are found. Since
neither of our synchronic solutions stands up under
examination, we are forced to the position that there is no
underlying long ee in Kpando nouns, where the two vowels
are not separated by a morpheme boundary. The next
question is where long ɛɛ comes from. It cannot result
from e-lowering since there are no alternations and since
long ee does not lower elsewhere in the synchronic phonology,
and yet it would be most unusual for a long ɛɛ to be an
underlying segment in a language in which short ɛ is not,
even though all other vowels have both long and short forms.
This leaves us with one alternative. After long ee was
lowered historically, the resulting vowel sequence long ɛɛ
was reanalysed as ae, the only sequence from which long ɛɛ
is derived elsewhere in the grammar. Thus underlying all
instances of long ɛɛ in Kpando nouns is the sequence ae.
Ansre's (19) example agbɛɛ́ 'small plate', from agbaá + e,
lends support to this analysis. Underlyingly, then,
Kpando has only the following vowel sequences.

(17) (i)   uu   (ii) ie   ue

            oo   oe

            ɔɔ   ɔe

      aa   ae

Those in (17ii) are realized as in (18).

(18) ii   ui

           oe or ui

      ɛɛ   ɔɛ

Our analysis of long ɛɛ as the surface representation of
ae enables us to account for an otherwise inexplicable gap
in the set of surface vowel sequences. Short a is the only
covered or back vowel which does not appear before a non-
low front vowel in the surface phonology, although we
would expect the surface sequence aɛ. However, rule (11),
which raises a to ɛ before ɛ, eliminates all surface
instances of aɛ.

Since, as we mentioned above, the diminutive -é is
non-productive in Kpando, we have not been able to test
whether an underlying long ee would remain long ee or be-
come long ii. Other dialects apparently have all seven
underlying vowels, and in some dialects, fewer assimi-
lations take place, so the surface vowels will be the
same as the underlying vowels. Peki, on the other hand,
seems to share all assimilations which Kpando has, but
it does not have unconditioned e-lowering, and so long ee
and long ɛɛ are both found. Peki does have the same
e-lowering rule of coveredness assimilation as Kpando has,
but it is restricted to nouns, since Ansre (19) lists
the sequence ɔe as occurring verb + object pronoun con-
structions. Peki, then, has e-lowering only after the low
vowel, and not elsewhere.

The diachronic lowering of Kpando long ee to long ɛɛ
and subsequent reanalysis of long ɛɛ as ae in conformity
with independently motivated rules of Kpando phonology
raises an interesting problem of lexical representation.
As we mentioned above, the vowel-raising rules make it
impossible to distinguish between underlying long ee in
a single morpheme and underlying long ii, since the former
will in all cases be raised to long ii with no tell-tale
alternations. The fact that there is a vowel-raising
rule implies that there will also be a vowel to be raised,
as is the case in verb + object pronoun sequences, but
this same rule absolutely neutralizes long ii and long ee
in nouns. To say that Kpando has no long ee in its lexicon,
therefore, would contradict the implication of vowel-
raising. The absence of long ee from single morphemes in
the lexicon could be captured by a morpheme structure
condition, but such a condition would have to duplicate
the information which must also be stated in rules (8)
and (9). Since (8) and (9) are needed, it seems that the
absence of long ee from the lexicon is to be accounted for
by phonological rules rather than by conditions on morpheme
structure. The morpheme structure condition would simply
be redundant.

Long High Tone after Noun Stem Voice Obstruent

In noun roots with long vowels, Ewe allows the surface
tone patterns shown in (19).

(19) (i) H H

       ayíí   'skin'

       nɛ́ɛ́   'palm nut'

       fyáá   'axe'

       kɛ́ɛ́   'sand'

(ii)   M H

         àkpaá   'fish'

         fií   'digging stick'

         amaá   'greens'

         lɛ̃ɛ̃́   'bridge'

(iii)   L H

         àgbàá   'plate'

         àvɔ̀ɔ́   'cloth'

         bàá   'mud'

         dzòó   'horn'

A number of facts strike one immediately from (19).
First, all stem-final long vowels end on a high tone.
Second, HH and MH contain no nouns with a voiced ob-
struent as a stem consonant, and LH contains nouns only
of that shape. This distribution is consistent with Ewe.

     Although there exists as yet no satisfactory expla-
nation for the absence M and L in final position, there is
obviously no such restriction on the first stem vowel.
Only if that vowel is preceded by a voiced obstruent do
we find a restriction on tone, since Ewe nouns do not
generally allow a high tone after a voiced obstruent
stem consonant. In compounds, however, where the noun
prefix has been deleted, a high tone will be found after
some stem-initial voiced obstruents, as in (20).

     (20) (i) núdazɛ́   'pot for cooking food'

               cf. ɛ́da nú zɛ̀ɛ́mɛ   'He cooked food in a pot'

               kɔsíɗá   'Sunday'

               (kɔsí (day name) + ɗàá 'date')

               alãláhɛ̃   'knife for cutting meat'

                cf. ɛ́tsɛ́ 'hɛ̃̀ɛ̃́ lá alã 'He cut meat with a
                                          knife.'

(ii)   gàgóǒ   'oil drum'

        (gà 'metal' + gòǒ 'gourd')

        tsinodzoǒ 'horn for drinking water'

        cf. ɛ́tsɛ́ dzòǒ no tsi 'He drank water with
                                a horn.'

The alternation between high tone and low-high rising tone
requires a rule of tone-insertion which, together with
other rules, will operate on underlying stems of the form
(21i) to produce the surface forms show in (21ii). The
prefix of any obstruent-initial noun will be realized on
a low tone. This lowering does not occur before a stem-
initial sonorant.

(21)   (i) ⌈   ⌈-H⌉   +   ⌈-sonorant⌉   [+H]
            | ⌊-L⌋   ⌊+voiced ⌋
            ⌊Noun

        (ii) <u>Underlying form</u>   <u>Derived form</u>

            aɖá   'sugar cane'   aɖaá

            adzé   'witch'   adzeé

            abá   'mat'   abaá

            abɔ́   'arm'   abɔɔ́

            avé   'forest'   aveé

            avú   'dog'   avuú

            Ødé   'oil palm'   Ødeé

            Øvé   'throat'   Øveé

            Ødɔ́   'work'   Ødɔɔ́

            Ødzí   'sky'   Ødzií

            Øzé   'pot'   Øzeé

            Øgbɔ́   'goat'   Øgbɔɔ́

A rule of low tone assimilation (LTI) will then apply to
nouns of the shape (22i), accounting for the surface forms
show in (22ii).

(22) (i)   -H   -sonorant   -H   [+H]
                            +L   +voiced
                    Noun

    (ii)   Underlying form   Surface form

            àdzɔéN   'tsetse fly'   àdzɔ̃ɛ́

            àvɔɔ́   'cloth'   avɔɔ̀́

            àdeé   'saliva'   àdeè́

            àbɔɔ́   'garden'   àbɔɔ̀́

            ∅̀deé   'native land'   ∅̀deè́

            ∅̀dzoo   'horn'   ∅̀dzè́

            ∅̀goó   'gourd'   ∅̀goò́

In order to account for these and a number of other al-
ternations, the following rule of tone insertion (23)
is needed.

$$(23) \quad \emptyset \quad \dashrightarrow \quad \begin{bmatrix} -H \\ -L \end{bmatrix} \quad / \quad \# \# \quad [+L] \begin{bmatrix} C \\ +voiced \end{bmatrix}^2_1 \quad \underline{\quad\quad} \quad [+H]$$

        The rule of tone insertion raises a very interesting
question. Note that there are no underlying or surface
nouns with an initial voiced obstruent plus a long high
tone vowel.   The absence of such stems at the systematic
phonetic level is predicted by LTI and the Two Vowel
Condition (Stahlke 1971c) which blocks a syllable from
having more than two vowels. LTI would insert a vowel
before the first high tone and then the Two Vowel Condition
would shorten the derived three vowel sequence to two by
deleting the second vowel. The absence of such nouns
in the lexicon is not so easily accounted for or described.
One would expect that in nominalizations, in which nouns
of this shape lose their prefixes and so fail to undergo
LTI, such long high tone stems with initial voice obstruents
would appear, but they do not.

(24)   a + C V́   a + C V́ V́

        a + C V̀   a + C V̀ V́   Prefix lowering

        a + C V V̀   a + C V V̀ V́   Tone insertion

        a + C V̀ V́   a + C V̀ V̀   Low tone
                                              assimilation

The lexical absence of such forms could be described by a morpheme structure condition specifying the first vowel of a long vowel noun stem as non-high just if the stem consonant is a voiced obstruent. This restriction would, however, duplicate the information carried by LTI and the Two Vowel Condition and would therefore complicate the grammar unnecessarily. This then appears to be another case, very similar to that of the long _ee_ sequences discussed earlier, where the absence of certain shapes or sequences from the lexicon is to be captured by phonological rules, rather than by morpheme structure conditions.

The phenomena described in this paper are a form of neutralization, but they are distinct from the absolute neutralizations that motivated Kiparsky to posit the Alternation Condition, namely, that no underlying segment can be posited which does not occur phonetically. The most obvious distinction is that these cases involve segment sequences, that is, phonological pieces that correspond to underlying forms rather than to underlying segments. It appears that while one can justify abstract underlying froms like those in (2), where a simpler description is achieved only by an abstract representation, the canonical forms of the morphology of a language cannot be described entirely by morpheme structure rules or constraints. Such constraints may well predict forms which are in fact systematically avoided because of rule interactions. The two sets of phenomena discussed above represent gaps in the forms defined by the Ewe morpheme structure condition in (25).

(25) MSC (Positive):

$$+ \begin{bmatrix} C \\ \langle \text{Noun} \rangle \end{bmatrix} (\langle \begin{bmatrix} +\text{Voc} \\ +\text{Cons} \end{bmatrix} \begin{bmatrix} -\text{Voc} \\ -\text{Cons} \\ -\text{Cor} \end{bmatrix} \rangle) \quad V_i \langle \begin{pmatrix} V_i \\ [+H] \end{pmatrix} \rangle \quad (N) \quad +$$

(25) says that a root begins with a consonant and possibly
a liquid or the palatal glide. It contains one vowel,
and, if a noun, may have a second identical vowel with a
high tone, and it may end with a nasal. It would be
possible to add the two conditions in (26) to block the
sequences under discussion.

(26) (i)   MSC (Negative): $+ C_1^2$ $\begin{bmatrix} -\text{high} \\ -\text{low} \\ -\text{back} \\ -\text{covered} \end{bmatrix}$ $\begin{bmatrix} -\text{high} \\ -\text{low} \\ -\text{back} \\ -\text{covered} \end{bmatrix}$ (N) $+$

(ii)   MSC (If-then):

IF: $+ \_ \begin{array}{c} C \\ \begin{bmatrix} -\text{son} \\ +\text{voiced} \end{bmatrix} \end{array}$ (C)   V   V   (N) $+$

THEN: [-H]

However, these conditions are complex, costly to the
grammar, and do nothing more than block sequences which
are neutralized out by independently motivated phonological
rules. That is, the absence of the sequences in question
is a function of the interaction of phonological rules.
It is not a fact about morpheme structure. All other
generalizations about morpheme structure would predict
the canonicity of such shapes, and it is only the pec-
uliar rule interactions discussed above that prevent them
from occurring. In fact, such forms do occur in other
dialects of Ewe. A change in any of these rules, which
would make Kpando more like other dialects of Ewe, would
permit lexicalization of diminutive forms ending in -é,
in which case nouns ending in -ie or -ee would occur.
Most dialects, for example, do not have stem vowel raising
(8), and this is clearly an unnatural rule that one would
expect a language to modify diachronically. If this rule
were to change in the Kpando dialect, then forms ending
in long ee would be permitted. Using MSC's to block
these sequences in the present form of the dialect would
appear to make that change more complex, since not only
would a rule change be required, but a morphological
change would also be required. Thus it is necessary to
broaden the notion of canonical shape to include not just
constraints on morpheme structure, but the results of rule
interactions as well. Such a change enables us to main-
tain the observation that phonetic changes not only occur
more easily than morphological changes but are frequently
the source of morphological change.

Epilog

Since this paper was written, the use of autoseg-
mental representation for tone and other non-segmental
phenomena has been articulated in considerable detail
(cf., e.g., Clements and Keyser 198). Both phenomena
discussed in this paper could be represented as auto-
segmental in nature. It is not clear, however, that any
advantage would arise from the autosegmental treatment
of vowel sequences. The autosegmental treatment of tone,
on the other hand, is more immediately attractive, but
not without its problems. Autosegmentally, the change
from a high tone to a rising tone in (24) coulb e re-
presented as in (27).

(27) (i)   V   C   V   V   C   V   V

            a   d   e   =>   a   d   e

            L   H   L   H

      (ii) V   C   V   V   V   C   V   V

            a   d   e   =>   a   d   e

            L   M H   L   M H
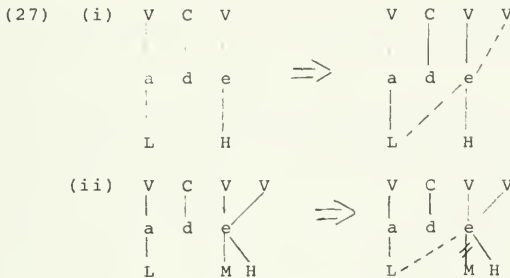
The autosegmental representation seems to eliminate the
problem of tone insertion, treating it rather as the more
natural tone spreading (Human and Schuh 19). However,
the stem vowels of the derived forms in (27) are both
long and are furthermore of the same length. Thus rule
(27i) must also insert a V element on the structural,
CV tier. It is not clear that such an autosegmental
analysis provides any greater simplicity than that pro-
posal earlier, although the structural, rather than
phonetic, treatment of vowel length seems more elegant.
The auto segmental analysis will, however, provide a simpler
and more elegant treatment of derivations like (24), where
Low Tone Insertion produces a three-vowel sequence that must
then be shortened to two under the Two Vowel Condition. Tone
spreading does not generate the extra vowel, and the Two
Vowel Condition becomes a function of canonical syllable
shape captured on the CV tier.

NOTES

[1] Both Ewe and Yoruba exhibit three surface tones, indicated by an acute accent for high tone, a grave accent for low tone, and a macronor diacritic for a mid tone.

[2] In the discussion following the presentation of this paper, Dr. Hounkpati Capo suggested that the underlying form of the third singular object pronoun be i̱, not e̱. The strength of his proposal lies in the simplification it allows in phonological rules. Specifically, rule (8), stem vowel raising could be restated as (i)

(i) $\begin{bmatrix} V \\ -high \\ -covered \end{bmatrix}$ --- [+high]/_____[+high]##

and rule (9), final vowel assimilation, could apparently be eliminated, since the final vowel would already be high. However, this proposal also has some clear disadvantages. First, it forces us to posit different underlying vowels for this singualr subject (é̱) and object (i̱) pronouns. Given that the tonal difference between subject and object is predictable, my analysis leads to a simpler lexicon, since only one entry is required for third singular, not two. Second, the reverse of rule (9) would now be necessary to account for the forms in (12) and (13ii), which exhibit the independently motivated rule (10), e̱-lowering. Rule (9) would have to be revised to lower i̱ to e̱, as input to (10), or it would have to lower i̱ to ɛ̱, duplicating the function of (10). Third, Kpando exhibits both the forms of i̱u̱ and o̱e̱ (14-15) in free variation. The current analysis avoids these problems and is preferred for Kpando.

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LOANWORD INCORPORATION PROCESSES: EXAMPLES FROM TSHILUBA*

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This paper describes some of the borrowing processes which take
place in Tshiluba, a Bantu language of Zaire, and uses the data to
explore contemporary generative phonological theories of borrowing.
The data indicate that modifications in the shape of loanwords are
not solely the result of the application of synchronic phonological
rules of the borrowing language, but may derive either from morpheme
structure constraints or as the result of universally common phonological
processes.

Words which are borrowed into a language can be incorporated into
the system of that language to differing degrees. This paper will briefly
mention some of the factors that contribute to these differences of degree
in loanwords in Tshiluba (a Bantu language of Zaire, principally spoken
in the province of Kasai), and will go on to describe some of the processes
which change the phonological shape of a loanword when it is borrowed into
this language.

1. Degrees of incorporation
In Tshiluba the differences in the degree of incorporation depend
on factors like the age of the loanword and the amount of education of
the speaker. In general speakers with little or no knowledge of foreign
languages will use fewer loanwords of the type which deviate significantly
from the canonical form of native words; likewise, older loanwords will
normally show a higher similarity to the structure of native words.[1]

An examination of the morphological structure of Tshiluba reveals
a pattern which is characteristic of Bantu languages: the system of noun
class prefixes. Tshiluba assigns all nouns to one (or more) of eight classes.
These noun classes are lexically determined, although in a few of them
traces of semantic categorization still remain. The marker of each noun
class is a pair of prefixes, one denoting singular, the other plural.
A few examples of the native Tshiluba nouns, which illustrate this system,
are shown in (1):

(1) <u>class 1</u>   mú-/bá-[2]   <u>class 3</u>   N-/N-

    [múkàžì]   woman   [nzɔ̀:lɔ́]   chicken

    [bákàžì]   women   [nzɔ̀:lɔ́]   chickens

    [múlúndà]   friend   [mpùkú]   rat

    [bálúndà]   friends   [mpùkú]   rats

class 7	čí-/bí-		class 8	ká-/tú-
[čímúmá]	fruit		[kámbíší]	cat
[bímúmá]	fruits		[túmbíší]	cats
[čísákà]	basket		[kákàžì]	little woman
[bísáká]	baskets		[túkàžì]	little women

Note that the prefixes of class 8 may also act as diminutive markers; -kàžì 'woman' can, thus, appear in class 8 as well as class 1.

In Tshiluba, one sign of a loanword which has been nativized to some extent is the presence of a noun class prefix. Another marker of (relatively strong) nativization is the avoidance of consonant clusters: native Tshiluba words have l but no r consonant clusters except for sequences of nasal + consonant. Both markers of nativization are seen in the loanwords in (2):

(2) [čìsìkítì] biscuit   [bìsìkítì] biscuits

Neither of these markers is seen in (3):

(3) [krɔ́šɛ́] crochet (noun)

As well as lacking these indications of nativization, the example in (3) also has a definite marker of foreignness: it contains an r. Native Tshiluba words have l but no r. In fact, the only real difference between the Tshiluba form of (3) and the word in French is the presence of tones. Moreover, even the tone patern (low tone on syllable not stressed in source language, high tone on stressed syllable) closely follows the intonational curve that the French word would have in isolation. It is clear that the example in (3) shows a very small degree of incorporation into Tshiluba. In fact, it is very possible that the pronunciation of this loanword in a Tshiluba sentence would be indistinguishable from the pronunication a Tshiluba speaker would give to an actual word of French inserted into a Tshiluba sentence (but, presumably inserted only if the hearers could also understand French).

Thus, we see that the degree of incorporation of a set of loanwords may range from a Fremdwort barely distinguishable from the word in the source language to a Lehnwort so similar to a native word in phonological shape that it could be taken for native if the meaning so allowed.

2. Phonological modifications
2.1.1 My primary aim in this paper is to describe some of the phonological changes that occur to borrowed words and to describe the motivations behind such changes when they do, in fact, occur. Note that it will not be a counter-example to my claims if loanwords exist which do not undergo the processes that I shall discuss; these words I will merely consider as loans

which have remained similar to the form of the source words, and, thus, not loanwords which are fully incorporated into the native phonological system of the borrowing language. As I discuss those cases in which modifications have been imposed on a loanword, I will also mention some of the generative phonological treatments of borrowing as they are applicable.

Although Tshiluba loanwords I will discuss come from several different source languages, I have found no evidence that the borrowing mechanism of the languge treats words from different source languages in significantly different ways. For example, English [ey] and [ɛ], French [e] and [ɛ], and Portuguese [e] are all consistently rendered as Tshiluba [ɛ]. Most of the example words come from French and English; these were borrowed in the late nineteenth century or in the twentieth century. Some of the loanwords are from KiKongo or Portuguese (often via KiKongo), and these seem to have been borrowed somewhat earlier, while a very few come from Swahili.

In native Tshiluba words one finds the consonant system shown in (4); sounds in parentheses are allophonic variants only:

(4)   (p)   t   k

               b   d   (d^y)

                                   č

          ɸ   f   s   š

               v   z   ž

          m   n   (n^y)   ɲ ŋ

                       l

          w   y

In general Tshiluba loanwords retain the shape of the word in the source language as much as possible. Even strongly nativized words do not radically alter their shape in many cases. Thus, in all of the examples in (5) none of the source language consonants and few of the vowels are altered in the Tshiluba words:

(5) Source lang.   Source string   Tshiluba loan   gloss

        Fr   [kaye]   [káyɛ́]   notebook

        Eng   [šiyt]   [nší:tà]   sheet

        Fr   [apɛl]   [mpɛ́:lá]   roll call

        Eng   [pɪk]   [mpíkì]   pick (axe)

Fr	[lünɛt]	[lùnɛ́tà]	glasses (sg.)
Eng	[lɛtə:]	[dʸìlɛ́:tà]	letter

There are really only two major kinds of modifications found in (5): the
addition of a final vowel, and the addition of a noun class prefix.[3] All
native Tshiluba words are vowel-final, thus, vowels have been added to
sheet, pick, glasses, and roll call. Normally, the vowel added in final
position is a or a copy of the vowel of the preceding syllable. The noun
class marker prefixed to most loanwords is a nasal. This is a marker of
noun class 3 (N-/N-), and the nasal prefix appears in the loanwords for
sheet, pick, and roll call. However, if it is possible to analyze a noun
as belonging to a particular noun class (that is, where the initial syllable
is similar to some noun class prefix), it is usually incorporated into
this class. Thus, [káyɛ́] belongs to the ká-/tú- class (this is class 8;
note [túyɛ́] 'notebooks'), and [lùnɛ́tà] belongs to the lú-/N- class (class
4).[4] The word for letter has been assigned to the second most common class
for loanwords, the dʸí-/má- class (class 6).

2.1.2 In any description of the possible phonological shapes of loanwords
one of the major difficulties is the following: what principle does a
borrowing language follow in order to replace a source language sound which
the borrowing language lacks? In other words, what happens when there
is no sound which is immediately indentifiable as the same sound, or, at
least, one which can be represented by the same phonetic symbol? The principle
which has traditionally been appealed to is the one which Hyman (1970:8)
calls the principle of "phonetic approximation". Basically, the principle
proposes that a source language sound which does not occur in the borrowing
language is replaced by the phonetically closest sound. The vagueness
of this sort of principle does not much matter in cases where the substitution
is obvious. For example, it is no surprise to any phonologist that Tshiluba
loanwords may have an l where the source language word had an r. As we
saw from the chart in (4), native Tshiluba words have no r; l is the only
liquid. Thus, there are many examples like those in (6):

(6)	Fr	[fu:r]	[mfú:lú]	(brick) oven
	Fr	[ra:y]	[lá:yì]	rail (of train)
	Eng	[rowl]	[lɔ́:là]	roll
	Fr	[byɛ:r]	[byɛlɛ]	beer
	Eng	[brʌš]	[bulɔsa]	brush

However, another gap in the native Tshiluba consonant system is the
absence of g. The principle of "phonetic approximation" does not predict
whether [k] or [ŋ] will replace a source language g, since both are equally
close phonetically. In actual fact, the sound which usually replaces g
is [ŋ], as seen in (7):

(7)	Eng	[gowld]	[ŋɔlɔ]	gold
	Fr	[gra:s]	[ŋasa]	grace

Eng	[gl æ s]	[ŋalasa]	glass
Port	[garrfʊ]	[ŋàráfù]⁵	fork
Eng	[gʌvənə·]	[ŋɔvɛna]	governor

2.1.3 As well, this principle does not even begin to account for situations in which the forms of loanwords alter even though the borrowing language has the source language sound. In an attempt to deal with this problem Hyman has suggested that "foreign sounds are perceived in terms of underlying forms" (Hyman 1970:19). In this view, the source word would be subject to modification by the synchronic phonological rules of the borrowing language.⁶ This approach does account for some additional situations. For example, in Tshiluba there is a widespread phonological process which palatalizes alveolar consonants before i.⁷ We find that some loanwords (which usually are also the ones which are strongly nativized in other respects) have been palatalized by this rule, as shown in (8):

(8) Eng   [kəbə:d]   [kábàdʸí]   cupboard

     Fr   [mašin]   [màšìnʸì]   car

     Eng   [səmɛnt]   [nšimɛta]   cement

     Fr   [šəmi:z]   [nzùmí:žì]   shirt

However, some loanwords do not undergo this rule. Often these are less fully incorporated forms. Alternatively, they may be forms used by more educated speakers, who adhere more closely to the shape of the word in the source language. Thus, we find unpalatalized forms, like those in (9):

(9) Fr   [eklezya]   [ɛ́kɛ̀lɛ́zìyà]   body of Christians

     Fr   [mašin]   [màšíni]   car

     Eng   [bɪskət]   [bìsìkítì]   biscuits

     Eng   [bɔ:d]   [mbɔ́:dì]   blackboard

2.2 In this paper I will describe in detail two cases of loanword incorporation in which the source words are modified even though the borrowing language has the source sounds in question. As well, both of these are cases where there is no synchronic rule in the borrowing language that could have effected these modifications.

2.2.1 The first set of examples are shown in (10):

(10) Fr   [mustikɛ:r]   [mùšɛ̀tɛ́kɛ́lɛ̀]   mosquito net
      (gaze à
      moustiquaire)

KiKongo	[polisi]	[mpɔlušɛ]	policeman
Fr	[šosɛt]	[nšɛ̌šɛ́tɛ̀]	socks
Fr	[müzɛt]	[mǘšɛ̀:tɛ̀]	box, bag

All of these words contain a source language alveolar sibilant which appears as an alveopalatal sibilant in the Tshiluba loanword. These examples, unlike the ones in (8), cannot be handled by Hyman's approach (that is, by considering them as underlying representations to which synchronic rules apply); although there is a synchronic rule in Tshiluba which palatalizes alveolars before i, the examples in (10) occur before [ɛ], and there is no rule which palatalizes sounds in this environment. There are, in fact, thousands of native words with unpalatalized sibilants before [ɛ] and no words for which one would posit a rule of palatalization in this environment. Clearly there is no synchronic phonological rule that could have applied to palatalize the sibilants in (10). If we assume that alterations in the forms of loanwords are normally not random or haphazard, then clearly we must have some linguistically plausible basis from which to work in order to account for these forms.[8]

At this point I will digress to introduce the type of descriptive device I would utilize in this case; then I will return to these forms and posit the specific solution I have in mind.

In a paper entitled "Loan words and abstract phonotactic constraints," Kaye and Nykiel (1979) present a refined version of Hyman's generative phonological borrowing theory in which they stress the importance of deep phonotactic constraints. I presume here that the terms that Kaye and Nykiel use, "deep phonotactic constraint" and "word structure constraint," are both essentially equivalent to the term "morpheme structure constraint". On the oter hand, surface structure constraints are strongly emphasized by linguists such as Shibatani (1973) and Picard and Nicol (1982). Certainly it is evident that phonotactic constraints (whether deep or surface) must play a large part in modifying the shape of some loanwords. For instance, in Tshiluba there is no evidence whatsoever for the existence of a synchronic phonological rule that inserts vowels in word-final position; nevertheless, it is very clear that conditions on the structure of words require that all words be vowel final.[9]

The phonotactic constraints that both Kaye and Nykiel (1979) and Picard and Nicol (1982) discuss are generally set up in the form of prohibitions, that is, as negative statements of what may not occur. As Kaye and Nykiel (1979:75) also point out, within one and the same language a particular negative constraint may be positively expressed in more than one way. Thus, in Japanese, the English source word strike has two expressions as shown in (11):

(11)   sutoraiki 'labour strike'   sutoraiku 'baseball strike'

Nevertheless, a language may prefer a relatively small subset of all of the linguistically possible positive expressions of a negative prohibition.

Thus, in Tshiluba two major strategies are used to comply with the prohibition against consonant-final words: a final vowel is added which is a copy of the preceding syllable vowel, or the final vowel [a] (less commonly [i]) is added. Note that the vowels [u], [ɛ], and [ɔ] are never final unless they are copies of a preceding vowel.

Therefore, I suggest that one should go further than negative constraints to set up <u>particular positive processes</u> which would describe the actual observed modifications. These sorts of processes I have designated loanword incorporation processes.

In the case of the data in (10), although there is no prohibition in Tshiluba against sequences of [sɛ], nor any synchronic rule which palatalizes [s] before [ɛ], this is certainly a universally common environment for palatalization. Although some of the loanword incorporation processes that I would posit for Tshiluba appear to derive from the synchronic system of the language, data such as those in (10) lead me to suspect that some modifications are also based on universally common tendencies such as assimilation. Thus, I posit that the examples in (10) are the result of a loanword incorporation process deriving (at least in part) from a universally common tendency toward palatalization, and that it is for this reason that the environment of the loanword incorporation process is extended beyond the environment of the synchronic palatalization rule. The synchronic rule for s would have the format shown in (12), while the loanword incorporation process would be formulated as in (13):

(12) $\quad$ s $\longrightarrow$ š / ___ $\begin{bmatrix} V \\ +high \\ -back \end{bmatrix}$

(13) $\quad$ s - - - - - > š / ___ $\begin{bmatrix} V \\ -back \end{bmatrix}$

The loanword incorporation process is, thus, more general that the synchronic rule (at least for s), and is strongly supported on the grounds of phonetic plausibility and universal occurrence.

2.2.2 The other instance I will discuss concerns the treatment of bilabial stops. Most commonly the bilabial stops in fully incorporated loanwords remain unchanged, as seen in (14):

(14) | Eng | [bɪskət] | [bìsíkítì] | biscuits |
      |-----|----------|------------|----------|
      | Fr | [batize] | [kúbàtí:zá] | to baptize |
      | Eng | [nʌmbə:] | [nómbà] | number |
      | Fr | [bulɜ] | [búlɔ́] | bolt, pin |
      | Fr | [patat] | [mpàtátà] | potato |
      | Eng | [pæn] | [mpánà] | frying pan |

Fr	[apεl]	[mpέ:là]	roll call
Eng	[pʌmp]	[mpɔ́mpɪ̀]	(bicycle) pump
Fr	[põmp]		

However, in certain cases source language words containing a p have instead a voiceless bilabial fricative in the Tshiluba forms, as seen in (15):

(15)	Fr/Eng	[su(w)p]	[nsúɸ̀ù]	soup
	Fr	[lɔpital]	[lùɸ̀ìtá:dʸɪ̀]¹⁰	hospital
	Swahili	[papa(y)i]	[dʸiɸaɸayi]	papaya
	KiKongo	[kapita]	[kàɸítà]	headman
	KiKongo	[dikopo]	[dʸíkɔ́ɸɔ́]	cup

In native Tshiluba words [p] and [ɸ] are allophonic variants, as shown in (16):

(16)	[lúɸású]	grasshopper	[mpású]	grasshoppers
	[ɸɛ̀ɸi]	near	[mpέlɔ́]	grinding stone
	[mùlɔ̀ɸɔ̀]	under-chief	[bímpὲ]	well, good
	[lúɸúmbέ]	red ant	[lùmpùndú]	drum

As is evident from these data, in native words [p] is found only after a nasal (which is always surface homorganic), while [ɸ] is found in any other position possible for a consonant in the language. The simplest and most natural formulation of this allophonic relationship would be as a synchronic assimilation rule, as in (17):

(17) $\phi \longrightarrow p \ / \ N \underline{\quad}$

Note, therefore, that there is no synchronic rule in the grammar which will change [p] to [ɸ]. However, there does appear to be a phonotactic constraint against the voiceless stop in any but a post-nasal position.

Hyman (1970) discusses several fairly precise principles that he uses to predict the shape of loanwords in Nupe. Although they are intended to be language specific and not universal, I find it interesting that the principle which applies directly to the above case predicts exactly the wrong result for Tshiluba. Hyman says that "when a foreign segment appears in an environment in which the equivalent native derived segment does not appear, then the form of the incoming foreign word is modified so that the structural description of that rule is met and the segment in question

is then derived in the appropriate environment" (Hyman 1970:40). As we know, the appropriate environment for p̱ is following m̱. If the Tshiluba data worked according to this principle, the form of the word would be modified (by the insertion of m̱) so that the sound in question (p̱) would now appear in the correct environment. In other words, Hyman's principle would predict forms like those in (18):

(18) *[dʸíkómpó]   cup   *[nsúmpù]   soup

Although Hyman's principle does not sound implausible as a method for incorporating loanwords (and certainly does describe Nupe), it obviously does not work of Tshiluba. It would seem that much more specific descriptive statements are needed for the particular languages being described; loanword incorporation processes are precisely these sorts of statements.

As we can see from the data in (14), loanwords in Tshiluba render a source-word p̱ as p̱ only if the word is also provided with a preceding nasal class prefix, as in [mpánà] 'frying pan' or [mpέ:là] 'roll call'. Thus, it appears that the representation of sounds in loanwords is dependent on their morphological classification into noun classes; that is, that loanword incorporations processes which are phonological are ordered after incorporation processes which are morphological.

Since there is no synchronic rule that will change source language p̱'s into bilabial fricatives, and since there also appears to be a phonotactic constraint that prohibits p̱'s in non-post-nasal positions, I will posit a loanword incorporation processes that changes [p] to [ɸ] in these disallowed cases. Remember that nasal + consonant clusters are the only consonant clusters permitted in native Tshiluba words; since syllables of the C_0V structure (in all but quite foreign-sounding loanwords), I can set up the loanword incorporation process to occur when source language p̱'s are syllable-initial in Tshiluba. In mp̱ clusters, of course, the syllable boundary will always precede the m̱ and never split the cluster. Thus, the process would have the form shown in (19):

(19)   p - - - > ɸ / . _____

3. Conclusion

Both in the case of palatalization before [ε] and the substitution of [ɸ] for [p], it is clear that the synchronic phonological rules of the borrowing language are alone insufficient to offer a solution. I do not think that it is surprising that this is so, since each act of borrowing is a one-time only diachronic event, not an ongoing synchronic relationship. Certainly it is clear that conditions on the structure of words must play at least a partial role. I have suggested that the positive descriptive devices (which I designated loanword incorporation processes) are an appropriate means of describing the precise results of such conditions. As well, it appears that languages can have recourse to phonetically plausible and universally common processes (such as assimilation) for loanword modifications, resulting in loanword incorporation processes which, I submit, are, therefore, quite natural.

NOTES

[*]This is an expanded version of the paper I delivered at the 1981 annual meeting of the Canadian Linguistic Association in Halifax, N.S. Some of the data derives from my work with two native speakers of Tshiluba, Remy Tshibangu and Benoit Tshiwala, for whose assistance I am sincerely grateful.

[1]This is somewhat of a simplification, since even uneducated speakers will use recent loanwords which are not highly nativized.

[2]High tones are marked ´, low tones `. If no tone marks appear, I have been unable to discover the tone pattern.

[3]Of course, tones are added as well, but in general the stressed (i.e., most prominent) syllable is given high tone, the most prominent tone.

[4]Note that the tone pattern on prefixes of loanwords is sometimes altered. Normally all noun class prefixes have high tone. In loanwords, however, the tone pattern usually seems to be as follows: high tone on syllables stressed in the source language, otherwise low tone (except for some two syllable French-derived words which have all high tones).

[5]Note that replacement of r is not obligatory, as seen in the word for 'fork'. This, of course, is merely a less fully incorporated word. Also possible is a complete deletion of the r as in 'grace' and in [nšapita] 'chapter' from French chapitre [šapitr̥].

[6]However, this is not to say that all of the phonological rules of the borrowing language must apply. The fewer the rules which apply, the less incorporated the loanword would be.

[7]In native Tshiluba the rule changes [t] to [č], [z] to [ž], [s] to [š], [d] to [dʸ], [l] to [dʸ], and [n] to [nʸ] before [i]. Note, however, that only [dʸ] and [nʸ] are allophonic variants; /č ž š/ must all be considered underlying since they can occur before vowels other than [i]: [čá:ýi] 'odd, uneven', [čɔ:bá] 'hit, strike', [díčù] 'ear', [šɛ́ɲɛ̌žá] 'polish', [ŋkàšà:mà] 'leopard', [mùšɔ̀:kɔ̀] a kind of fish, [zɔ:bɔ́ka] 'be pliable', [zú:ká] 'get up, rise'.

[8]Although only a handful of loanwords of the type shown in (10) occur, some explanation must still be offered. If the consonants had remained unpalatalized, they would be closer to their pronunciation in the source language. There can be no explanation in terms of the phonological rules of the language; there is no rule which palatalizes [s] to [š] before [ɛ]; both [sɛ] and [šɛ] are common sequences of sounds in native words.

[9]There is no eivdence that this is clearly either a deep or a surface constraint in Tshiluba. Perhaps it is what Shibatani calls a M/SPC (a morpheme/surface phonetic constraint), that is, one which holds at both levels.

[10]The word seems to be borrowed with the article: <u>l'hôpital</u>. The final
[1] becomes [d^y] before [i] according to the rule described in footnote
7.

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AFRICAN 'SHADOW VOWELS': A DESCRIPTIVE SURVEY*

Brent Vine

From the time of the earliest descriptions of many East
and Central African languages, one finds evidence for weakly
articulated vowels referred to variously as 'semi-mute vowels',
'vowel-colored breaths', or 'shadow vowels'. The precise phonetic
nature of these vowels -- which may be simply voiceless, or which
may involve various phonation types -- remains unclear, and de-
serves further study. But apart from the intrinsic phonetic in-
terest of these vowels, the available descriptions suggest phono-
logical behavior that is also potentially of some importance. The
Bongo-Bagirmi group of languages is particularly rich in phenomena
involving shadow vowels, and these are described in some detail.
Two patterns emerge: (i) in languages with both shadow vowels and
normally articulated vowels on the surface (such as 'standard'
Bagirmi), shadow vowels undergo processes (like deletion or assimi-
lation) to which ordinary vowels are not susceptible; (ii) in lan-
guages with <u>no</u> surface shadow vowels (such as Ngambay, and some
dialects of <u>Bagirmi</u>), certain vowels -- which, predictably, cor-
respond with shadow vowels in related languages -- behave <u>as if</u>
they were shadow vowels (i.e. as in (i) above). Finally, evidence
of this second pattern (which raises interesting questions about
the linguistic significance of such vowels in underlying represen-
tations) is presented from Alexandre's analysis of Bulu, in which
apparently epenthetic 'buffer' vowels are in fact phonologically
distinctive relics of the second vowel of original Bantu CVCV stems.

0.   According to Tucker and Bryan (1966:60), 'An outstanding characteristic
of the BONGO-BAGIRMI languages is that the final vowel of certain words is
<u>semi-mute</u>, i.e. pronounced so softly as to be hardly audible, and readily
<u>elided</u> before following sounds'. This is a phenomenon which has been docu-
mented since the earliest work on Bongo-Bagirmi, as can be seen in such
descriptions as the following:

(1a) Delafosse 1897:19 (for Sara):

Souvent en sara les voyelles finales sont excessivement brèves;
on pourrait même ne pas les prononcer, et elles disparaissent
parfois, dans les mots composés; comme ce n'est pas constant,
et que beaucoup de voyelles finales conservent au contraire
toute leur valeur, j'ai distingué les voyelles semi-muettes par
le signe ‿ qui marque la brièveté. Ainsi les mots <u>debĕ</u> homme,
<u>monŏ</u> enfant, devront se prononcer presque <u>deb</u>, <u>mon</u>, en faisant
à peine sentir la voyelle finale. Au pluriel on pourrait dire
et écrire: <u>deb ge</u>, <u>mon ge</u>.

Compare Gaden 1909:8 (for Bagirmi):

(1b) Le signe / placé en avant d'une voyelle, indique que cette
     voyelle disparaît dès que le mot n'est pas isolé ou en finale.
     Exemple:
          kag/a, arbre; kag muta, trois arbres.
     Quand ce signe est absent, le mot est invariable:
          kaga, panthère; kaga muta, trois panthères.

More recently, cf. Caprile 1968:9 (for Mbay):

(1c) En position faible ... la réduction des oppositions vocaliques
     est très importante. Le relâchement, la centralisation, la
     brièveté et jusqu'à un dévoisement partiel caractérisent les
     réalisations vocaliques dans cette position et rendent leur
     identification assez difficile ...

But this phenomenon is not peculiar to the Bongo-Bagirmi languages:
it has been observed in a variety of East and Central African languages,
such as Teso, Burunge, and Galla, with documentation, again, from some of
the earliest descriptions. For Galla, witness the following statement by
Praetorius (1893:4):

(2) Alle auslautenden unbetonten Vokale neigen zum Abfall. Sie können
    entweder 'ganz stummen sein, oder doch so kurz gesprochen werden,
    dass sie nur noch ein Hauch zu sein scheinen, immerhin aber so,
    dass der Vokal noch kennbar ist'.

The internal citation ('ganz stummen sein ... noch kennbar ist') indicates,
in fact, Praetorius' debt to still earlier sources (in this case a previous
description by Tutschek.)

The cumulative impression left by informal descriptions such as these,
as well as Tucker's more recent statement that the semi-mute vowels of
Galla are 'voiceless and barely articulated' (1967:661), is that we have to
do with phonetically voiceless vowels; compare also the traditional designa-
tions 'semi-mute vowel' and 'vowel-colored breath'. But precise phonetic
data on such Vs (including instrumental analyses) are so far lacking, and
it seems preferable to adopt, at least provisionally, the phonetically
neutral term 'shadow vowel' (due to Hilders and Lawrance 1956). Despite the
lack of such phonetic data, however, I would like to suggest that the
phonological behavior of these Vs, as seen in the available published de-
scriptions of the languages in question, is potentially of great interest[1].

The paper examines, then, the following areas: first, the behavior of
shadow vowels (henceforth Vs) in synchronic phonological systems, particular-
ly in Bagirmi; second, the behavior of Bongo-Bagirmi Vs from a historical/
comparative point of view; and third, a brief comparison of Bongo-Bagirmi
Vs with similar data elsewhere in Africa. The aim of the paper is not so
much to propose and defend 'unique' or 'correct' analyses of the data, but

rather to characterize the potential interest and importance of these
neglected phenomena, if only as a stimulus for future work, both
descriptive and theoretical.

1. In Bagirmi, Vs are susceptible to certain phonological processes which
do not apply to normally articulated Vs. First, Vs (the best examples in-
volve /a/) assimilate to bilabial or palatal nasal consonants of following
morphemes, as can be seen in the following alternations:

    (3) /aka/ 'see': m-aka 'I see, saw'   j-aku-ma 'they saw me'

                                               j-aki-ña 'they saw him'

        /ada/ 'give': m-ada 'l give, gave' n-ádù-m gà 'he gave me'

                                             m-ádí-ñ gà 'I gave him'

        /tada/ 'work, do': ma m-tada 'I do, did'   tádí-ñ 'do it!'

Compare /aca/ 'cut', which does not have a V:

    (4) /aca/ 'cut': m-aca 'I cut'   m-acá-ña 'I cut it' (etc.)

    Before non-nasal consonants of following morphemes, and before the
dental nasal [n], Vs are deleted; compare the following forms from the
paradigm of /ada/ 'give' with the assimilated forms n-ádù-m gà 'he gave
me' and m-ádí-ñ gà 'I gave him' in (3) above:

    (5) /ada/ 'give': n-áj-jè 'he gave us'

                     n-át-sè 'he gave you (pl.)'[2]

Some further examples are provided in (6) (note the morpheme-initial [n]
in the first item; morpheme-initial [ŋ] does not occur):

    (6) maŋo 'head of cattle' →   maŋ-ne 'cow'

         bɪsi dog'   bɪs-ge (bɪz-ge) 'dogs'

         kágá 'tree'   kag-ge trees'

         tádá 'work, do'   tád-kí 'work! (pl.)'

         ŋáŋá 'tooth'   ŋáŋ-la 'chew'

         abe 'go, leave'   ab-se 'carry oft'

    V-deletion is in fact more general, and applies across word-boundary
(including compound-boundary), even if the following word begins with a
bilabial nasal:

(7) kamo̱ 'eye   ⟶   kám kàgá 'leaf' (lit. 'eye tree')
    tòtò̱ 'hill'   tòt mbásá 'stone' (lit. 'hill small')
    ŋaba̱ 'man'   ŋab ga 'man who'
    tádá̱ 'work, do'   m-tád gà 'I have done'
    bogo̱ 'steal'   mala bog ja 'the master (who) stole the meat'
    kágá̱   kág mùtá '3 trees'

(There are no examples before the palatal nasal [ñ], which does not occur word-initially.)

In contrast, ordinary Vs do not delete before following morpheme- or word-initial consonants (cf. also (4) above):

(8) kàgà 'leopard'   ⟶   kaga-ge 'leopards'
    ŋáŋla 'chew'   ŋáŋlà-ki 'chew! (pl.)'
    ali (n. prop.)   ali-ge 'people named Ali'
    màrà 'crocodile'   màrà ngóló 'big crocodile'
    gwoto 'be absent'   ne gwoto lolo̱ 'he is not here'

In Sara and Kenga, preconsonantal Vs behave somewhat differently: according to Tucker and Bryan (1966:63), the preconsonantal V̱ deletes, as in Bagirmi, but this leads to a further development, namely the insertion of a syllabic nasal consonant, homorganic to the preceding consonant:

(9) Sara: bɔ́ba̱ 'male'   ⟶   bɔ́bm̩-maŋ 'bull' ('male-cow')
    Kenga: màkà̱ 'belly'   da-màkŋ́-kaba 'carnivore'
                               ('meat-belly-wild animal')
         kɔsɔ̱ 'food, eat'   kɔsn̩ kɔ̀s 'to eat food'

(Both Vs and V̱s generally elide before following Vs.)

A somewhat different situation is found in other dialects of Bagirmi, as can be seen from field work of J. Lukas, as reported in Tucker and Bryan. In the material designated 'Lukas 1' in Tucker and Bryan's corpus, from a single village, no V̱s are recorded for many words which consistently have a V̱ elsewhere in Bagirmi; these forms exhibit, instead, normally articulated Vs, as in the forms in (10):

(10)   'standard' Bagirmi   Lukas 1

    kágá̱ 'tree'   kágá
    ʔaŋa̱ 'sheep'   àŋá
    ími̱ 'locust'   ìmí
    ɪjɪ̱ 'urine'   ɪjí
    mùjú̱   mùjú

ʔʌmų̱	'nose'	àmú
ulų̱	'swallow'	ùlú
élę̱	'bird'	èlé
dɛbę̱	'person'	dèɓé
k-abę̱	'journey'	k-àɓe
maŋǫ̱	'head of cattle'	màŋó
osǫ̱	'bite'	ósó
ʔabǫ̱	'hippo'	àfó
ŋonǫ̱	'child'	ŋónó

Nevertheless, such 'Lukas 1' forms undergo the same processes described
for Vs above, while 'Lukas 1' forms which correspond to Vs elsewhere do
not. For assimilation, consider the form 'bite' illustrated in (11):

(11) <u>Lukas 1</u>

    ìñí 'snake' + oso 'bite' :   ìñ ósú-má 'the snake bit me'
                              ìñ ósí-ñà 'the snake bit him'

For deletion, consider the forms in (12):

(12) <u>Lukas 1</u>

/ìñí#òsó+jè/	→	ìñ òs-jè 'the snake bit us'
màŋó 'head of cattle'		màŋ-né 'cow'
dèɓé 'person'		dèɓ-gé 'people'
ùlú 'swallow'		m-úl gà 'I swallowed'

    In the dialect of still another village, designated 'Lukas 2', final Vs
of any kind are altogether missing, as can be seen from forms like those in
(13) (the corresponding forms from (10) above are repeated for convenience):

(13) 'standard' Bagirmi		Lukas 1	Lukas 2
kágá	'tree'	kágá	kák
ʔaŋa̱	'sheep'	àŋá	aŋ
ímį̱	'locust'	ìmí	ìm
ʔʌmų̱	'nose'	àmú	ʌm
élę̱	'bird'	èlé	èl
dɛbę̱	'person'	dèɓé	dèɓ
maŋǫ̱	'head of cattle'	màŋó	màŋ
ʔabǫ̱	'hippo'	àfó	àp
ŋonǫ̱	'child'	ŋónó	ŋón

Descriptively, then, we find in Bagirmi the following three synchronic situations:

(i) In the dialect of what may be called 'standard' Bagirmi, V_xs are phonetically distinct, on the surface, from other Vs.[3] The fact that V_xs are distributionally restricted, however, could be taken as an indication that such Vs are underlyingly not distinct from other Vs, and result from some low-level process (whether optional, obligatory, or 'variable') which applies to Vs in word-final position. One might claim, for example, that phonetic V_xs arise automatically in unstressed word-final position, while final stressed Vs remain unaffected: thus Bag. ['kágá] 'tree' versus [kà'gà] 'leopard'. It appears, however, that in the Bongo-Bagirmi languages generally, 'stress is normally on the first syllable of disyllabic words, and invariably so when the second syllable contains a semi-mute vowel' (Tucker and Bryan 1966:64). Thus, while it is probably true that V_xs are never stressed, most other final Vs are likewise generally unstressed, resulting in actual surface contrasts like Bag. ['kágá] 'tree' versus ['kàgà] 'leopard'. Apart from stress (which seems, moreover, to have no linguistic significance whatsoever in Bongo-Bagirmi), there are no other known factors which might condition the realiza-tion of Vs as V_xs.[4] In similar fashion, one could claim that V_xs are automatical-ly inserted, under certain conditions. There are two immediate problems for such an analysis: first, while the vowel quality of V_xs is identical to that of the V of the preceding syllable in a large number of cases, such that one might wish to envisage (e.g.) a copying relationship, this is by no means a general fact; second, the tones appearing on V_xs do not appear to be predic-tably related to any word-level features, including the nature of the pre-ceding consonant. But the major obstacle to this and similar analyses is the fact that V_xs regularly undergo certain phonological processes which normal Vs do not. As an alternative, it may be necessary to consider V_xs as under-lyingly distinct from other Vs, i.e. specified by some (perhaps laryngeal) feature or features, depending on their precise phonetic realization. This sort of situation, while typologically somewhat rare, is not excluded (given, e.g., the existence of systems with distinctive laryngealized or murmured Vs); one may further compare, in fact, the nasalized vowels of the Sara languages (a subgroup of the Bongo-Bagirmi languages), which must be taken to be underlying (i.e. not derived from sequences of oral vowel plus nasal consonant), a situation which I have discussed elsewhere (1978).

(ii) In contrast with the 'standard' Bagirmi situation outlined in (i), the dialect referred to as 'Lukas 1' shows a more complex situation. Both V_xs and certain normal Vs (the latter corresponding to V_xs in 'standard' Bagirmi) undergo those processes restricted to V_xs in 'standard' Bagirmi. It is difficult to know how to account for such a situation. On the face of it, one is tempted to claim that the state of affairs in 'Lukas 1' is an arti-fact of faulty description: perhaps the forms with apparent V for V_x (like those in (10) above) really have phonetic V_xs, in which case 'Lukas 1' is identical with 'standard' Bagirmi. But there is evidence, as we shall see, in favor of taking the description of 'Lukas 1' at face value -- i.e., evidence that a functional equivalence, as it were, of Vs and V_xs is possible, and linguistically significant.

(iii) Finally, Vs are altogether absent in the dialect referred to as
'Lukas 2', posing no particular problems for the synchronic analysis, but
indicating certain interesting consequences for the comparative and dia-
chronic analysis of Vs in the Bongo-Bagirmi languages, to which we now turn.

2. From a comparative perspective, the Bongo-Bagirmi languages as a whole
pattern, with respect to Vs, much like the dialect situation internal to
Bagirmi, as described above. Thus, some languages contain Vs which behave
much like those in 'standard' Bagirmi (e.g. Bongo, Baka, Yulu, some dialects
of Sara, etc.; cf. n. 3), while others appear to contain no reflexes of Vs
at all, as in 'Lukas 2' (e.g. most of the dialects of 'Sara proper', i.e.
Tucker and Brvan's 'Sara Mbai'). But most interesting are those languages
comparable to 'Lukas 1', in which Vs are phonetically nonexistent, but in
which certain phonological effects must be interpreted as traces of Vs.

In Ngambay (cf. Vandame 1963, Thayer and Thayer 1971), no Vs are re-
corded. Nonetheless, certain final Vs behave like Vs, from the standpoint
of e.g. Bagirmi. Consider first certain facts involving word-final /-ə/
in Ngambay.

According to Vandame (1963:13), it is sometimes difficult to dis-
tinguish a real word-final phonemic /-ə/ from an automatic stop-release,
particularly when the [-ə] bears the same tone as the V of the preceding
syllable. He proposes to make the distinction on the basis of the behavior
of [-ə] before following Vs, as follows: prevocalic V-elision is not ob-
ligatory, especially in deliberate speech, and yet some [-ə]s consistently
elide before Vs, while others consistently do not. Those words in which
[-ə] always remains on the surface are taken to contain /-ə/, while the
[-ə] which consistently elides in other words is taken to represent a stop-
release. Thus, the words for 'grain' and 'tree' show identical preconsonan-
tal realizations, with respect to word-final [-ə]:

(14) [kándə̂ tò dá] 'The grain is where?'

      [kāgə̄ tò dá] 'The tree is where?'

But their prevocalic realizations differ, as follows:

(15) [kándə̂ òsō nàŋ] 'The grain fell to the ground.'

      [kāg òsō nàŋ] 'The tree fell to the ground.'

Thus 'grain' is analyzed as /kándə̂/, while 'tree' is analyzed as /kāg/, with
a stop-release appearing in preconsonantal position, as in (14).

But this analysis is somewhat misleading, once comparative evidence is
considered. Vandame does not seem to have noticed that the word for 'tree',
for example, corresponds to forms with V elsewhere in Bongo-Bagirmi, thus
Bagirmi kágá, Bongo kaga, Yulu kage.[5] We are dealing, then, in all likeli-
hood, not with a simple stop-release, but rather with a phonological proper-
ty of certain historical Vs, which surfaces in some environments. Vandame's
analysis, if synchronically correct, would thus be the result of a restruc-
turing, whereby forms like *kāgə̄, with -V, together with a prevocalic V-dele-

tion rule, were reanalyzed as /kāg/, with a preconsonantal ə-insertion rule. But it is at least worth considering the more abstract analysis, whereby surface [-ə#] < *-ə and surface [-ə#] < *-ə̀ are still underlyingly distinct, comparable to the situation in the 'Lukas Î' dialect of Bagirmi, as outlined above.

A second indication of the linguistic significance of Vs in languages which do not distinguish them phonetically concerns certain word-final tone-bearing sonorants in Ngambay. According to Vandame (1963:37-8), liquids and nasals in initial and intervocalic position automatically bear the tone of the following V. In word-final position, however, certain liquids and nasals bear unexpected tones. Vandame attempts to account for these by invoking sentence-sandhi (i.e. influence, in this case, from following V-initial words) or some sort of conditioned influence from preceding Vs. Unfortunately, Vandame does not provide sufficient data to justify a detailed analysis at this time. There is reason to believe, however, that the explanation for such 'unexpected' tones -- once again, from a historical point of view -- is that they reflect traces of Vs. Thus Ngambay /màn/ 'water', realized either as [màn] or [màn], is not to be separated from Bagirmi mane, Bongo mini, Yulu mimi, etc. Essentially the same process is quite transparent in the Ngambay first person suffixed pronoun, the only case, significantly, in which a tone-bearing sonorant is distinctive: thus Ngambay -m̄ 'me' corresponds to Bagirmi -má. (Note also that in this way, it is possible to make some sense of Tucker and Bryan's remark (1966:64) that in those dialects of Sara with phonetic Vs, no Vs are found after liquids and nasals.)

3. Turning now to languages outside of the Bongo-Bagirmi group: there are indications that Vs represent an interesting 'areal' feature of sorts, which appears in several diverse forms.

Very little material is available concerning Vs described as Vs throughout the rest of the linguistic area covered by Tucker and Bryan, namely the Vs asserted to exist in Burunge, Geleba, Krongo, the Teda-Tubu dialects, Shilluk, Teso and Galla. The available evidence, however, indicates that Vs in these languages have essentially the same properties as Vs in the Bongo-Bagirmi languages, namely (i) they are restricted to word-final position; (ii) there are no restrictions as to which consonants may precede them; (iii) they may be tonally distinct from preceding Vs in the word, although they are often identical in quality to the V of the preceding syllable; (iv) they tend to elide more readily than normal Vs; (v) they appear, in related languages or dialects, either as zero or as normal Vs.[6] Although Vs are evidently not phonologically distinct in certain of these languages, minimal contrasts like those in (16) indicate that they may somehow be distinct at least in Galla:

(16) 'person'   acc. nāmà̰   dat. nāmà (m.)

      'girl'   acc. íntālà̰   dat. íntālà (f.)

      'this/these' acc. kánǎ̰   gen. kánǎ (m.)

But more interesting, from a broader, typological perspective, are
languages with no trace of phonetic V̥s, but which present phonological be-
havior reminiscent of V̥s, and which should perhaps be further investigated
in this light. I would like to suggest that such a case is represented by
Bulu, a Bantu language spoken in southern Cameroun, and thus roughly ad-
jacent to the southernmost extensions of Bongo-Bagirmi territory. The facts
in question have been discussed by Alexandre (1962), on which the following
summary presentation is based.

Several groups of Bantu languages of southern Cameroun are charac-
terized by a relatively high frequency of monosyllabic stems ending in a
closed syllable, corresponding to CVCV stems elsewhere. Typical languages
of this sort are Mbɛnɛ, Makaa, and Bulu. But, while e.g. Mbɛnɛ and Makaa
present, as a result, a high frequency of consonant clusters in actual
speech, this is not the case in Bulu; consider the following descriptions
(references in Alexandre 1962):

(17) 'A word ending in a consonant, when there follows another word
beginning with a consonant, requires a slight vowel sound after
it, making a little buffer syllable between the two words.' (Bates)

'When a word ends in a consonant, closely followed by another word
beginning with a consonant, Bulu speech very commonly inserts a
slight vowel sound between.' (Good)

Alexandre, however, has shown that this apparently anaptyctic 'buffer' V is
not the result of a low-level epenthesis, but a reflection of a segment which
is phonologically distinctive. While the quality of these 'buffer' Vs in Bulu
is nearly always identical to, or systematically related to, the quality of
the preceding V, their tones bear no such relationship. Moreover, the tonal
patterns of these Vs are functionally identical to those of the second V in
CV_1CV_2 stems. Finally, Alexandre suggests that the Bulu situation may repre-
sent an intermediate stage in a gradual attrition process affecting final Vs,
with the end stage, namely zero, represented in languages like Mbɛnɛ or Makaa.

This sort of situation is strongly reminiscent of the patterns outlined
for V̥s above, both with respect to their surface properties and distribution,
and with respect to their phonological behavior, as exemplified in particular
by the analysis of the so-called 'epenthetic' [-ə#] of Ngambay, involving
three-way contrasts like Bagirmi kágá, Ngambay (preconsonantal) [kāgə̄], Sara
kág 'tree'.[7]

NOTES

[*]This is a slightly revised version of a paper presented at the 10th
Annual Conference on African Linguistics, held at the University of Illinois
at Urbana-Champaign in April of 1979. An expanded version appeared in 1981
(see the REFERENCES), to which the reader is referred for extensive discussion
of some of the theoretical issues raised by the data.

[1]In addition to the data in Tucker and Bryan 1966:59ff., material from the Bongo-Bagirmi languages has been drawn from the following sources: Gaden 1909 (Bagirmi); Hallaire and Robinne 1959 (Sara); Caprile 1968 (Mbay); Vandame 1963, Thayer and Thayer 1971 (Ngambay); Santandrea 1963 (Bongo, Baka, Yulu, Kara). Tone is marked where known. For a more complete description of these and other relevant sources, see Vine 1978:119-20.

[2]The regressive assimilations exhibited by such forms are optional, or rather 'variable', and depend on such factors as speech style, speed of utterance, etc. For a similar situation, see Bolozky 1980:797 with respect to regressive voicing assimilation in Hebrew.

[3]The same situation is found in several other Bongo-Bagirmi languages, including Bongo, Baka, Yulu, Kenga.

[4]Tucker and Bryan (loc. cit.) note that 'occasionally stress is heard on the second syllable, when the first one contains a central vowel', while citing as an example Stevenson's description of Bag. kə̀lá 'snake' as phonetically [kə̀'lá]. Such forms would constitute, then, the only class of exceptions to the claim that stress in disyllabic words is initial. But one can also question the status of this class as 'exceptional', since the overwhelming majority of such CəCV forms (extremely frequent, for example, in Ngambay) have high tone on the final V. One wonders, then, whether the schwa of the first syllable (which characteristically has non-high pitch) and the concomitant high tone of the second syllable combine to give an impression of stress, which need not actually be present. It should be added that the distribution of /ə/ (as seen particularly in Ngambay) is by no means restricted to this position (CəCV); therefore, it would be problematic to claim, without further justification, that this /ə/ actually constitutes a 'reduction' of some full V, conditioned, in fact, by word-final stress. The problems associated with the status of /ə/ in these languages, however, are complex, and cannot be considered further here.

[5]It is along these lines that certain Ngambay forms in Thayer and Thayer's material, with tone marked on word-final obstruents, are probably to be understood, e.g. kāg̰ 'tree'. A number of such forms are consistently marked in this way by Thayer and Thayer, despite their claim that only Vs and nasals bear tone (1971:3.24). Thus Bag. mosу̰, Sara (dial.) masе̰, but Thayer and Thayer mε̄s̰ 'blood' for Ngambay; Bag. kesḛ, but Thayer and Thayer kέs̰ 'cough', etc.

[6]With respect to the last feature: an interesting situation worthy of further investigation concerns the Vs in certain Nilotic languages. In Shilluk, most verbs have the shape CVCV̰, whereas in (e.g.) Acoli, the corresponding verbs are of the shape CVCV, with a normally articulated final V. Nevertheless, this final V, which has no lexical value, seems also to be phonologically 'irrelevant': it never appears on the surface if a form undergoes any phonological process whatsoever, and may not belong in underlying representations at all. For details, see Crazzolara 1955.

[7]As a postscript, let me report the existence of independent work on issues very closely related to those treated above. In a letter dated July 14, 1980, Gerrit Dimmendaal informs me that his paper 'Non-voiced vowels in Turkana: a Nilo-Saharan feature?' (in Collected Seminar Papers 1979/80, ed. Franz Rottland: Dept. of Linguistics and African Languages, Univ. of Nairobi) argues that voiceless Vs in Turkana have phonemic status, on the basis of data concerning such factors as stress and tonal patterning. He notes, in addition, that his previous work on certain Nilotic languages (among them Teso and Shilluk, cf. sections 0. and 3. above, with n. 6) has led to similar conclusions. On the question of the phonemic status of voiceless Vs in a number of languages, see also my earlier discussion (1981:401-8).

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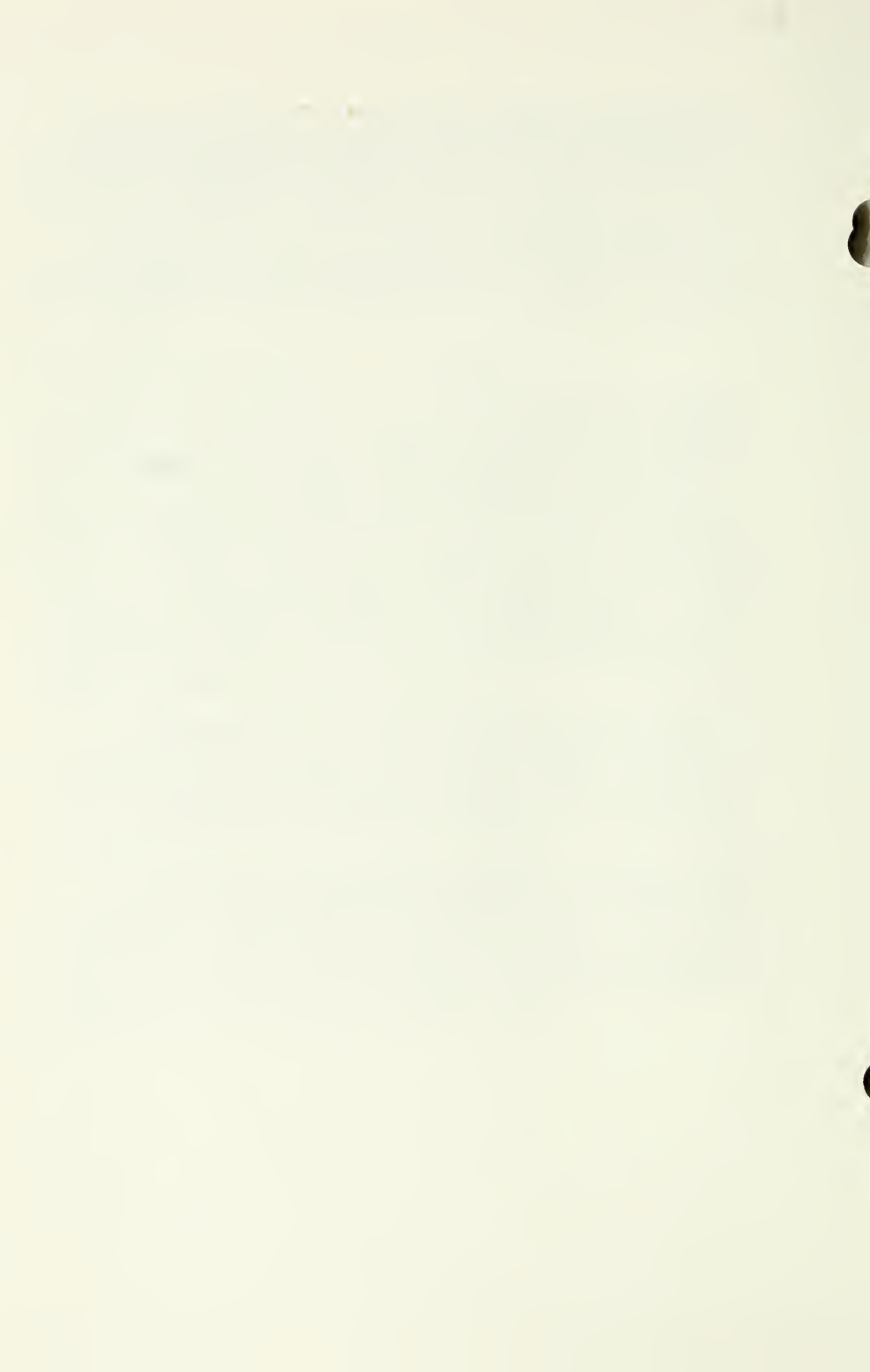
MODIFIERS IN BANTU: EVIDENCE FROM SPOKEN LINGALA [1]

Jennifer J. Yanco

The aim of this paper is to show that in Spoken Lingala
modifiers which have been categorized as adjectives can be
more adequately subsumed under the category noun. Hagege (1974),
in an investigation of adjectivals in some African languages,
claims that there is no universal word-class adjective, and
shows that in some languages words categorized as adjectives
behave like verbs, while in other languages, words categorized
as adjectives behave like nouns. He points to Bantu languages
as examples of the latter type. The question of whether modifiers
in Bantu languages should be considered nouns continues to be a
problem. Although there has been much discussion of this question
(see Welmers 1973: Chapters 9 and 10 for an overview), the issue
remains unresolved. In this paper evidence from Spoken Lingala
is presented--evidence which suggests that the words in question
can be most accurately categorized as nouns. In Spoken Lingala
any constraint on the distribution of modifiers is motivated by
interpretation conditions on the constructions in which they
occur and does not justify establishing a separate grammatical
category adjective.

The language investigated in this paper is the dialect of Lingala
spoken in the urban center of Kinshasa, Zaire, and referred to here as
Spoken Lingala. For increasingly large numbers of people living in
Kinshasa, as well as in Brazzaville (Congo), Spoken Lingala is a native
language. It is also widely used as a lingua franca among peoples living
along the Zaire River.

The origins of Lingala are unknown. Some attribute it to a now-
extinct ethnic group; however, attempts by Guthrie to support this claim
were unsuccessful (as reported by Bryan, 1959). Others see Lingala as a
trade language which developed along the Zaire River as a result of contact
among speakers of Bantu languages from Guthrie's Zone C, particularly
Bobangi. Whatever its origins, Lingala has been an important contact
language along the Zaire River since before colonial times. This
importance continued during the colonial era, the turning point for Lingala
coming in 1929, when it was declared the official language of the armed
forces of the Belgian Congo. This had the effect of spreading Lingala's
sphere of influence throughout the nation. On two occasions previous to
this (1918 and 1920), attempts were made to institute Lingala as the
official language of the Belgian Congo (Sesep 1978:64). In more recent
years, its importance has increased greatly as it has become the native
language of expanding numbers of people in Kinshasa and Brazzaville. Nor

should one overlook the role of popular music in spreading the language. Lingala is the language of 'Congolese music'--music which enjoys immense popularity throughout Zaire and Africa as a whole.

A characteristic feature of Bantu languages is their system of alliterative concord. In this system, each verb agrees with its subject noun in class, number and person; and every variable modifier agrees with its head noun in the same way. Such agreement is usually marked by prefixes. Spoken Lingala is unusual among Bantu languages since much of the system of alliterative concord found in other Bantu languages has been lost (as noted by Bokamba 1976, 1977; Ellington 1974, Guthrie 1951).

In the following discussion, I examine words which 1) have qualities as their referents and 2) can be used to modifiy nouns. The word modifier is used as a cover term to refer to these words; the symbol [X] represents them.

In some of the Bantu languages which have been analyzed as having a category adjective, the modification relation can be expressed syntactically by a noun immediately followed by a modifier which agrees in noun class with its head noun [N X]. The example below is from Swahili:

1. mi-ti   mi-kubwa
   N   X
   trees   big(ness)
   'big trees'

Although it has been suggested (Ashton 1944, Welmers 1973) that the words appearing in the [X] slot might be better categorized as nouns, they are still generally referred to as adjectives, primarily on the grounds that they immediately follow the nouns they modify and agree in noun class with their head nouns.

In another Bantu language, Lonkundo, the modification relation can be expressed syntactically in the associateive construction [N -a X], where the associative morpheme -a agrees in noun class with the head noun, but the modifier does not. The following example is taken from Welmers (1973:274).

2. bɛ-támbá   by-ǎ   bɔnɛ́nɛ
   N   assoc.   X
   trees   big(ness)
   'big trees'

Welmers analyzes the [X] in such constructions as nouns.[2]

In Spoken Lingala, the modification relation can be expressed by either [N X] or [N -a X], as shown below.[3]

3 a) nzete   monɛnɛ   3 b) nzete   ya   monɛnɛ
       N   X   N   assoc.   X
       tree   big(ness)   tree   big(ness)
       'a big tree'   'a big tree'

Both of the above constructions (3a and 3b) have the same meaning and the same distribution. For every construction [N X] in Spoken Lingala, there is a corresponding construction [N -a X]. While there is always a synonymous interpretation for the [N X] and corresponding [N -a X], there

may also be another interpretation for the [N -a X] , derived from the more complex [N -a N X].[4]

The associative construction is also open to the general class of nouns [N -a N].

    4. moto   ya   mbɔngɔ
          N   assoc   N
        person   money
        'a rich person'

and to the general class of verbs [N -a V]:

    5. likambo   ya   kokamwa
           N   assoc   V
        problem/   be amazed
          affair
        'a surprising affair/something amazing'

In keeping with the analyses which categorize the [X] in (3a) as an adjective (as in Swahili) and the [X] in (3b) as a noun (as in Lonkundo), traditional accounts of Lingala categorize monɛnɛ as an adjective in (3a) but as a noun in (3b). So, for Spoken Lingala, it is not a matter of distinguishing between modifiers which occur in [N X] and those which occur in [N -a X] , since the same modifier may occur in both constructions. Rather, it is a question of determining how modifiers should be categorized.

The characteristic Bantu system of agreement is shown in (6a) and (6b) below. These examples are taken from Standard Lingala (Bokamba 1977) and represent the general principle as it operates in Bantu languages.[5]

    6 a) e-lɔkɔ   e-nɛnɛ   e-kwey-aki   awa
          thing   big(ness)   fall past   here
        'A large object fell down here.'

    6 b) bi-lɔkɔ   bi-nɛnɛ   bi-kwey-aki   awa
          things   big(ness)   fall past   here
        'Large objects fell down here.'

Note that in the above examples, the verb agrees with its subject noun and that the modifier agrees with its head noun, as indicated by the underlined prefixes.

In Swahili, one of the criteria used in categorizing a word as an adjective is that it agree with its head noun, as in example (7) below.

    7 a) ki-su   ki-refu
          N   X
        knife   long/length
        'a long knife'

    7 b) vi-su   vi-refu
          N   X
        knives   long/length
        'long knives'

In Lonkundo, on the other hand, one of the criteria used by Welmers
in categorizing modifiers as nouns is that they usually do not agree with their
head nouns, as shown in example (8) below. (But see note 2.)

        8 a) j-ǒi   j-ǎ   i-sîsí
                N   assoc   X
              thing   small(ness)
              'a small object'

        8 b) ba-ói b-ǎ   to-sîsí
                N   assoc   X
              things   small(ness)
              'small objects'

In Spoken Lingala, modifiers appear in both [N X] and [N -a X]
constructions. However, the construction in which a modifier appears has
no bearing on its agreement with its head noun. Among modifiers in Spoken
Lingala, very few show any kind of agreement with head nouns; however, there
is a small group which are inflected for number, on the model of the mo/mi (3/4)
noun class.

                    [NX]   [N -a X]
        9 a) mwana mɔkɛ   mwana ya mɔkɛ   'a small child'
              bana mikɛ   bana ya mikɛ   'small children'
              *bana bakɛ   *bana ya bakɛ

        9 b) moto monɛnɛ   moto ya monɛnɛ   'a big person'
              bato minɛnɛ   bato ya minɛnɛ   'big people'
              *bato banɛnɛ   *bato ya banɛnɛ

        9 c) moto molai   moto ya molai   'a tall person'
              bato milai   bato ya milai   'tall people'
              *bato balai   *bato ya balai

Most modifiers, however, never show any kind of agreement with their head
nouns.

        10 a) mwasi kitɔkɔ   mwasi ya kitɔkɔ   'a beautiful woman'
               basi kitɔkɔ   basi ya kitɔkɔ   'beautiful women'

        10 b) mwana mabe   mwana ya mabe   'a naughty child'
               bana mabe   bana ya mabe   'naughty children'

The point here is that, in Spoken Lingala, agreement of modifiers and their
head nouns is independent of the construction in which they occur. Therefore,
analyses citing agreement of noun and modifier in the [N X] construction as
grounds for calling these modifiers adjectives will not work for Spoken Lingala.
    In Swahili, where the fact that modifiers agree with their head nouns
is used to justify a category adjective, there are, in fact, some modifiers
which never agree with their head nouns:

```
11 a)  ki-tabu    safi            11 b)  vi-tabu    safi
        N          X                      N          X
       book       clean(ness)            books     (clean(ness)
       'a clean book'                    'clean books'
```

Turning again to Lonkundo, where the status of modifiers as nouns rests partly on their lack of agreement with their head nouns, we find that some modifiers do in fact show noun class agreement with their head nouns:

```
12 a)  ba-nto    b-ǎ    ba-lɔ́tsi
        N        assoc    X
       people           good(ness)
       'good people'

12 b)  bǎ-na     b-ǎ    ba-bé
        N        assoc    X
       children         bad(ness)
       'naughtly children'

12 c)  ba-yá     b-ǎ    ba-tálé
        N        assoc    X
       palm            tall(ness)
           trees
       'tall palm trees'
```

As has been pointed out, agreement criteria brought to bear in making the distinction between adjectives and qualificative nouns are not entirely convincing. There are enough exceptions, i.e., cases of agreement in the [N -a X] construction (Lonkundo), and cases of non-agreement in the [N X] construction (Swahili), that the analysis appealing to agreement offers no relevant insights into the data.

It is also on the basis of syntactic distribution that it is claimed that modifiers are adjectives in Swahili, where they occur in the [N X] construction, but nouns in Lonkundo, where they appear in the [N -a X] construction. As shown in (3), modifiers in Spoken Lingala can appear in both constructions. On the basis of their distribution, one might conclude, as has been done in traditional analyses of Lingala, that modifiers in Spoken Lingala are both nouns and adjectives. However, in a theoretical framework where both categories are primes, it will clearly not do to have words which belong to both categories. The following distributional evidence is provided in support of the claim that all modifiers in Spoken Lingala are nouns, and that their adjective-like qualities would be better reflected by categorizing them qualificative or adjectival nouns.

Like nouns, modifiers can be the subjects of sentences and can also be further modified by possessives, as shown in the examples below where mbɔngɔ is a 'true noun' and mabe, a modifier:

```
13 a)  Mbɔngɔ    ya    ye    eleki mingi.
        N        poss.  V      ADV
       money     his/her surpass much
       'She/he has a lot of money.'
```

13 b) Mabe   ya   ye   eleki   mingi.
       X   poss   V   ADV
       bad(ness)his/her surpass much
       'She/he is exceedingly bad.'

In (14) molai which is a modifier, occurs in the same environment as mbɔngɔ which is a 'true noun.' Both are the object of a preposition:

14 a) Henri   aleki   Pierre   na   mbɔngɔ.
       N   V   N   Prep N
       Henry   surpass Peter   money
       'Henry has more money than Peter.'

14 b) Henri   aleki   Pierre   na   molai.
       N   V   N   Prep N
       Henry   surpass Peter   length/long, height/tall
       'Henry is taller than Peter.'

The one construction in which there is a distributional distinction between qualificative nouns $[X]$ which can occur in $[N\ X]$ and other nouns is the 'have construction':
$$\left[N \quad \text{have} \begin{Bmatrix} N \\ * X \end{Bmatrix} \right]$$
where –zala na ('be with') means 'have.' In this construction, substitution of an $[X]$ for an $[N]$ results in either an uninterpretable sentence or one with a rather strange interpretation:

15 a) Jean   azali   na   mbɔngɔ.
       N   V   N
       John   have money
       'John has money.'

15 b) Jean   azali   na   mwasi.
       N   V   N
       John   have woman/wife
       'John has a wife.'

16 a) *Jean   azali   na   monɛnɛ.
       N   V   X
       John   have big(ness)

16 b) *Jean   azali   na   mabe.
       N   V   X
       John   have bad(ness)

However, in example (17), it can be seen that in some cases, $[X]$ can be interpreted in the 'have construction', although the interpretation is a strange one or is attributed to a different construction altogether.

17.   Motuka   ya   ye   ezali   na   mpɛmbɛ.
       N   poss   V   X
       car   his/her   have   white(ness)

The above sentence was interpreted by some informants as meaning 'Her/his car is partly white.' (i.e., it has many colors, only one of which is white); while others interpreted it as meaning that there was something white (a can of paint or a piece of cloth, for example) in the car.

The unacceptable nature of (16a) and (16b) and the interpretations of (17) may be analogous to the strangeness of (18b) below:

18 a) Mwasi   oyo   azali   molakisi.
      N   Dem   V   N
      woman   this   be   teacher
      'This woman is a teacher.'

18 b) ? Mwasi   oyo   azali   nzete.
        N   Dem   V   N
        woman   this   be   tree
        'This woman is a tree.'

Both molakisi and nzete are clearly nouns, but only one of them is acceptable in the above sentence (ruling out, of course, metaphorical usage). This is further evidence that [X] is not of a different grammatical category than other nouns, but rather, is of a sub-category of nouns defined by the semantics of its referent. Any restrictions on its distribution in the 'have construction' are a result of its meaning.

If modifiers in Spoken Lingala are nouns, why are they the only nouns which occur in the [N X] construction? As noted earlier, for every construction [N X], there is a corresponding construction [N -a X] which can be interpreted as having the same meaning (and which may have another meaning as well).

19 a) ndako   monɛnɛ
      N   X
      house   big(ness)
      'a big house'

19 b) ndako   ya   monɛnɛ
      N   assoc X
      house   big(ness)
      'a big house'

However, the [N -a X] construction formed with non-qualificative nouns in the [X] slot and used to express 'adjectival' meanings does not have an [N X] correspondent.

20 a) moto   ya   mbɔngɔ   b)* moto   mbɔngɔ
      N   assoc N   N   N
      person   money   person money
      'a wealthy person'

It would appear that qualificative nouns are the only ones which can appear in the appositive [N X] construction. I would like to suggest that this is because the construction as a whole is subject to certain interpretation conditions—conditions which do not apply to the associative [N -a X] construction. It would appear that what distinguishes the [N X] from the

$[N$ -a X$]$ construction is the type of relationship between the $[N]$ and the $[X]$ appearing in them. The appositive construction $[N \; X]$ may be reserved for those cases wherein the $[X]$ can be interpreted as being an inherent or basic quality of its head noun. This may also explain the restriction on the distribution of qualificative nouns in the $[\;N \; have \; X]$ construction which one informant claimed is reserved for temporary attributes or possessions which can be relinquished by the possessor.

In conclusion, modifiers traditionally categorized as both adjectives and nouns in Spoken Lingala can be more accurately categorized as nouns. In the $[N \; X]$ construction, they do not agree with their head nouns and, morphologically, many of them behave like nouns of the 3/4 (mo/mi) class. The fact that their syntactic distribution differs from that of other nouns (i.e., they can occur in the $[N \; X]$ construction, but cannot--or rarely-- occur in the $[N \; have \; X]$ construction) is due to the semantics of their referents. Subcategorization of modifiers as qualificative or adjectival nouns might allow us to predict which nouns could occur in the $[N \; X]$ construction, but it is not necessary. Semantic interpretation conditions on the construction constitute a sufficient constraint.

The behavior of modifiers in Spoken Lingala is noun-like. This can best be accounted for by a theory which provides a set of syntactic distinctive features defining the possible lexical categories of human languages (see Jackendoff 1977:29). Such a theory is capable of capturing the 'adjective-like' semantic quality of modifiers in languages where they behave like nouns as well as in those languages where they behave like verbs.

<div align="center">NOTES</div>

[1] This paper was prepared for the 10th Annual Conference on African Linguistics, held at the University of Illinois in the Spring of 1979.

[2] Lonkundo data in this paper are from Welmers (1973:273,4). According to one of the reviewers of this paper, the following $[N \; X]$ construction is also acceptable, and can serve as subject and as predicate nominal: be-tamba be-nene.

[3] The data from Spoken Lingala come from informants. I am grateful to the following people who have provided me with data and offered insightful comments on their language: Salikoko Mufwene, Lukaya Ntoya, Constance Ntoya, Bellamy Nignon, and Annette Onema Diawara.

[4] An example of this is the phrase mwasi ya kitɔkɔ, which may be inter- preted as meaning either mwasi kitɔkɔ or mwasi ya nzoto ('body') kitɔkɔ. The former refers to personal character/behavior, physical beauty, etc., while the latter refers only to physical beauty.

[5] Standard Lingala is the formal variety of Lingala and is taught in the schools, is used on the national and armed forces radios. Compared to Spoken Lingala, the use of Standard Lingala is extremely limited.

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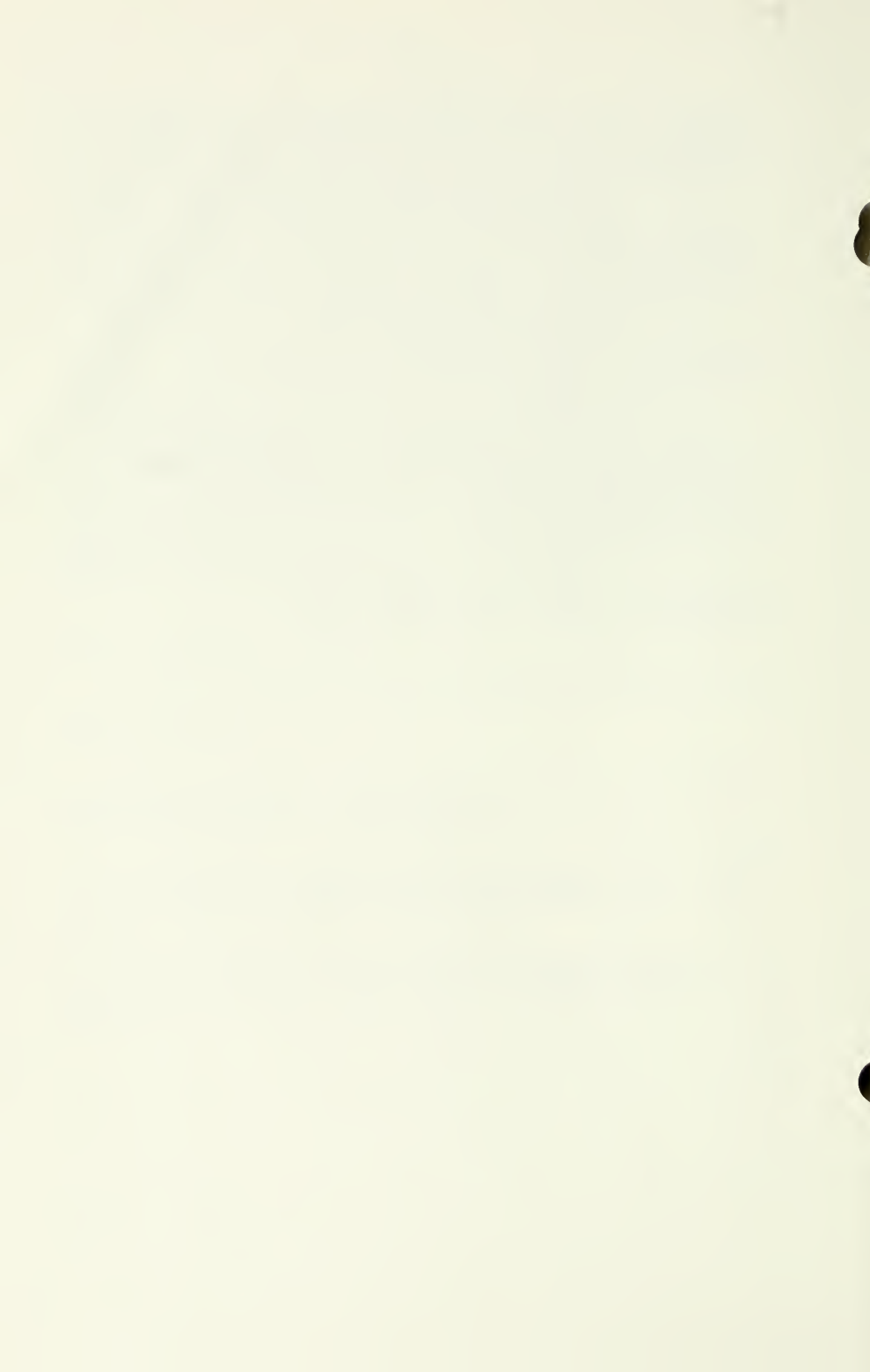
ARABICIZATION AND LANGUAGE POLICY IN THE SUDAN

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The aim of this paper is to examine the indigenization (Ara-
bicization) of language policy as opposed to the European language
policy in the Sudan. The political, socio-cultural and linguistic
aspects of the country are presented. The use of Arabic as a lin-
gua franca in relation to the use of the other indigenous languages
throughout the country is demonstrated, while the concept 'Arabici-
zation' is analysed in its socio-political and linguistic perspec-
tives. Against this background, language policy which is based on
the general policy of Arabicization to the exclusion of the indige-
nous languages is discussed. It will be shown that the Sudan is
deviating from the comprehensive language policy to adopt a totali-
tarian policy that favors one out of many ethnic groups of the same
country. It is argued, in this paper, that there is every reason
for the Sudan in particular and Africa in general to adopt a com-
prehensive language policy which assigns appropriate functions to
each lingua franca and the vernaculars wherever the need arises.
The paper concludes with strong support and an appeal for the re-
turn to a comprehensive language policy that is both realistic and
flexible.

1.0 INTRODUCTION

There is a growing awareness among the African countries for the need to
indigenize their language policies as opposed to the European language poli-
cies and to adopt a comprehensive language policy which assigns appropriate
functions to each lingua franca and the vernaculars. Such a language policy
is critical to the African system of education and cultural development (Bo-
kamba & Tlou 1976; Kalema et al. 1980).

Guided by comprehensive language policies, Tanzania, Somalia and Ethio-
pia have responded to this need by promoting and adopting Swahili, Somali and
Amharic languages, respectively, into official languages and by using them as
media of instruction in schools up to a certain level. In the Sudan, parti-
cularly in Northern Sudan, this indigenization policy has meant total Arabi-
cization of the school system, the mass media and the public communication
network to the exclusion of the other native languages of the country. The
Government has been leaning toward the adoption of a totalitarian language
policy based on the great policy of Arabicization, which simply means socio-
cultural and linguistic assimilation of the indigenous groups. In addition
to this, Arabicization has been emotionally associated with the political
and socio-cultural goal of the country. For example, a former minister of
interior, Ali Abdel Rahman, retorted one time in his policy speech concern-
ing the goal of the country, by saying:

> The Sudan is an integral part of the Arab World
> ... Anybody dissenting from this view must quit
> the country. [1]

Such expressions are commonplace political rhetoric as I will show in
this paper. The Arabicization policy in the Sudan is being popularized by
the central government in Khartoum against the other ethnic cultural groups.
As a result, the other Sudanese communities such as the Southerners [2] are
left without any option except to fight back. Thus, in 1963 a petition was
submitted to the United Nations by a group calling itself the Sudan African
Closed Districts National Union which stated that:

> Vernacular languages which were taught at lower
> schools were replaced by Arabic to be taught with
> "Koran", the Muslim Bible. Village schools where
> elementary subjects were taught have been closed
> down and replaced by "Khalwas" (Islamic schools)
> ... The slightest mistake done by a Christian pu-
> pil who is not attending Islamic lessons is enough
> to dismiss him from the school. Children in the
> South are made to study their lessons in Arabic at
> the early stages of education because the idea is
> to make Arabic the mother tongue. This we think
> is wrong according to educational psychology prin-
> ciples. The child should begin with his native
> language not a foreign one. [3]

The argument of this paper is that there is every reason for the Sudan
in particular and Africa in general to adopt a comprehensive language policy
which assigns appropriate functions to each lingua franca and vernaculars
wherever the need arises.

2.0 GEOGRAPHIC, DEMOGRAPHIC, SOCIO-CULTURAL AND POLITICAL ASPECTS OF THE SUDAN

The Republic of the Sudan constitutes 967,000 square miles (the largest
in Africa) and is divided into nine administrative regions (See Appendix A,
Map); six in the Northern part and three in the Southern part of the country.
The total population of the Sudan is about 18 million (World Bank, 1980). Of
this number, six out of 18 million people are Southerners, while 12 million
are Northerners. Two predominant racial groups occupy the Sudan - the Arab-
ized Sudanese in the North and the Negroid people in the South. Ninety-five
percent of the Northerners have become Muslims and have been assimilated into
the Arab culture; the remaining five percent are Christians, who are also
greatly influenced by the Arab culture. In the South, ninety-six percent of
the population are Christians, one percent Muslim, and the remaining three
percent other.

There are 136 languages spoken in the Sudan; 114 are Sudanese, 14 origi-
nate from other African countries and eight, including English, are European
languages (Bell 1975; Thelwall 1978). Fifty-one percent of the Sudanese peo-

ple speak Arabic as their mother tongue; twenty percent of the population speak Arabic as their second language. In the South, however, only five percent of the Southerners speak Arabic (Southern Arabic) as their second language. Dinka, spoken by eleven percent of the Sudanese population, is the second major language in the country. Fourteen Sudanese languages, all classified as minor languages, are spoken by thirty-one percent of the total population. Although English is spoken by only one percent of the Sudanese population, this number represents a very influential segment, e.g., government officials, professionals, administrators, lecturers, etc.

Socio-economically and politically, the Southerners, who are by and large Christians, treat themselves as distinct from the Arabized Northerners. The distinction was understandably recognized by the British Colonial Administration and became embedded in the 'Southern Policy of 1930' [4] based on the following two premises:

> 1. That the Negroid Africans of the South were culturally and, to some extent, racially distinct from the Northern Arab Sudanese.
>
> 2. That the Southern provinces would either develop eventually as a separate territorial and political entity or be integrated into what was then British East Africa.

It was this attitude which was encouraged by the British colonialists that was predominant before the national reconciliation (1972), when the Southerners were granted local autonomy under one united Sudan. This North-South division between the Sudanese people is well summarized by Jaden (1965): [5]

> The Sudan falls sharply into two distinct areas, both in geographical area and ethnic group, and cultural systems. The Northern Sudan is occupied by a hybrid Arab race who are united by their common language, common culture, and common religion; and they look to the Arab world for their cultural and political inspiration. The people of the Southern Sudan, on the other hand, belong to the African ethnic group of East Africa. They do not only differ from the hybrid Arab race in origin, arrangement and basic systems, but in all conceivable purposes ....

3.0 USE AND DISTRIBUTION OF ARABIC VIS-A-VIS OTHER SUDANESE LANGUAGES

The use of Arabic relative to the other Sudanese and foreign languages has been placed on top priority for investigation in language surveys conducted by the Sudanese Government. The Institute of African and Asian Stud-

ies (IAA), University of Khartoum, among others, has been particularly pre-
occupied with the role of Arabic in the Sudan. Language studies and socio-
linguistic surveys have been carried out by many individual linguists such
as Stevenson (1962), Thelwall (1971), Mahmud (1983) and others. All point
to a similar conclusion, that although Arabic is predominantly used as a
lingua franca in the Sudan, it nevertheless is not and never will be a sub-
stitute for the vernaculars which are still serving very important communi-
cative roles, especially among the families in the rural areas of the Sudan.
For example, vernaculars are still the recognized vehicles of transmission
for folklore, traditions and local beliefs for the vast majority of the Su-
danese people.

One of the major language surveys of the Sudan was undertaken by Jernudd
(1972) in the six provinces of Northern Sudan. This survey also covered one
school area in the town of Adong, a small town in the Upper Nile Province in
Southern Sudan. In response to a question formulated to assess the parents'
(both fathers and mothers) ability to "chat along" in Arabic and the ability
to read and write, it was discovered that 90% of the fathers in Heiban, the
southernmost point visited in Northern Sudan, claimed knowledge of Arabic.
By contrast, only 40% are said to know Arabic in Adong, while the results
from the rest of the areas visited in Northern Sudan showed that almost all
of the fathers knew or spoke Arabic. The mothers' knowledge of Arabic var-
ies a little from one area to another; it is at its lowest in Adong (where
approximately one quarter of the mothers are said to know Arabic), and the
highest in the rest of the areas visited in Northern Sudan.

With regard to the use of Arabic and vernaculars in the homes, markets,
and offices, the survey pointed out that Arabic predominates in the markets,
schools and offices, but within the realm of home and family, the vernacular
languages predominate. In the Nuba Mountains (Heiban) and in Adong, the
younger people are influenced by school, and tend to use more Arabic than
the older people, particularly in the villages. The survey also found that
these young people, contrary to expectation, do still use vernacular langu-
ages just as much as the rest of the people in family settings and similar
contexts: With regard to this finding, Jernudd (1979:63), commented that:

> It should imply that Arabic is functioning well as
> a lingua franca in at least Northern Sudan ... the
> lesser influence of Arabic in the Southern part of
> the Nuba Mountains ... may be reflected with a very
> slight margin through the lower Arabic figures for
> Heiban. The much lower figure for Adong implies
> that Arabic may only be used for limited communica-
> tion with people who otherwise do not share langu-
> ages.

Another important language survey of the Sudan is that of Professor
Thelwall (1978). Given below is a chart from his work (1978:4) in which
he graded the provinces in terms of their degree of linguistic fragmenta-
tion.

TABLE I: LINGUISTIC CHART

Provinces in the North		Provinces in the South	
KHARTOUM		**BAHR-EL-GHAZAL**	
Arabic	96.0 %	Dinka	68.0 %
		Shilluk	4.6 %
BLUE NILE		Ndogo Sere	2.8 %
Arabic	84.0 %	Arabic	0.9 %
W. African	8.0 %		
		UPPER NILE	
NORTHERN PRO.		Nuer	52.0 %
Arabic	81.0 %	Dinka	25.0 %
Nubian	19.0 %	Shilluk	13.7 %
		Teso	4.8 %
KASSALA		Arabic	1.7 %
Beja	50.0 %	**EQUATONIA**	
Arabic	36.3 %		
W. African	11.0 %	Zande	23.8 %
		Teso	19.4 %
DARFUR		Bari	18.4 %
		Lotuko	13.0 %
Arabic	55.0 %	Moru	10.0 %
Fur	21.0 %	Bagirmi	4.0 %
Masalit	12.5 %	Bongo-Baka	3.0 %
Zaghawa	5.0 %	Arabic	0.6 %
KORDOFAN			
Arabic	68.0 %		
Nuba	26.8 %		
Koalib	9.0 %		

Thelwall's chart above demonstrates a wider role for the local vernacular languages throughout the country. In the Northern Province, Arabic is spoken by 81% of the population and Nubian is spoken by 19%; while in Kassala province, Arabic is spoken by 36.3% of the population, Beja is spoken by 50%, and Hausa and Fulani (from West Africa) are spoken by 11%. These figures show that:

> The numerical superiority of Beja at the province level contradicts the popular idea that multilingualism in the Sudan is restricted to the three Southern provinces and that elsewhere it is negligible (Thelwall 1978:8).

Not only is Beja holding the 'numerical superiority' at the provincial level, but it is also the vehicle of the folklore, oral traditions and poetry of the Beja people. Such an important linguistic role seems to constitute a cultural strength that is not directly affected or revealed by literacy rates

(Andrejewski 1968; Adarob 1972). Likewise, the "maintenance of Nubian as a first language among the Nubian peoples, is a proof of its cultural vitality in the face of a very long history of culture contact with Egyptian and later Arabic" (Shinnie 1978:82).

In the three Southern provinces, the use of Arabic is very insignificant with an average currency of 0.73% in each province. This percentage necessarily represents the town populations in the South who use Arabic as a lingua franca in context situations other than home. In the evaluation report of Southern Sudanese local languages (Cowan & Cziko 1984), the survey recorded that 93% of those interviewed felt most comfortable speaking their own vernacular languages, "but because of the heterogeneity of language usage in Southern Sudan, they sound it necessary to speak at least one or more additional languages." For example,

> If a Zande speaker is speaking to a person who speaks a vernacular he himself does not speak, or Arabic, they will use Arabic or another common language which they can both use and understand (Cowan & Cziko 1984:12).

The type of Arabic spoken in the South is, however, referred to as a pidgin-creole or Southern Arabic (Tucker 1934; Agwo 1975; Mahmud 1983; Yokwe 1984). In my article, "The Diversity of Juba Arabic" (Yokwe 1984), which was mainly descriptive of the grammatical aspects of Juba Arabic, the following observation was offered:

> Arabic is used invariably in situational contexts where one is not sure of the other's linguistic background. Thus, Arabic is taken as a lingua franca or assumed so, so that it is safer to talk to someone you do not know well in Arabic.

It must be emphasized here that this pattern of language use (Arabic-Vernacular) is only true within the town populations in the Southern Sudan. Outside the towns, in the rural areas, the vernaculars are predominantly used. In fact, Arabic is almost non-existent in the rural areas where the majority of the Southerners live. It is this linguistic situation, then which led the regional government to formulate its language policy for education in such a way that the major vernaculars are used as media of instruction within the first four years of primary schools in the rural areas (See Appendix B).

However, in the Northern Sudan, Arabic has been assigned the role of medium of instruction in all the pre-university schools. At the secondary school level, English is introduced as the second language but taught as a subject. There is no educational role assigned to the vernacular languages in the Northern Sudan; the reason being that the Arabicization language policy as practiced in the North, neither allows the teaching of vernaculars in

the schools, nor does it encourage their development. The assumption is that it is a waste of time to teach a child in his vernacular for a few years and then shift to a foreign language during the later stages of his school life. More will be said on this aspect in the coming sections. Before proceding to that discussion, let us first examine the concept of Arabicization and its logical implications as practiced in the Sudan.

4.0 CONCEPT OF ARABICIZATION AND ITS SOCIO-CULTURAL AND POLITICAL IMPLICATIONS

The term 'Arabicization' refers to several concepts. At one time, it referred to the process of racial, religious and cultural assimilation of the indigenous ethnic groups of the Northern Sudan; for example, the Nubians, Beja and other Negroid peoples by the Arabs. This process led to the Islamization and Arabicization of the six Northern provinces, leaving the South virtually untouched by these influences (Muddathir 1968:230). Thus, Islamization and Arabicization gave the Nubians, Beja and other Negroid populations of the Northern Sudan a unifying cultural bond which they did not possess before (Muddathir 1968). This view is widely held by the Northern Sudanese scholars who insist that "Arabism is a cultural, linguistic and non-racial link that binds together numerous races: black, white, and brown" (Beshir 1968; Muddathir 1968; Mazrui 1972).

The second concept of Arabicization is a political one. It is a deliberate attempt by the Northern politicians to identify and shape the future goal of the country toward Arab nationalism instead of African nationalism. As early as the 1930s [6] it was declared by one of the Northern leaders speaking for his party, that:

> Sudanese nationalism must be firmly based on
> Islam, Arabic culture, and African soil and
> traditions and that it should be opened to
> and freely interact with, international cur-
> rents of thought.

It remains to be know how this conviction was arrived at. However, similar politically motivated proclamations started to follow even after the Sudan became independent (1956). In 1965, for example, Sayed Saddiq el-Mahdi, a leader of the Umma Party (one of the Islamic sectors), characterized the Sudanese national image as follows:

> The dominant feature of our nation is an Is-
> lamic one and its overpowering expression is
> Arab, and this nation will have entity iden-
> tified and its prestige and pride preserved
> except under an Islamic revival. [7]

Many others, such as Dr. Hassan Turabi (Wai 1973), leader of the then Islamic Charter Front (another Islamic sector) had on several occasions expressed himself in a similar fashion. He argued that the South had no culture, so this vacuum would necessarily be filled by Arab culture under an Islamic revival.

This view dominated the discussion of the first and second constitution com-
missions in 1967 and 1968. One could go on and on enumerating these socio-
cultural and political conceptualizations of Arabicization by the Northern-
ers. Interestingly, some claims have become too ambitious and desperate in
their outlook. In one of his proclamations, Saddiq asserted that "The South
is a stepboard for Arab entry and Islamic influence into the heart of Africa"
(Vigilant, 1/16/1966,3). I personally find this overambitious in that most
of the African countries South of the Sudan or South of the Sahara, with the
exception of a few in West Africa, are nations that are mainly Christian in
religion and African in culture. It would be very difficult under the pre-
sent circumstances for such goals to be realized, particularly when the image
of Africanness is being subordinated to that of Arabdom.

The desperate state arises when the same person (Saddiq) in Vigilant
(1/16/1966,2), accused East Africa of conspiring against Islam and Arabism:

> Islam should influence the whole of Africa but
> 'there is a conspiracy in East Africa.' Here
> people believe they are Negroes, different from
> Arabs and must project their own personality
> and follow their own way. This belief underlies
> the affairs in the Southern Sudan at present.

Such a state of affairs challenges and contradicts the African spirit of
struggle against colonialism and foreign domination of the African states.

The third view of Arabicization policy is the linguistic role of the
Arabic language as a means for achieving national integration and unity of
the Sudanese people. The supporters of this view, which is widely held in
the Third World, believe that unity and national integration can easily be
promoted by the adoption and the usage of one national language. In the
case of the Sudan, obviously Arabic happens to be the language in question.
It is not only that Arabic commands the majority of the Sudanese people in
its role as a lingua franca, but that it actually complements the policy of
Arabicization. The Arabic language, being the mother tongue of the Arabs
in the Sudan is, therefore, bound to affect the outlook of the self-identi-
fication of the Sudanese nation as a whole.

Such is the conceptualization of the Arabicization policy upon which
language policy is based in the Sudan. Thus, it is not a coincidence that
the national language policy of the Sudan provides no room for the indige-
nous languages, particularly in the North where Arabic is mostly used as
an official language and as a lingua franca as well. It appears as if the
Arabicized Northerners themselves have given up the idea of developing and
preserving their mother tongues. The pressure from the national government
against traces of African culture, traditions and languages is overbearingly
too much. Indeed, the same pressure is now being exerted toward the South
which has been resisting the policy of Arabicization ever since the nine-
teenth century. This is not because English is preferred to Arabic by the
Southerners, but because of the vehement socio-cultural and political strings
which the Arabic language carries with it as it has been demonstrated above.

Thus, the Northern political outcry to denounce the African face of the country, in favour of the Arab one, alerts the Southerners to the danger that threatens their socio-cultural and linguistic heritage. As a result, the Southerners have always rejected Arabicization policy of any form, including linguistic form. They, however, support a language policy that is comprehensive enough to include the vernaculars in its structure and yet promote Arabic as a national language.

5.0 LANGUAGE POLICY IN THE SUDAN

5.1 <u>Language Policy in the North</u>. The existing language policy of the Sudan was decided on the basis of Arabicization policy: the pursuit of "Arab Nationalism" as the future goal of the Sudan. It is a national unity and integration sought in the "sentimental uniformities ... based on socio-cultural integration" (Fishman 1971:5). 'Arab Nationalism' was being adopted and transformed into the national language policy by the government, much to the exclusion of the rest of the languages and cultures of the indigenous people. In the North, it was easily done since the socio-cultural integration had already been achieved in the 17th and 18th centuries. The adoption of the Arabicization of the language policy was first declared on the eve of independence (1953) by the first Sudanese Minister of Education. Speaking in the National Assembly (Wai 1973:18) on behalf of his government he asserted that:

> As the Sudan is one country sharing one set of
> political institutions, it is of great importance
> that there should be one language which is under-
> stood by all its citizens. That language could
> only be Arabic, and Arabic must therefore be
> taught in all our schools.

Before the implementation of this policy in 1958, an event occurred which gave a sweeping mandate to the government to pursue its language policy. The policy was supported by a favourable recommendation on the use of Arabic as the medium of instruction in the secondary schools of the Sudan by the International Education Commission on Secondary Education (Commission Report, 1955). Among other things, the Report of the Commission stood against the use of vernaculars as media of instruction in schools and recommended Arabic to replace them. One of the reasons for recommendation was stated thus:

> It would be a waste of time and energy to try to
> teach the children of the South in their own Ver-
> naculars in which they will not be able to pursue
> any reading after they leave school: such Verna-
> culars have no literature and cannot be used as
> cultural media (Commission Report, 1955).

This particular version of recommendation became the most celebrated and most often quoted statement by the Khartoum governments and a number of scholars whenever the issue of language policy was discussed in the Sudan.

As late as 1963, a UNESCO expert, for example, re-echoed this allegation to a conference on Adult Education in the Sudan. He asserted that:

> The tribal languages of the South have no script
> of their own and even if the Latin alphabet is
> used for the different languages, there is no
> literature worth speaking of, which can be read
> with pleasure and profit. [8]

Such sweeping statements are indeed uncalled for, particularly when none of the speakers had knowledge of any Sudanese languages, given the fact that the Commission only spent six weeks in the Sudan including a few days in the South. Such an allegation was indeed the more lamentable particularly when the members of the Commission never bothered to find out for themselves what was going on in that area regarding the language situation (Sanderson et al. 1981). Indeed, as absurd as the report was, two of the members of the Commission, Sir Charles Morris and Miss Charlesworth, registered their precautions which the Sudanese Secretary [9] then excluded from the main body of the report. It appeared later in another document entitled "Summary of the Main Conclusions and Recommendations" (1955:144-5). Their suggestion was quite realistic and quite anticipatory of the later ideas of language policy concerning the South. The two recommended that where the vernacular is extensive and where there exists some literature and strong local sentiment, the vernacular should continue as the language of instruction in the earlier stages of primary education (The Commission Report, 1955).

As a result of the Arabicization policy, the use of Arabic was intensified in government institutions and public sectors, particularly in the North. Arabic is the language of religion used for prayers in the mosques and Christian churches. The Coptic Church holds services in Classical Arabic as spoken in Egypt. The Roman Catholic Church uses Colloquial Sudanese Arabic for its vernacular liturgy, and uses it throughout the Northern Sudan. In mixed ethnic congregations, the Anglican Churches use Colloquial Sudanese Arabic, but in single ethnic congregations, the relevant vernacular is used (Thelwall 1978). Most of the newspapers are in Arabic and three-quarters of the time of Radio Omdurman (the national radio station) is spent on broadcasting in Arabic. The Arabic language is also used on television, except when imported foreign language films are shown.

From 1958 onward, Arabic became the medium of instruction from primary schools up to the secondary level in the North. English is taught as a subject from intermediate school onward, and it remains the most common second language. It may be mentioned here that the Arabicization language policy was later reinforced by the permanent constitution of the Sudan (1973), written in both Arabic and English, which among other things stated that:

> Arabic shall be the official language for the
> Sudan and English the principal language for
> the Southern Region without prejudice to the
> use of any language or languages which may

serve as a practical necessity for the effi-
cient and expeditious discharge of executive
and administrative function of the Region.

Note that this constitution is one of the brakes against absolute Arabici-
zation policy, including language policy.

The constitution, properly referred to as 'The Southern Self-Govern-
ment Act (1972)' or 'Addis Ababa Agreement (1972)', resulted from the 17
years of civil war that took place between the Southerners and the North-
ern governments from 1955-1972. [10] This political document is embedded
in the national constitution as an organic law that allows the South to
form an Autonomous Regional Government within the United Sudan. As a
matter of fact, the central government has no language policy in the real
sense of assigning to language or varieties of a language social functions
within the respective communities. What the government has done is simply
to state the obvious: the Sudan is an Arab country and so Arabic is the
language for every function. No consideration is given to the other Afri-
can languages spoken in the North.

5.2 <u>Arabicization Policy in the South</u>. Arabicization in terms of
national integration by the process of socio-cultural assimilation of the
Southerners has had very little success. The Southerners, just like their
counterparts in the North, still remain a socially distinct community.
The socio-cultural and linguistic assimilative revolution that swept across
the North Sudan in the 17th and 18th centuries seemed to have lost its mo-
mentum toward the South. Nobody has come up with a definite answer based
on solid research as to why this gap between Northerners and Southerners
is still so wide and deep. From my own point of view, I think that the
most deep-rooted problem between the two sides is the lack of 'trust' in
one another. There are several factors which have contributed to this dis-
trust, including the bitter history of slavery. The most important factor,
however, is the lack of respect, by Northerners, for the Southerners'
rights, culture, and beliefs.

Specifically, in some communities self-dignity and respect are easily
and readily sacrificed for bread and butter or for political position or
money. In the South and among the majority of the various ethnic groups,
the reverse is true: self-dignity and respect come first and other things
follow later. Our Northern friends who claim the Islamic civilization seem
to behave contrary to the expectations of the Southerners. They expect the
Southerners to readily give up their cultural and traditional values in ex-
change for Arabdom and when the response is not forthcoming, they resort to
either force or hatred. As Beshir (1968:80) notes, "when the parliamentary
system disappeared, and political parties were suppressed, the advocates of
compulsion and integration of the North and South by force of arms had the
upper hand."

The military regime of 1958, which most Southern officials of that
time considered as a conspiracy by Northerners, was a monopoly of the Arab
North. Although political opposition was suppressed on either side, the
military regime set out to carry the policy of Arabicization on full scale
in the South. According to Beshir (1968:81), the military regime:

Stepped up the spread of Arabic and Islamization, in the belief that this was the only way to achieve unity in the future. A number of Koranic schools were established in different districts and Islamic priests were appointed. Six intermediate Islamic institutes were opened in Juba, Kodak, Wau, Maridi, Yei, and Raga. A secondary Islamic institute was opened in Juba, and centers for preaching and religious instruction for adults were also established. The military governors and administrators devoted much of their time and energy to spreading Arabic and Islam and to suppressing the opposition.

This prolific attempt to assimilate the South was done under the pretext that it was the only way to achieve unity in the future. Such a kind of unity was doomed to failure because there was nothing to unite. The Southerners, most of whom were already Christians, found themselves faced with a "clear and conscious choice between two rival religious, ethnical and cultural systems" (Sanderson et al. 1981:394).

However, a quick glance at Tables II, III and IV below and on the next page, will show that the other government institutions, including the schools, police, and army, remained a monopoly of the Northerners (Alibino 1970).

TABLE II:

GOVERNMENT SECONDARY SCHOOLS FOR BOYS
IN THE SUDAN - SHOWING EXPANSIONS

Period	No. of Schools in North	No. of Streams in North	No. of Schools in South	No. of Streams in South
Before Independence	4	14	2	3
Added after Independence	18	45	nil*	3
Total	22	59	2	6

*Malakal Secondary School, which bears the name of a town in the South which was opened in Omdurman in 1962, has now been absorbed into Wadi Seidna Secondary School.

TABLE III:

INTAKE TO THE SUDAN POLICE COLLEGE

Years*	No. of Northerners	No. of Southerners	Total
1950	10	3	13
1951	14	4	18
1953	13	7	20
1957	27	3	30
1960	29	nil	29
1961	36	1	37
1963	26	1	27
1964	35	2	37
Total	190	21	211

*There was no intake in 1952, 1954, 1955, 1956, 1958 or 1959.

TABLE IV:

OFFICERS COMMISSIONED IN THE SUDANESE ARMY

Date Commissioned	No. of Southerners	No. of Northerners	Total
27.7.1954	1	19	20
1.8.1955	3	45	48
1.4.1956	3	35	38
1.7.1957	3	40	43
1.5.1958	2	58	60
1.5.1959	1	56	57
1.5.1960	2	58	60
1.1.1962	nil	64	64
1.1.1963	1	56	57
1.1.1964	nil	71	71
1.1.1965	4	67	71
Total as at 1.1.1965	20	569	589

While the statistics in Tables II, III and IV are twenty to thirty years
old, very little has changed in this pattern of development: the Northern
part of the country continues to be the target of attention. The figures

in these tables indicate that the government policy has certainly been fa-
vouring the Northern region.

The attitude of the North toward the South is a mixture of hatred and
disrespect, and this is the biggest factor that has contributed to the fail-
ure of the policy of Arabicization in the South. This view is supported in
several studies in the literature. Henderson (1965:153) states in this re-
gard, for example, that:

> One thing they shared was a common contempt
> for the Southerner as an inferior being,
> coupled with complete indeference to his re-
> ligious ideas, ethics and standard behaviour,
> his social and tribal pattern.

Another interesting observation was indeed made as part of the 'Report
of the Commission of Inquiry (1956)' [11] formed by the government. The Com-
mission states, in one of its sections that:

> It is unfortunately true that many Northern
> Sudanese especially from among the educated
> class, regard the Southerners as of an infer-
> ior race, and the Gallaba (Northern traders)
> in Southern Sudan form no exception to this,
> as the majority of them are uneducated. The
> traders refer to the Southerners, and often
> call them 'Abeed' (slaves). This practice
> of calling Southerners 'Abeed' is widespread
> throughout the three Southern provinces. It
> is certainly a contemptious term, and is a
> constant reminder to the Southerners of the
> old days of the slave trade.

On the other hand, many Southerners also seem to be contemptious of North-
erners, as is shown by the terms Mundukuru and Minga which they occasionally
use to refer to them. The two terms are nicknames given to the Northerners
by the Southerners, in reference to the Arab traders in the South whose in-
terest in making money is so great that they subject themselves to such sim-
ple food as kisera 'Sudanese pancake' to be taken with water and salt. Over
the course of time, however, these words were used for demeaning any North-
erner, particularly when a situation is provoked. Apparently the Southerners
have learned the fact that the Arabized Northerners like to be called Arabs
despite the fact that they are not. To deny the Northerners that claim, the
terms Mundukuru or Minga are substituted for the term 'Arab'. When used in
this context, the terms mean 'Arab mulatos' or 'Arab half-castes'.

The end result of all of this bitterness was the seventeen years of
civil war (1955-72) that brought about the formation of the Regional Govern-
ment within the United Sudan. And with the Addis Ababa Agreement (1972), the
old chapter was closed and a new one opened. What it really meant was that
unlike the situation in the North, the socio-cultural policy of Arabicization

had failed to a large degree in the South. However, linguistically, the role of Arabic as a national language has been preserved. The Arabic language is not new to the people of the South: it has been known to the South ever since the Anglo-Egyptian rule. Tucker (1934) commented on "Southern Arabic" as being widely spread throughout the Southern Sudan. The colonial government (Southern Policy 1930:4) ruled that English instead of Arabic be used where communication in the local vernacular was impossible.

> Every effort should be made to make English the
> means of communication among the men themselves
> to the complete exclusion of Arabic.

The Rejaf Language Conference (1928) which laid the foundation for the development of the local vernaculars and English in the Southern schools, recommended that Arabic in Roman script also be required in certain communities where the use of no other vernacular is practicable.

5.3 Language Policy in the South. The language policy in the South, during and after independence, was based on the idea that the native children be taught how to read and write in their native languages. After that, they will be gradually introduced to English or Arabic (in third or fourth years of primary school). Much of the educational task was left in the hands of the missionaries who were greatly in favour of the use of the vernacular languages in the first three years of primary school learning.

In 1972, after the Addis Ababa Agreement, the regional government formulated a language policy that was quite comprehensive, at least in my opinion. Accordingly, it was resolved (Yokwe 1977:1; Mahmud 1983:156) that:

> The High Executive Council hereby endorsed the
> use of local languages and of Arabic and English
> for education in the Southern Region. (See Appen-
> dix B)

In my opinion, this is a comprehensive language policy as opposed to the totalitarian language policy of Arabicization. In rural schools, the local vernacular is the language of instruction for the first four years of school; Arabic and English are introduced orally. In urban schools, Arabic is the language of instruction through the sixth year of primary school. [12] with English being introduced orally. (See Appendix B for details) Unlike the Arabicization policy, this language policy reflects and accommodates the realistic and pluralistic multilingual societies of the Sudanese nation. As Cowan (1984:76) clearly stated:

> The language policy eventually adopted by the
> Southern Regional Government represents an in-
> teresting compromise designed to accommodate
> the central government's insistence on main-
> taining Arabic in the educational scheme of
> the Southern Region while insuring a favored
> status to the South's "principal" language---

English, and, at the same time, allowing for
multilingualism.

Above all, the Southern language policy is comprehensive, flexible
and open for, not only "wide discussions" but open for future amendments
to serve practical purposes. One example of practical purpose is the ac-
commodation of Arabic as a medium of instruction in the Southern schools,
particularly in the towns. It was not because the Southerners appreciate
the Arabicization policy from the North, nor is it that Arabic, of late,
is selling hot to the Southerners; it was simply because the Southerners
were faced with a real linguistic problem in the schools whose pupils
come from a diverse linguistic background living in the same town or city.
When a situation like this one arises, the Southerners have no option ex-
cept to turn to Arabic which is also the national language and the lingua
franca in the cities. The truth is that Southerners do not treat verna-
culars or English as substitutes for Arabic. On the contrary, they want
a policy that is comprehensively authentic enough to be called Sudanese
which does not necessarily mean Arabism nor Africanism. The governments
in Khartoum should aim at a policy that reflects our identity as Afro-Arab.

Unlike the Arabicization policy, the Southern language policy is em-
pirically supported by the results of the various recent research regarding
the importance of the use of mother tongue in teaching children how to read
and write in their first three to four years of primary school.

It has been shown (Resnick 1968; Bamgbose 1984; Fishman 1984) that
children are better able to master the basic skills in reading, writing and
arithmetic when these are introduced in the child's own language (or at
least in the language of the community in which he or she resides). Nor
does initial schooling in mother tongue interfere with the child's later
acquisition of another language--which has been one of the major arguments
of proponents of mother tongue instruction. On the contrary, studies have
shown that children who have a firm grounding in their own language are bet-
ter able to master a second language. Numerous studies in various parts
of the world support this claim. For example, Ayo Bamgbose (1984) reports
on projects in Nigeria and Niger. One project (started in 1971) involved
Hausa being used as the medium of instruction for the first three years of
primary school. The results showed that pupils in these schools were more
confident in their abilities; they attained literacy faster in English and
Arabic; they were more fluent in the second language; and they acquired
mathematical and scientific concepts faster than those in the English medium
schools. Another project in Nigeria (1970), involves Yoruba being used as
the medium of instruction for the first six years of primary school (a con-
trol group had Yoruba as the medium of instruction for 3 years). The re-
sults showed that the 6-year group performed better in math and science than
the 3-year group and that their English language skills were equal to or
higher than those of the 3-year group. Similar results were obtained (Bamg-
bose 1984) from such experimental studies in the Republic of Niger where the
mother tongues were used as media of instruction in the first three years of
primary schools. The pupils were more fluent in French than their control
group. In the United States (Fishman 1984), groups of native French-speak-

ing school children in Maine showed excellent results in English when their initial schooling had been in French. Not only does education in mother tongue foster self-confidence, it has also been shown to be more effective in transmitting what Moumouni (1968) called, "The basic knowledge needed by every individual in our times."

Finally, the Southern language policy is more practical and plausible than its counterpart in that it plays a very important political role. It is looked at by the Southerners as an element of socio-cultural and political identification of their African ethnicity as opposed to the assimilation policy of Arabicization. Resnick (1968:17) expresses this feeling vividly when he states:

> Education in the mother tongue is important
> because it is one of the chief means of pre-
> serving whatever is good in native customs,
> ideas and ideals, and thereby preserving
> what is more important than all else: namely,
> native self-respect.

It is this "native self-respect" that the Southerners are trying to preserve through the development and preservation of their vernaculars. Achieving this right leads to a political stability of the country and, therefore, economic prosperity. The Addis Ababa Agreement (1972) has shown that for the good of the Sudanese nation peace is better than war; tolerance is better than repression, and the policy of reconciliation is far better than the policy of totalitarianism. Absolute Arabicization is a direct contradiction to the Sudanese aspirations as a nation.

The Southern language policy was formulated by people who were fully aware of the importance of the role of the Arabic language as an instrument of national integration. That is why its status stands high in the Southern language policy; not because the Southerners are submitting to the total package of Arabicization as some people would like to see. At the same time, English is maintained in the system because of its important role as a link between the Sudanese and the rest of the African countries and the world at large. This is a role that is acceptable even to the Khartoum government which has allowed English to be taught as a subject in the schools.

6.0 CONCLUSIONS

I have tried to develop the picture that the general campaign by the OAU member states for the promotion of the indigenous African languages to be adopted as media of instruction in schools should not be abused as the case in the Sudan shows; that the Khartoum Government in the Sudan is deviating from the OAU concept of indigenization of the language policies. The Government has been leaning toward the adoption of a totalitarian language policy based on the great policy of Arabicization which simply means socio-cultural and linguistic assimilation of the indigenous African groups. This policy has failed in the South since it seeks to replace the highly valued vernacular languages. In the North, Beja, Nubian, Fur, Masalit, etc., still constitute

50%, 19%, 21%, 12.5% of the population, respectively. But unlike the situation in the South, none of these languages are used in teaching children in primary schools. Instead, Arabic is used indiscriminately on the assumption that the Northern societies have adopted Arabic as their mother tongue. Such a picture is false and should not be encouraged.

All that the African countries need is a gradual evolution of national languages without a dramatic imposition or denunciation of the vernaculars of the minorities which still serve as means of communication in rural areas where the majority of our children go to school. These children should be given the chance to learn how to read and write in their mother tongues.

NOTES

[1] Parliamentary Proceedings: Second Sitting of the First Session of Parliament, 1958, p. 3. Quoted from Alibino, p.6. (O. Alibino, The Sudan: A Southern Viewpoint, London, 1970).

[2] These people are referred to as Negroids or Southerners as opposed to the Northerners.

[3] Sudan African Closed Districts National Union (1963), Petition to the United Nations.

[4] (i) Beshir, M.O. (1968). "The Southern Sudan. Background to Conflict." 1930 Memorandum of Southern Policy (Appendix I:115). (ii) However, this policy was later on reversed in 1946, allowing for the unity between the South and the North.

[5] Jaden, Agrey. Khartoum Conference on Southern Sudan (March, 1965). Sudan Government, Khartoum.

[6] Muddathir, Abd al-Rahim (1968). "Arabism, Africanism and Self-Identification in the Sudan." Sudan in Africa, edited by Yusuf Fadl. Khartoum.

[7] See proceedings of the Sudan Constituent Assembly, October, 1966. Quoted from Wai, p.24. (D.M. Wai, ed., The Southern Sudan and the Problem of National Integration, 1973.

[8] 'Education in the Sudan', Eleventh Annual Conference of the Philosophical Society of the Sudan (1963), p. 3, in a paper by S.V. Rao, "Adult Education in the Sudan."

[9] The Secretary, who presumably drafted the Report, was a Sudanese official of the Ministry of Education, Dr. Ahmad al-Tayyid.

[10]The Addis Ababa Agreement on the Problem of South Sudan. Draft organic law to organize regional self-government in the Southern provinces of the Democratic Republic of the Sudan, 1972. Quoted from Wai, ibid, Appendix VII.

[11]'Report of the Commission of Inquiry into the Disturbances in the Southern Sudan during August 1955' (Khartoum 1956:87).

[12]Pre-university education period in the Sudan is split into two stages of six years: primary and secondary (6 = 3 + 3).   Secondary stage is subdivided into: general and academic, with three years each.   Primary education is six years.

APPENDIX A: POLITICAL MAP OF THE SUDAN WITH PROVINCIAL TOWNS

APPENDIX B

The Language Policy of the Southern Sudan. The High Executive Council's Resolution No. 273, November 1975. Southern Sudan.

A. In the case of rural schools:

    1. The vernacular be used as medium of instruction in the first and second years with Arabic and English introduced orally;

    2. The vernacular be used as medium of instruction in the third and fourth years while Arabic and English are intensified;

    3. Arabic be the medium of instruction in fifth and sixth years while English continues to be intensified.

B. In the case of urban areas:

    1. Arabic be the medium of instruction in the first and second years while English is introduced orally;

    2. Arabic continues as medium of instruction in third and fourth years while English is introduced in writing;

    3. In fifth and sixth years Arabic continues as medium of instruction while English is intensified.

C. In all junior secondary schools Arabic shall be the medium of instruction while English is intensified.

D. In all senior secondary and post senior secondary institutions, English shall be the medium of instruction and Arabic is taught as a language with its literature.

E. Adult education shall be conducted in local languages and in Arabic.

F. The Regional Ministry of Education shall establish an institute for regional languages with a department for local languages and shall seek the assistance of the Summer Institute of Linguistics in the development of the Southern local languages.

G. Specialization in local languages at senior secondary and higher institutional levels on optional bases be encouraged.

H. The Regional Government supports the establishment of the Regional Curriculum Development Center.

I. The decision will be implemented gradually taking into account the present pattern of education which allows for both English and Arabic as a medium of instruction; and

J. The language problem be open for wide discussions.

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TABLE OF CONTENTS

CV-SKELETON OR X-SKELETON: THE TURKISH EVIDENCE

Diana Archangeli

        In recent work on syllable structure and the core
skeleton, Levin (1983, 1984) argues that the core skeleton is
defined in terms of unlabeled positions or slots ("X"s) and
not in terms of slots labeled "C" or "V". Here we address
one of the most compelling arguments for the C and V labels,
Clements and Keyser's (1983) discussion of Turkish "empty
consonants". Adopting proposals found in Levin's work, I
argue that regularities found in the Turkish data are readily
expressed without recourse to labeling skeletal slots, and
with rules no more complex than those required with the C and
V labels. This demonstration, along with Levin's work on
Klamath, leads to the conclusion that the set of phonological
primitives need not include the C and V labels for skeletal
slots.

        In developing a three-dimensional model of syllable structure,
Clements and Keyser (1983) (henceforth C&K) argue that certain nominal
paradigms in Turkish provide evidence for labeling the core skeleton
with Cs and Vs. I demonstrate here that the Turkish data can be
accounted for without reference to the slot labels C, V (yet the
essence of C&K's analysis is kept intact). This extends work by Levin
(1983, 1984) in arguing against a labeled core skeleton.[1] First the
data and the CV-less analysis are presented. The theory used here and
that advanced in C&K are then compared. Through this comparison we see
that by limiting core syllabification to the construction of onsets
(i.e. of "CV" syllables but not "CVC" syllables), we are able to
dispense with the C, V labels. This same move is argued for
independently in Steriade (1982) and Levin (1983, 1984).

        The paradigm of interest is presented in (1) below (reproduced
from C&K: 67). In (1a) the nouns are vowel-final, and in (1b) they are
consonant-final, as seen in the nominative cases. The dative and
possessive affixes vary, depending on the final segment in the noun:
the vowel-initial affix -InIz loses its initial vowel when concatenated
with vowel-final nouns (1a) and the consonant-initial affixes -yE and

<u>-sI</u> lose the initial consonant after consonant-final nouns (1b).
Straightforward segmental deletion rules account for the allomorphy.[2]

(1)

		nom.	nom.pl.	dat.	3sg.poss.	2pl.poss.
a.	room	oda	odalar	odaya	odasɨ	odanɨz
	river	dere	dereler	dereye	deresi	dereniz
	bee	arɨ	arɨlar	arɨya	arɨsɨ	arɨnɨz
b.	cap	kep	kepler	kepe	kepi	kepiniz
	stalk	sap	saplar	sapa	sapɨ	sapɨnɨz
	Ahmed	ahmet	ahmetler	ahmede	ahmedi	ahmediniz

With nouns ending in long vowels, we find a contrast. Some (2a)
pattern like the (short-)vowel-final nouns in (1a) and others (2b)
pattern with the consonant-final nouns of (1b) (reproduced from C&K:
69, 68 respectively):

(2)

a.	la	la:	la:lar	la:ya	la:sɨ	la:nɨz
	(musical note)					
	spelling	imla:	imla:lar	imla:ya	imla:sɨ	imla:nɨz
	building	bina:	bina:lar	bina:ya	bina:sɨ	bina:nɨz
b.	mountain	da:	da:lar	daa	daɨ	daɨnɨz
	avalanche	cɨ:	cɨ:lar	cɨa	cɨɨ	cɨɨnɨz
	dew	ci:	ci:ler	cie	cii	ciiniz

The contrast between (2a), (2b) may be attributed to different
underlying representations. C&K propose the following (C&K: 70):

(3)
a.

b.
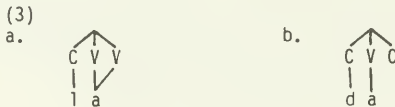
The label of the final slot (C or V) determines which allomorphy rule
applies. (C&K never make these rules explicit. In the discussion of
(9) and (10), I will attempt formalization of the rules C&K assume.)

Let us remove the C, V labels and replace them by syllable
structure sufficient to differentiate the two representations above,
following Levin. The "VV" of (3a) is represented as a two-part nucleus

and the "VC" of (3b) as a nucleus followed by an unsyllabified slot:[3]

(4)
a.   ⋀   b. |
   X X X   X X X

   l a   d a
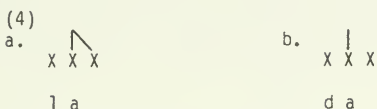
Associations between segments and skeleta include a rule of
Syllable-Internal Spread (SIS, 5 below) as well as the Universal
Association Convention (UAC). I follow Pulleyblank (1983) in assuming
that multiple linkings are not an automatic consequence of the UAC.
Consequently, a rule, SIS, is needed to spread the vowel matrix to the
second nuclear position.

(5) Syllable Internal Spread (SIS)

                              ⋀
                           X (X)
                            ⌐´
                           [F]

     Automatic Core Syllabification creates onsets on all syllables, if
possible:

(6) Core Syllabification (CS)

                           σ
                          ´´|
                        X´ X

CS (6) is part of Universal Grammar, of the same theoretical status as
the UAC. This captures the observation that all languages have
syllables with onsets, although not every language has syllables with
codas and onsetless syllables do exist. Also, like the UAC, it applies
whenever possible, thus accounting for resyllabification into onsets.

     The forms from (4) are given a CV-less representation in (7), and
corresponding short vowel-final and consonant-final nouns are
represented in (8). In (7), (8) the UAC, SIS (5), and CS (6) have
taken effect. Results of the UAC and CS are given by solid lines;
results of SIS (5) are represented by the dashed line.

(7)
a.

b.
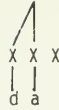
(8)
a.

b.
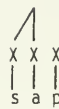
Examination of the representations in (7) and (8) reveals that the environments of the allomorphy rules are expressible in terms of syllable structure. The morpheme-initial segment deletes after a syllabified slot with the affix -InIz:

(9)
X ⟶ 0 / X] ___ where X is a syllabified slot
|
[F]

and it deletes after an unsyllabified slot with the affixes -yE and -sI:

(10)
X ⟶ 0 / X'] ___ where X' is an unsyllabified slot
|
[F]

Once these allomörphic deletions take place, syllabification proceeds according to the following rule:

(11) Coda Rule:

X X'

(Rules/conventions similar to CS (6) and CR (11) are found in C&K, Harris (1983), Steriade (1982), to name a few.) As noted above, I follow Steriade (1982), Levin (1983, 1984) in ascribing a universal status to CS (6) and a language-particular status to CR (11).

The following derivations produce results that are essentially identical to those in C&K, except for the lack of CV labels on the core skeleton. In the first step, the UAC provides for one-to-one, left-to-right association of the melody to the skeletal slots and CS (6) builds onsets. These are both shown by dashed lines in the first step of (12).

(12)
UR (4), UAC, SIS (5), CS (6)
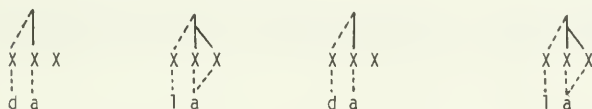
Affixation (and CS 6)
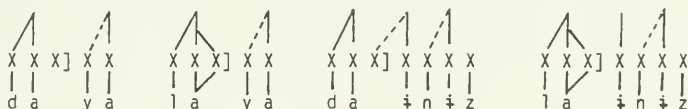
Affixes are added and again CS (6) builds onsets wherever possible (shown with dashed lines). In the case of the vowel-initial affix -InIz, an onset is formed from the unsyllabified final X of the root daX. In the third step, the rules of allomorphic deletion (9) and (10) remove the affix-initial slot in daX+yA and laX+InIz. CS (6) applies wherever it can.

(12) cont.
allomorphic deletion (and CS 6)

CR (11)

n/a   n/a

```
    /|  /|  /|.          /|.  /|.
  X X X] X X X X       X X X] X X X
  | |    | | | |       | |/   | | |
  d a    ɨ n ɨ z       l a    n ɨ z
```
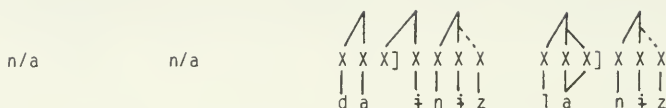
CR (11) now incorporates the final consonant of -InIz into the
preceding syllable, and the surface representations of all four forms
are derived.

(12) cont.
surface representation

```
  /| /|         /|\ /|        /| /| /|\        /|\ /|\
 X X X X      X X X X X     X X X X X X X     X X X X X X
 | |   |      | |/ | |      | |   | | | |     | |/  | | |
 d a   a      l a y a       d a   ɨ n ɨ z     l a   n ɨ z
```

With daa, daɨnɨz, a slot is syllabified as an onset even though it has
no features associated with it. This slot, therefore, is not
pronounced. Below, we see derivations where the empty slot is
syllabified in the first syllable, not the second:

(13)
UR (4) and affixation, UAC, CS (6), SIS (5)

```
  /|                    |   /|
 X X X               X X X] X X X
 | |                 | |    | | |
 d a                 d a    l a r
```

CR (11)

```
  /|\                   /|\ /|\
 X X X                X X X] X X X
 | |                  | |    | | |
 d a                  d a    l a r
```
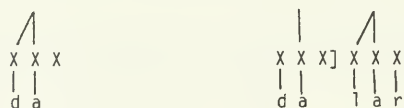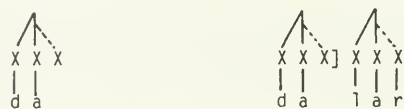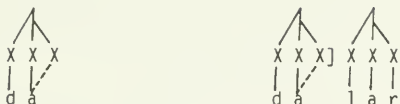
SIS (5)

The long vowel is derived via CR (11) and SIS (5). Thus, we may conclude that the CV-less theory accounts for the Turkish data. Let us now compare the CV-theory of C&K with the CV-less theory, to see how they differ, beyond the use of labels on the core skeleton.

Both theories include syllable structure in underlying representation. As we have seen, underlying representations are formed in terms of X's with or without syllable structure in the CV-less theory. In C&K, syllable structure is supplied to lexical representations in accordance with a construction algorithm which states "V-elements are prelinked to σ's" (C&K: 38). Thus, underlying representations consist of strings of C, V which automatically become strings of

$$\begin{array}{c} σ \\ | \\ C, V \end{array}$$

Since any V in underlying representation is linked to a syllable by this algorithm, anywhere an underlying V is found, we have, in essence, underlying syllable structure. (The V label is still essential in C&K as there is no internal syllable structure available to distinguish heads from non-heads without the labels.)[4]

The theories require the same operations. Both models include rules of syllabification which create onsets and codas, and include rules of resyllabification, syllable-internal spread, and allomorphy for Turkish.

The Turkish allomorphy rules are essentially equivalent. Although the rules are not made explicit in C&K, we may assume something like the following corresponding to our (9) and (10):

(14)
a. $V \longrightarrow 0 / V$ ___   b. $C \longrightarrow 0 / C$ ___
   | |
  [F]   [F]   .

both in the appropriate morphological environments

It is not immediately obvious that these rules are any more complex or any more simple than the rules in (9) and (10) -- on this score also, the two accounts are basically the same.

The point of difference is in the definition of core syllabification. In the CV-less theory, core syllabification forms "CV" syllables only. Syllables are closed by language particular coda rules. In the CV-theory, core syllabification includes coda formation. However, this rule is in no direct way related to the labels C, V. It simply characterizes a syllabification process. With respect to the Turkish data, we may order the coda rule with core syllabification or in the phonology. However, if the coda rule is part of core syllabification, the labels C, V are needed to determine which allomorphy rule is applicable. If it is not obligatorily part of core syllabification, then the labels C, V are unnecessary, and allomorphy is determined by the syllabification status of the noun-final slot.

There are certain theoretical consequences obtained by eliminating the labels C, V. Most importantly, we decrease the number of primitives in the set of phonological symbols. Having fewer elements to manipulate results in fewer permutations of those elements and consequently severely restricts the set of possible grammars. On the other hand, the coda rule is a manipulation of the phonological primitives. Altering its role in Universal Grammar has ramifications, as seen here, but does not lead clearly to a reduction or an increase in the number of possible grammars.

In the model proposed here, core syllabification comprises only what is truly universal, the creation of "CV" syllables (by CS (6)). This, along with the Universal Association Convention, is assumed to apply whenever possible, from whence we derive resyllabification into onsets. The coda rule (11) is language particular, as not all languages have coda rules, and is not part of core syllabification.

Finally, the redundancy in underlying representations of prelinking all V slots to syllables does not exist. Certain slots are designated as part of a syllable, others are not. Those which are not syllabified in underlying representation may be incorporated in a syllable by core syllabification or by other syllabification rules.

FOOTNOTES

[1]C&K advance three arguments for C, V labels, from Turkish, Finnish, and Klamath. Levin (1984) deals with the Klamath evidence. The Finnish example succombs to a straightforward transliteration into a CV-less representation. This article is concerned only with the Turkish example.

[2]The capital letters refer to the high ($\underline{I}$) and mid ($\underline{A}$) vowels which undergo harmony.

[3]C&K propose a syllable plane and a nucleus plane, the latter formally distinct from but dependent on the former. Each has a flat structure, that is has no internal hierarchy, (a) below. The structure employed here, (b) below, has one degree of hierarchy, and no labels on the nodes (the structure is sufficient to determine relative positions within the syllable).

a.   b.

   X X X (X)   X X X (X)
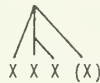
In (b), the vertical line (|) denotes the head of the syllable and the angled lines (/ and \) denote periphery elements. The lower node corresponds to C&K's nuclei. The difference is that in (b), both syllable and nucleus have heads while in (a), we may say that the nucleus is the head of the syllable, but the nucleus itself has no head. Analyses such as Harris's (1983) treatment of Spanish diphthongs suggest that the head/non-head positions in the nucleus need to be distinguished. I am grateful to Jean d'Souza for helpful discussion of this point.

[4]Nothing is said about VV sequences in C&K, whether they are in a single syllable or in separate syllables.

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SCHWA SYNCOPE AND VOWEL NASALIZATION IN HINDI-URDU: A NON-LINEAR APPROACH[1]

Jean D'souza

Schwa syncope in Hindi-Urdu has been of interest to phono-
logists for some time and several linear analyses have been
proposed to account for it. The phenomenon is made more
interesting because of its interaction with vowel nasalization
which suggests that the nasal vowels in Hindi-Urdu should be
treated as a sequence of long vowel and nasal consonant
rather than as an underlying nasal vowel. Provided such an
analysis is possible, a considerable economy in the phonemic
inventory of the language can be effected. In the linear analyses
of schwa syncope, what started out as a simple rule: ə -→ ∅/VC
(Pray 1970), became more and more complex in order to deal with
all the data. Recent developments in non-linear phonology have
made possible a simpler and more insightful account of the Hindi-
Urdu facts. Chief among these are: 1) the development of the
core skeleton as a series of unlabelled slots rather than a series
of CV elements. 2) the use of the foot as a domain for segmental
processes. In the present analysis, syllable structure and
syncope feet make possible an account which is more elegant and
more illuminating than any linear account.

1.0 Introduction.
     Schwa syncope is a very productive rule in Hindi-Urdu[2] and has been
the subject of considerable interest for a long time. Several different
accounts of schwa deletion have been proposed, e.g., Pray (1970),
Narang and Becker (1971), Ohala (1972), among others. All these analyses
have dealt with schwa syncope in linear terms. This paper presents a non-
linear analysis of schwa deletion and shows that a non-linear analysis
in terms of syllable and foot structure provides a simple and insightful
account of the phenomenon of schwa deletion. Some of the other accounts
proposed for schwa syncope are examined and it is shown that a syllable
based analysis does not encounter any of the difficulties the linear analyses
run into. More importantly, facts which have to be accounted for by
stipulations in a linear analysis or demand the use of global powers
are shown to fall out very naturally from syllable structure.

     Finally, vowel nasalization, a much debated issue in Hindi-Urdu
phonology, is looked at and it is suggested that a non-linear analysis
not only sheds light on the interaction between schwa deletion and
vowel nasalization, it also makes possible an account that effects a
considerable economy in the phonemic inventory of the language.

1.1 The Facts.
     Schwa deletion is a very general rule in Hindi-Urdu. It deletes
the final schwa of a verb stem if that stem is followed by a vowel
initial suffix. For example:

(1.) verb stem   past[3]   gloss
      nikəl   nikla: 'come out'
      pəkər   pəkra: 'catch'
      pičək   pička: 'squeeze'

The rule also applies to noun stems. For example:

(2.) nom. sing   oblique pl.   gloss
      kəmər   kəmrõ: 'waist'
      səbək   səbkõ: 'lesson'
      ke:sər   ke:srõ: 'saffron'

Evidence for this being a rule of deletion (vs. insertion) comes from
forms in the nominative singular which end in consonant clusters. For
example in the forms given below no schwa intervenes between the under-
lined clusters.

(3.) qət̲l̲   qətlõ: 'murder'
      swə̲r̲g̲   swərgõ: 'heaven'
      kə̲š̲t̲   kəštõ: 'trouble'

     Syncope does not apply if the schwa is preceded by a consonant
cluster:

(4.) pustək   pustəkõ: 'book'
      ki:rtən   ki:rtənõ: 'song'
      akṣər   əkṣərõ: 'letter'

In addition it does not apply if the schwa is followed by a consonant
cluster:

(5.) pələŋg   pələŋgõ: 'bed'
      tiləsm   tiləsmõ: 'magic'
      dərəxt   dərəxtõ: 'tree'

1.2 Previous Analyses.
     These facts led Pray (1970) to formulate the schwa deletion rule
as follows:[4]

     (6.) ə --> Ø/VC___CV

     Narang and Becker (1971) elaborated this rule a bit in order to
stop schwa deletion from applying word internally. They did this to
account for the word [wa:ra:nəsi:] the old form of the name Benaras.
Their rule is:[5]

(7.) $\begin{bmatrix} +\text{syllabic} \\ +\text{compact} \\ -\text{tense} \end{bmatrix}$ --> Ø/VC___C + V

     This inclusion of the morpheme boundary to the right is not a
crucial addition as [wa:ra:nəsi:] seems to be the only word that demands
it and hence can be treated as an exception. In addition, as pointed
out by Ohala (1972) schwa syncope does optionally apply morpheme

internally in some cases and the presence of the morpheme boundary
renders Narang and Becker's rule incapable of accounting for alterna-
tions like the following:

(8.) rəǰəni: ~ rəǰni: 'night'
     ka:dəmbəri ~ ka:dəmbri: 'a novel'

To account for these alternations and also for the fact that schwa
deletion optionally applies in the speech of some native speakers in
spite of a preceding consonant cluster, Ohala (1972) elaborates the rule
still further. She also takes into consideration the sociolinguistic
contexts in which the rule applies. Her rule is formulated as follows:

(9.) ə --→   ∅/VC²₁___CV/ $\left\{ \begin{matrix} \left[\begin{matrix} +\text{loan} \\ +\text{casual speech} \end{matrix} \right] \\ \left[+\text{normal tempo} \right] \end{matrix} \right\}$

       Condition 1: There may be no + in the environment to the left.
       Condition 2: The output of the rule will not violate the sequential
                     constraints of Hindi.
       Condition 3: The rule applies from right to left.

Ohala cites forms like ǰəŋgəli: ǰəŋgli: 'wild' and do:ŋgəri:
do:ŋgri: 'pertaining to hill people' to show that schwa deletion does
not apply for some speakers in spite of a preceding consonant cluster.
She invokes Condition 1 in order to account for: a) the non-application
of the rule in stems to which prefixes have been added, for example:

(10.) be + pərʰ + a: ---→ bepərʰa: 'unread'   *beprʰa:
      ə + səməy   ---→ əsəməy   'inopportune;   *əsməy
      a + mər +ən   ---→ amərən   'until death'   *amrən

b) its non-application in suffixes containing schwa:

(11.) kəla: + wət + i: ---→ kəla:wəti: 'name for a girl'
                              *kəla:wti:
      ka:ri: + gər + i: ---→ ka:ri:gəri: 'craftsmanship'
                              *ka:ri:gri:
      eka:ki: + pən + a: ---→ eka:ki:pəna: 'lonesomeness;
                              *ekaki:pna:

Condition 2 is needed in order to account for exceptions to her rule,
i.e., cases in which a schwa does not delete when preceded by a consonant
cluster even though the rule would predict deletion. (Ohala provides
a list of the sequential constraints that mediate against schwa deletion.)

(12.) kudrət   'nature'   kudrəti: 'natural'   *kudrti:
      kərwət   'side'   kərwət̃ẽ   'sides'   *kərwt̃ẽ
      čitwən   'glance'   čitwənẽ   'glances'   *čitwnẽ

Condition 3 is the most tentative and Ohala cites as evidence the way
in which native speakers render unfamiliar words written in Devanagari

(the Hindi script). For example, the word for 'adopted' is [godnəši:n]
in Hindi-Urdu. However its written form in Devanagari is "godənəši:n".
Speakers unfamiliar with the word pronounce it with the second schwa
deleted, i.e. [godənši:n]. This according to Ohala suggests that the rule
of schwa deletion may be applying from right to left.

Ohala's rule is rather complex and depends on several seemingly
arbitrary conditions without providing a satisfactory explanation as to why
these conditions are necessary. This however is not so much a criticism
of Ohala's analysis as it is a criticism of the theory upon which the
analysis is based. Linear phonology just does not provide the means
necessary for a simpler and more satisfying account of the processes
described above.

2.0 A Non-Linear Approach.
I show here that a non-linear analysis in terms of syllable structure
provides a straightforward account of the schwa deletion facts, eliminates
the need for conditions, simplifies the rule and at the same time sheds
light on the reasons for the application of the rule. In my analysis I
assume the theory of autosegmental phonology first proposed by Goldsmith
(1976) to account for tonal phenomena and later extended by McCarthy
(1981) to the analysis of the non-concatenative morphology of the
Semitic languages.

2.1 The Background.
Following McCarthy (1981), I assume a core skeleton and a melody
tier in underlying representation. However, adopting proposals made
by Levin (1984) and Archangeli (1984), I make use of a core skeleton
consisting of unlabelled X slots rather than the CV slots McCarthy
proposed. (An X skeleton has certain advantages over a CV skeleton.
Some of these advantages will become obvious from this analysis, for
others see Levin (1984) and Archangeli (1984).)

In the underlying representation (UR) of a lexical item one finds
a series of unlinked melodies and an X skeleton. The melodies are
linked to the skeleton slots by the Universal Association Convention
i.e. one to one, left to right. Linking obeys the Well-Formedness
Condition which rules out crossed association lines.

2.2 Syllable Structure.
Syllable structure is largely rule governed. In UR syllable heads
are denoted by a vertical line linked to an X slot. All other elements
are unlinked. In Hindi-Urdu only vowels may link to a slot identified
as a syllable head. Vowels are marked with the feature +N, consonants
with the feature -N (Levin 1984). For example:

(13.) |
                     X   X
                     | |
                  [ ]₊ₙ   [ ]₋ₙ
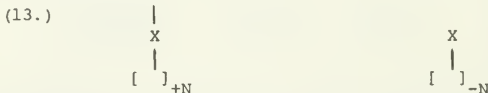
Syllable heads in Hindi-Urdu may have either of the following structures:

(14. A.) | (B.) /\
        X   XX
        | \'
     [   ]$_{+N}$ [   ]$_{+N}$

(14.A.) denotes a short vowel head, (14.B.) denotes a long vowel, the
first element of which is the head. A rule (which probably is universal)
spreads [   ]$_{+N}$ in the configuration in (14.B.). Solid lines indicate
elements pre-specified in UR. All other constituents of the syllable are
incorporated by rule and are represented by broken lines e.g.,

(15. A.)   (B.)
       XXX   XXXX
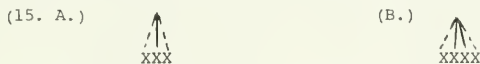
I am suggesting a differentiation between solid lines and broken lines
as more than a notational convenience. As the data in section 3 show,
the distinction it makes possible between elements pre-specified in
UR and those incorporated into the syllable by rule is crucial.

     Core syllabification is obtained by the application of universal
rules:

     (16.) i)   The onset rule which incorporates a single unsyllabified
               slot from the left e.g.,

                      |
                XX ---→ XX
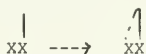
        ii)   The coda rule which incorporates a single unsyllabified slot
               from the right e.g.,

                      |
                XX --→ XX

The onset rule applies first accounting for the universally preferred
CV syllable structure. Thus, given the structure in (17.A.) application
of the 'onset first' principle (Clements and Keyser 1983)[6] results in
(17.B.) rather than (17.C.). (I follow Steriade (1982) in modifying
the principle as formulated by Clements and Keyser so that Universal
Grammar allows for the incorporation of only one C by the onset first
principle. All other C's are incorporated by language specific rules.
The onset rule is followed by the code rule which also incorporates only
one C.)

(17.) A.   B.   C.   *
       | | |
      XXXX   XXXX   XXXX

2.3 Foot Construction.
     The concept of the foot in linguistic description, long neglected,
has of late come into its own. Several recent studies make use of the

foot in segmental rules, among them being Withgott (1982), Rappaport (1984),
Archangeli (1984), and Hammond (1985).

I suggest that in Hindi-Urdu syllabification is followed by foot
construction. The language has syncope feet which play an important part
in certain segmental processes. These feet are constructed as follows:

(18.) <u>foot rule</u>   Build left dominant quantity sensitive binary
                feet beginning at the left edge of the word.

Being quantity sensitive the rule allows feet to have weak branches
only in case the syllable on which the weak branch is constructed has
a light or non-branching rime. For example,

(19.)

'bedding'   but   'wife'
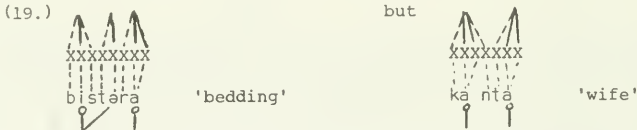
A weak branch of a foot can be constructed on the second syllable of
the word <u>bistəra:</u> because this syllable has a non-branching rime. The
same is not possible for the word <u>ka:nta:</u> because the second syllable
has a branching rime.

2.4 Schwa Syncope.
     The groundwork being laid, the process that leads to schwa syncope
can be formulated as follows:

(20.) <u>schwa desyllabification</u>
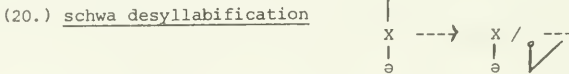
The rule says that if a schwa is located on the weak branch of a
foot the association line marking it as a syllable head is severed.
I adopt the general convention that any element not in a syllable at
surface structure is not phonetically realized. Therefore, unless the
desyllabified schwa is reinstated as a syllable it does not show up on
the surface.

Schwa desyllabification accounts for schwa deletion in words like
<u>səbək + ŏ:</u>, <u>nikəl + a:</u>, <u>ke:sər + ŏ:</u>, given in (1) and (2) above.
For example:

(21.)

by schwa desyllabification (20)
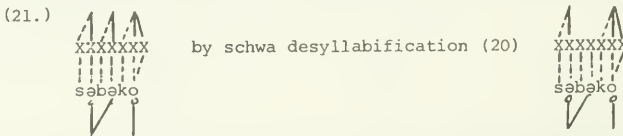
Core syllabification (16) immediately follows desyllabification and
the stranded consonant is linked to a syllable:[7]

(22.)

```
      ↑   ↑
    XXXXXXX
    ׀ ׀ ׀ ׀ ׀ ׀׀
    ׀ ׀ ׀ ׀ ׀ ׀׀
    səbəko
PR  səbkõ:
```
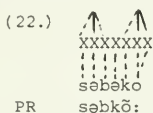
It also accounts for the non-deletion of schwa in words like tiləsmõ:,
pələŋgõ:, etc. (5) in which the schwa is followed by a consonant cluster
e.g.,

(23.)

```
   ∧ ∧  ∧                          ∧ ∧  ∧
  XXXXXXXX                        XXXXXXXX
  ׀׀׀׀׀׀׀׀                        ׀׀׀׀׀׀׀׀
  ׀׀׀׀׀׀׀׀                        ׀׀׀׀׀׀׀׀
  tiləsmo                         pələŋgo
   ׀  ׀  ׀                          ׀  ׀  ׀
```
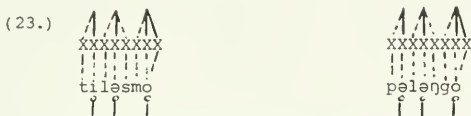
Since feet are quantity sensitive the second syllable in these
words cannot be on a weak branch. These structures therefore do not
present the right environment for the application of schwa desyllabi-
fication, the schwa remains linked to the syllable and is realized
on the surface.

Evidence for foot construction having to be quantity sensitive comes
from words like those in (23) for which the wrong results are obtained
if feet are not quantity sensitive:

(24.) A.

```
    ∧ ∧  ∧                   B.    ∧ ∧  ∧
  XXXXXXXX                        XXXXXXXX
  ׀׀׀׀׀׀׀׀                        ׀׀׀׀׀׀׀׀
  tiləsmo                         tiləsmo
   ׀  ׀  ׀                          V  ׀
```

PR   tiləsmõ: *tilsmõ:

In (24.A.) quantity senstive feet have been constructed and as the
schwa is not in the scope of a weak foot it cannot be desyllabified
and the right result is obtained. The feet in (24.B.) however are
quantity insensitive and as the schwa is on a weak branch, rule (20)
can apply giving the wrong results.

2.5 Dialectal Variation.
     Words like pustəko: (4) lead us to consider the fact (mentioned
earlier) that though for many speakers schwa does not delete when
preceded by a consonant cluster, for an increasing number of speakers
schwa deletion is beginning to apply even in the environment of a
preceding cluster. Let us call the first case Dialect A and the second
Dialect B. We will first consider Dialect A and the non-deletion
of schwa in words like pustək + õ:, ki:rtən + õ:, etc. (4).

(25.)
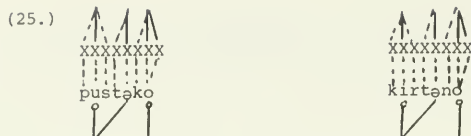
These forms provide the environment for schwa desyllabification. It applies giving:

(26.)
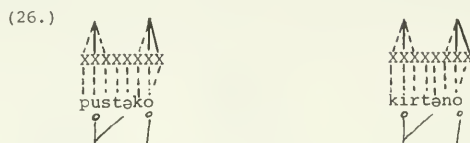
Now the core syllabification rules apply. First the onset rule tries to incorporate the stranded consonant into the syllable following it. This syllable however already has an onset so nothing happens. The coda rule also fails since the preceding syllable already has a coda. I suggest that at this point another rule applies reinstating the schwa as a syllable head. This rule can be formulated as follows:

(27.) schwa reinstatement

$$X \longrightarrow X \ / \ X' \ \underline{\quad\quad}$$
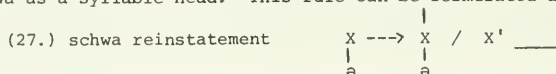
(X' denotes an unsyllabified slot)

Application of schwa reinstatement to the forms above gives:

(28.)
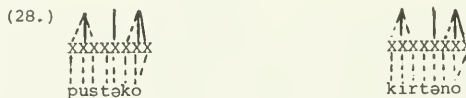
Core syllabification now applies giving:

(29.)
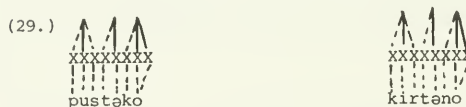
PR   pustəkõ: kirtənõ:

Dialect A therefore can be accounted for very easily. How are we to account for Dialect B in which schwa deletes in spite of a preceding cluster, e.g., jəŋgli:, cʰucʰundri: 'a kind of rat'? These cases can be looked at in terms of a reordering of rules. In Hindi-Urdu

in addition to the core syllabification rules there are rules of extended
syllabification which take additional consonants into the onset or the
coda. These rules can be formulated as follows:

(30.) <u>rules of extended syllabification</u>

a) X'XX(X) ---→ XXX(X)

b) X(X)XX' ---→ X(X)XX
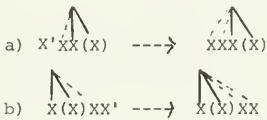
These rules are necessary to account for words like:

(31.)

kwa ra   'bachelor'   lutf   'pleasure'
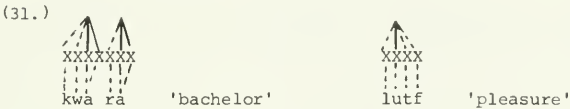
in which the onset in one case and the coda in the other contain more
than one element. In Dialect A rules of extended syllabification
apply after the application of schwa reinstatement; in Dialect B
however a reordering of these rules has taken place and extended
syllabification rules apply before schwa reinstatement. The difference
between the two dialects therefore can be shown as follows:

(32.)

DIALECT A	DIALECT B
1. core syllabification	core syllabification
2. foot construction	foot construction
3. schwa desyllabification	schwa desyllabification
4. core syllabification	core syllabification
⌐5. schwa reinstatement	⌐extended syllabification
⎸6. core syllabification	⌊schwa reinstatement
⌊7. extended syllabification	core syllabification

It may be noted that core syllabification follows every rule that
alters syllable structure. Therefore foot construction which does not
change syllable structure, and extended syllabification which leaves
nothing new for core syllabification to do, are not followed by core
syllabification.

The derivation of a word from Dialect A has already been given
above. Let us now look at the derivation of a word from Dialect B.

(33.) by core syllabification (16)

and foot construction (18):   jəngəli

schwa desyllabification (20)·

jəngəli

core syllabification (16):   --------

```
extended syllabification (30):    XXXXXXXXX
                                  ǰǝŋgǝli
schwa reinstatement (27):         --------
core syllabification (16):        --------
PR                                ǰǝŋgli:
```

Thus the same rules, with only a simple reordering, can account for both dialects of Hindi-Urdu. A small complication nonetheless does arise in the case of speakers of Dialect B who, though they delete schwa after preceding clusters do not do so in the case of all clusters e.g.,

(34.) mǝtlǝbi: 'selfish'   *mǝtlbi:
       ǝdrǝkŏ: 'ginger'   *ǝdrkŏ:
       kudrǝti: 'natural'   *kudrti:

This, as mentioned earlier, is what led Ohala (1972) to impose Condition 2 on her schwa deletion rule.

Under the present analysis such forms are not too difficult to account for. As we have seen schwa desyllabification in Dialect B is followed by core syllabification and then by extended syllabification. Core syllabification cannot apply if the preceding coda and following onset positions have already been filled. In addition, in cases like the above, extended syllabification cannot apply either for reasons particular to Hindi-Urdu. Restrictions on permissable onset and coda clusters are extremely stringent in this language and not all consonants left stranded by desyllabification can be incorporated into a syllable (for allowed onsets and codas see D'souza 1983). In such cases schwa reinstatement which follows extended syllabification reinstates the schwa as the head of the syllable. Such examples provide independent support for schwa reinstatement.

```
(35.) syllabification (16) and     XXXXXXXX
                                   mǝtlǝbi
      foot construction (18):

      schwa desyllabification (20): XXXXXXXX
                                    mǝtlǝbi

      core syllabification (16):    --------
      extended syllabification (30); --------

      schwa reinstatement (27):     XXXXXXXX
                                    mǝtlǝbi

      core syllabification (16):    XXXXXXXX
                                    mǝtlǝbi

      PR                            mǝtlǝbi:
```

Thus what a linear approach has to formulate as a condition on a
rule is a natural result of syllabification.

2.6 Initial Accenting.
We have seen so far that looking at schwa deletion in terms of
syllable and foot structure accounts for most of the Hindi-Urdu data.
Let us now briefly examine the non-application of schwa syncope across a
morpheme boundary to the left (Ohala's Condition 1). As noted by Ohala,
schwa syncope does not apply in cases like the following:

(36.) be + pəɽ^h + a: 'unread'
    kəla: + wəti: 'name for a girl'
    a + mər + ən̩   'until death'

These forms can be accounted for if we assume that all morpheme
initial syllables are accented i.e., they are heads of feet.

(37.) <u>initial accent</u>   Every morpheme initial syllable is
    the head of a foot.

This assumption enables us to account for all the data in a fairly
straightforward manner. The fact that initial morphemes are accented
is not peculiar to Hindi-Urdu as several other languages employ the
same strategy. (For an account of initial accenting in Tunica see
Hammond 1984). Given the forms above, initial accenting results in
the following feet being built:

(38.) be + pəɽ^h + a: ka:ri: + gər + i:

Schwa in these words therefore is never in the right environment for the
application of desyllabification and the question of deleting it does
not arrive.

(Morpheme boundaries block the application of phonological rules in
several other languages.[8] In Arabic there is a rule of vowel deletion:
V -> Ø/[CVC__CVC], which applies when there is a morpheme boundary
to the left but not when there is one to the right (Hudson n.d.). Tonkawa
(Kenstowicz and Kisseberth 1979) also has a rule of vowel deletion:
V -> Ø/#CVC__CV which is blocked by a morpheme boundary to the right.
Hindi therefore seems to fit a pattern and it is likely that syllable
accenting can account for Arabic and Tonkawa as it does for Hindi.)

2.7 Summing Up.
So far I have shown that a non-linear analysis allows for a
simple and insightful account of the schwa deletion phenomenon in that
all the data are accounted for by two fairly straightforward rules,
schwa desyllabification (20) and schwa reinstatement (27), without the
need for conditions and stipulations. The same rules with a simple re-
ordering (32) account for dialectal differences, and with the addition
of initial accenting (37), for non-application of desyllabification
across morpheme boundaries to the left of the schwa.

In addition, this approach to schwa deletion suggests a possible account of word internal non-deletion in slow speech i.e., alternations like: ka:dəmbəri:~ka:dəmbri:. Since schwa is desyllabified, not deleted, the X slot (which is a timing unit) and the schwa are present right up to surface structure. I suggest that in slow speech the timing slots are given equal importance (Hindi-Urdu is a syllable timed language) and in this case the X structure is reinstated as a syllable head. Of course since the X structure is not a syllable it will not get the same weight a syllable would. It does however get some weight and this triggers a surface level equivalent of schwa reinstatement.

3.0 Vowel Nasalization.

In this section I will examine the interaction of schwa deletion and vowel nasalization and will show how this interaction provides evidence for treating nasal vowels as an underlying sequence of vowel and nasal consonant thus reducing the phonemic inventory of the language significantly.

The nasalized vowels in Hindi-Urdu have received varying treatments. Some writers claim that the language has a set of nasalized vowels in addition to the oral ones (Ohala 1972) while others claim that all nasalized vowels can be derived from oral ones (Narang and Becker 1971). Narang and Becker propose that nasalized vowels be treated as an underlying sequence of oral vowel and nasal consonant. They advance this analysis on several grounds, the strongest to my mind being the fact that in Hindi-Urdu most nasalized vowels are long. There are very few short nasalized vowels in the language. The advantage of an analysis like Narang and Becker's over one like Ohala's is that it allows for a considerable economy in the phonemic inventory of Hindi-Urdu and if viewed autosegmentally can account for the length of nasal vowels.

Narang and Becker set up the following rule to account for nasalization in Hindi-Urdu:

$$(39.)\ \begin{bmatrix} +\text{syllabic} \\ +\text{tense} \end{bmatrix}\ \begin{bmatrix} +\text{nasal} \end{bmatrix}\ \text{C}\ \longrightarrow\ \begin{bmatrix} +\text{nasal} \end{bmatrix}\ \emptyset\ 3$$
$$\qquad\qquad\ 1\qquad\qquad\ 2\quad 3\qquad\qquad\ 1\quad\ 2$$

The interaction of schwa syncope and vowel nasalization provides evidence in favor of Narang and Becker's approach because schwa syncope seems to treat nasalized vowels as a sequence of vowel and nasal i.e., when a schwa is preceded by a nasalized vowel it does not delete just as it does not delete when preceded by a consonant cluster.

(40.) ã:gən   ã:gənõ: 'courtyard'   *ã:gnõ:
       bʰã:y̆ək   bʰã:y̆əkõ: 'rope maker'   *bʰã:y̆kõ:
       ã:čəl   ã:čəlõ: 'corner'   *ã:č:õ:

Narang and Becker order their rule of schwa deletion after their rule of nasalization. They do this so that they can account for forms like ã:gən,ã:gənõ: 'courtyard/s'.

(41.) UR   /aːNgən + oːN/
     schwa deletion   ------------
     nasalization   ãːgənõː
     PR   ãːgənõː

If nasalization applied first schwa deletion could also apply giving the
wrong output: *ãːgnõː.

However, as Bhatia and Kenstowicz (1972) point out, this rule
ordering results in an ordering paradox. Narang and Becker cannot
account for forms like the following if they allow schwa deletion to
precede nasalization:

(42.) maːnəs   maːnsiː   'mind'
     kiːmət   kiːmtiː   'price'
     daːnəw   daːnwõː   'demon'

Words like these surface with a long oral vowel followed by a nasal
consonant yet schwa deletion has applied. Given Narang and Becker's
rule ordering the wrong surface representations will be obtained for
these words:

(43.) UR   /daːnəw + oːN/
     schwa deletion   /daːnwoːN/
     nasalization   /dãːwõː/
     PR   *dãːwõː

The corect forms could be obtained if schwa deletion was ordered
after nasalization but then the wrong output would be obtained for words
like ãːgənõː.

Bhatia and Kenstowicz (1972) suggest that the problem is one of
derivational history, nasalization applying only to underlying V:NC
sequences not derived ones, and advocate the use of global rules as a
possible solution. Global rules allow one to describe derivational
history without recourse to rule ordering. However, global rules are
undesirable in that they add too much power to the grammar (Kiparsky
1973). One of the great advantages of an approach involving syllable
structure is that the need for global rules is largely eliminated. Levin
(1984) has shown this for Klamath, Archangeli (1984) has shown it for
Yawelmani and this study shows it for Hindi-Urdu. The question as to what
it is that syllable structure provides that makes global rules unnecessary
is a question worth investigating. One possible answer comes from the
fact that global rules are necessary in cases in which one has to refer
to two levels of structure or in other words to two points in a
derivation. Non-linear phonology provides this information, not as a result
of global power, but as a consequence of the representation. As the
evidence below will demonstrate, the fact that one can refer to several
tiers of information at the same time is crucial to the analysis of vowel
nasalization. Linear phonology could only get this information by adding
power to the grammar. Autosegmental phonology gets it as a basic part of
the theory.

Further, problems are inherent in the way Narang and Becker formulate their rule. Theirs is a morpheme based rule and they crucially rely on it applying in the environment of a consonant to the right of the nasalized vowel. They therefore have to resort to ad hoc rules in order to account for forms like the following in which a nasalized vowel is found at the end of the word.

(44.)	mã:	'mother'	d^huã:	'smoke'
	lərkõ:	'boys'	hã:	'yes'

The main defect in Narang and Becker's analysis is that they base their rule upon the observation that "within a morpheme long vowels do not occur before a nasal consonant cluster". They cite the word sa:nt as an exception. However, as Bhatia and Kenstowicz have pointed out there are several other such "exceptions" e.g.,

(45.)	pra:nt	'district'
	ka:nta:	'wife'
	a:ntrik	'internal'

Looking at nasalization in terms of syllable structure allows for the formulation of a rule which accounts for all the facts without falling foul of the ordering paradox and without having to invoke the power of global rules. Further, if we take the nasal vowels as being underlyingly short rather than long we can account for the data and also for the fact that there are very few short nasalized vowels in Hindi-Urdu.[9]

I suggest that a word like ã:gən has the following underlying representation:

(46.)

XXXXX

aŋgən

The nasal consonant is in the coda and linked to an X slot in under-lying representation.

To deal with nasalization I adopt a coplanar representation of features (Archangeli 1984) and suggest that the feature [+nasal] is on the same plane but off on a separate tier from the other features:

(47.) ŋ

[ ]

[+nas]

A rule of nasal spread causes this feature to spread onto the preceding vowel in case there is a nasal in the coda in underlying representation.

(48.) <u>nasal spread</u>

```
      ___                          ___
     |   \                        |   \
     X    X    ---→        X       X
     |    |                |       |
    [ ]  [ ]              [ ]⟍    [ ]
    +N                    +N ⟍
     |                         ⟍|
   [+nas]                    [+nas]
```
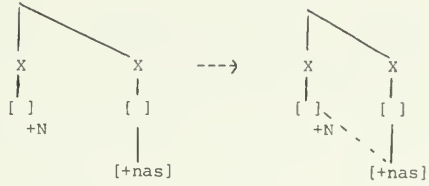
The feature [+nasal] spreads to the vowel and the vowel spreads to the X slot in the coda by a rule rather like the (universal) rule of long vowel formation except that it is ordered to apply after nasal spread.[10]

(49.) <u>vowel spread</u>

```
      ___                          ___
     |   \                        |   \
     X    X    ---→        X       X
     |    |                |⟋⟋    ⟋
    [ ]⟍ [ ]              [ ]⟍   [ ]
    +N ⟍                  +N ⟍
        ⟍|                    ⟍|
      [+nas]                 [+nas]
```
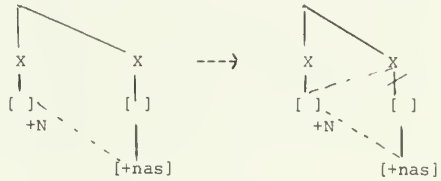
   Pulleyblank (1983) argues convincingly for the position that if
something is linked by rule to an already linked slot the original
association line is automatically broken. Thus vowel spread results in
the delinking of the other features attached to X. Let us look at
a sample derivation. (For convenience, I leave out at each stage
information not directly relevant to that stage.)

(50.) UR

```
        ∧ |
       XXXXX
         |
       angən
```
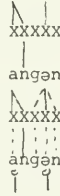
by syllabification (16)
and foot const. (18):

```
       ∧ ⟋∧
      XXXXX
      : | : :
      angən
      ⌣  ⌣
```

by nasal spread[11] (48):

```
     ∧      ⟋⟋|⟍
     X  X  X  X  X
     :  |  :  :  :
     a  n  g  ə  n
     |     |
    [ ][ ]
    +N⟍|
     [+nas]
```

by vowel spread (49):

```
     ∧    ⟋⟋|⟍
     X X X X X
     : | : : :
     a n g ə n
     |⟋⟋
    [ ][ ]
    +N⟍|
     [+nas]
```

PR
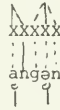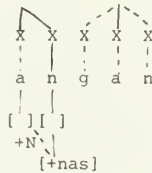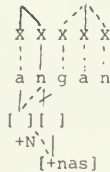
```
       ã:gən
```

It may be recalled that the interaction of schwa deletion and nasalization led to an ordering paradox for Narang and Becker. Given the present analysis no such paradox arises. The following derivations show the interaction of schwa syncope and nasalization in forms that proved problematic for Narang and Becker:

(51a.)   ã:gənõ: 'courtyard'   da:nwõ: 'demon'

UR   XXXXXXX   XXXXXXXX
                                          angənon   da nəwon

syllabification (16)   XXXXXXX   XXXXXXXX
and foot const. (18):   angənon   da nəwon

schwa desyll. (20):   XXXXXXX   XXXXXXXX
                                          angənon   da nəwon

core syllab. (16):   -------   XXXXXXXX X
                                                                da nəwon

schwa reinst. (27):   XXXXXXX   _____
                                          angənon

core syllab. (16):   XXXXXXX   -------
                                          angənon

The schwa facts have now been accounted for. The nasalization facts can be accounted for as follows:

(51b.)
nasal spread (48):   X X X X X X   X   X X X X X X X   X
                         a n g ə n o   n   d a   n ə w o   n
                         [ ][ ]   [ ][ ]   [ ][ ]
                         +N   +N   +N
                         [+nas]   [+nas]   [+nas]

core syllab. (16)   ----------------   ----------------

vowel spread (49):   X X X X X X   X   X X X X X X X   X
                         a n g ə n o   n   d a   n ə w o   n
                         [ ][ ]   [ ][ ]   [ ][ ]
                         +N   +N   +N
                         [+nas]   [+nas]   [+nas]

```
core syllable (16):        --------          --------
PR                         ã:gǝnõ:           da:nwõ:
```

No matter how the rules are ordered, the correct results are obtained
because the coda position is filled in underlying structure and so
prevents core syllabification from incorporating any other element into
the coda. This analysis crucially depends on the distinction between
solid lines and broken lines which allows the differentiation of elements
incorporated into the syllable by rules and those present in underlying
representation. Without this distinction it would not be possible to
differentiate between nasals which are a part of the syllable in UR and
affected by nasal spread and those incorporated into the syllable by rule
and immune to nasal spread.

The rule ordering necessary to account for the ǝ/∅ alternation in
Dialects A and B makes certain predictions about ǝ/∅ alternation after
nasal vowels, namely that in Dialect A schwa should not delete when
preceded by a nasal vowel while in Dialect B schwa should delete in this
environment. In fact these predictions are borne out and in Dialect B
one finds alternations like the following:

(52.) ã:gǝnõ: ~ ã:gnõ: ã:čǝlõ: ~ ã:člõ:

while in Dialect A *ã:gnõ:, *ã:člõ:. We have already seen a sample
derivation from Dialect A; given below is the derivation of the word
ã:gnõ: in Dialect B.

(53.) after schwa

```
                              ∧  ∧
                              xxxxxxx
                              ¦¦'¦¦¦
                              angǝnon
                              ∟  ∤
```

     desyllab. (20):

     core syllab. (16):   -------

     extended syllab. (30):

```
                              ∧  ∧
                              xxxxxxx
                              ¦¦¦¦¦
                              angǝnon
```

     schwa reinst. (27):   -------

(Nasal and vowel spread are not affected by any of these processes
because they take place on a different plane.)

Thus an additional benefit accruing from the treatment of nasal
vowels as a VC sequence is that it makes possible a single unified
account of both extended applications of schwa syncope. Narang and
Becker, however, were unable to reap this benefit in their linear
analysis.

4.0 Conclusion.
What I have sought to demonstrate is that a syllable based
approach to phonological processes, schwa syncope and vowel nasali-
zation in this instance, provides a relatively simple, motivated account

of the phenomena. It accounts for all the Hindi-Urdu data with a few rules most of which are independently needed in the language. I have also shown that the nasal vowels in Hindi-Urdu can be treated as a sequence of vowel and consonant thus achieving a considerable economy in the phoneme inventory of the language. Vowel length is easily explained, and I have shown that syllable structure accounts for facts that seem arbitrary stipulations in a linear analysis and eliminates the need for global rules. The latter is an important consequence of non-linear phonology and makes a case for the need for several planes of representation so that information crucial to a derivation is available on some plane at every point in the derivation. Linear phonology can only get this information by adding power to the grammar whereas non-linear phonology gets it as a natural consequence of the theory. The implications of this are worth investigating.

Of theoretical interest is the fact that this segment of Hindi-Urdu phonology can be dealt with by means of an X skeleton and a fairly straightforward structural distinction between +N and -N elements. No need was found for CV labels (Clements and Keyser 1983) or for a hierarchical structure as proposed by Levin (1984). Of course this paper looks at but a small part of the phonology of Hindi-Urdu, however, the fact that this complex little area does not require CV labels or an elaboration of structure is of some significance.

NOTES

[1] This paper has benefited greatly from discussions with Diana Archangeli. Thanks are also due to Hyang Sook Sohn for her valuable comments, and to Yamuna Kachru and Rajeshwari Pandharipande for help with the data. Any faults are of course mine.

[2] The language described here is Hindi-Urdu or Standard Hindi. Hindi-Urdu is the language used by educated native speakers in every-day conversation.

[3] The colon : denotes length.

[4] The various sources cited use different systems of trans-cription; I have standardized all forms to provide uniformity.

[5] In H-U the long vowels are [+tense] the short vowels are [-tense].

[6] Clements and Keyser formulate the principle as follows: "Syllable-initial consonants are maximized to the extent consistent with the syllable structure conditions of the language in question."

[7] According to Archangeli (1984) core syllabification rules apply automatically after the application of any rule. The consonant stranded by schwa deletion is thus automatically taken into an adjoining syllable, in this case the preceding one since it has no coda and the following syllable already has an onset.

29

[8]I am grateful to Diana Archangeli for bringing this to my attention.

[9]Assuming that all long nasal vowels are underlyingly short enables one to account for the fact that on the surface one finds very few short nasal vowels but a plethora of long ones. The few forms with short nasal vowels can be treated as lexically marked exceptions. This is not an unmotivated move for as Ohala (1972) observes, "Interestingly since the short vowel forms go against the general tendency of the language, many times the nasalization is lost, i.e. native speakers seem to treat these as exceptions."

[10]It is here that the advantage of an X skeleton becomes obvious. If a CV skeleton had been used one would have to link a vowel to a C slot, not a very desirable move.

[11]The nasalization facts can also be dealt with if we assume a biplanar representation of features e.g.

```
    [+nas]                                      [+nas]
      |                                          ⁄⁻ |
    X   X          Rules 48 and 49 apply        X    X
    |   |                                        |⋅⁻⁺
   [ ] [ ]                                      [ ] [ ]
    +N                                           +N
```
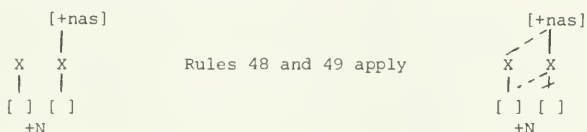
a uniplanar representation however would give the wrong results, unless one added a stipulation to the effect that all features but nasal delete e.g.

```
     X    X
     ⌊⁻⁻⁺
    [ ] ⁻⁻[ᵑ]⁻⁐ ∅
     +N
```
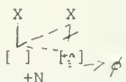
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SWAHILI POLICY IMPLEMENTATION IN TANZANIA:
THE ROLE OF THE NATIONAL SWAHILI COUNCIL (BAKITA)[1]

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This paper describes the structure and activities of the National Swahili Council (BAKITA), the official governmental agency in charge of the coordination and implementation of Tanzania's Swahili lanugage policy. One of BAKITA's activities, the preparation of new vocabulary for subjects where Swahili has not previously been used, has been criticized in preliminary evaluations which show that the new vocabulary is not readily accepted. It is suggested here that problems in the creation, dissemination, and acceptance of new vocabulary might be avoided through the adoption of a model of the vocabulary expansion process such as that proposed by Marshad (1984).

Following Kloss' (1969) definition, language planning may be divided into status planning and corpus planning. The former set of activities includes the allocation of languages to various functions within the community (often nation), and is usually the result of policy making. Corpus planning includes the standardization, elaboration and codification activities necessary to enable the languages to fulfill their designated functions. While these two sets of language planning activities are often carried out by different organizational structures, the basic claim that this paper demonstrates is that a model of corpus planning cannot be constructed without a clear, well supported language policy.

Few studies have appeared on the organizational structure and actual operation of specific language (=corpus) planning agencies (Fellman and Fishman, 1977). Fellman and Fishman (1977), for example, give a summary of the activities and organization of two committees of the Hebrew Language Academy. Their goal is to examine the actual functioning of the language planning process in order to eventually include the workings of the language planning bodies (their membership, structure, work habits, etc.) as variables for study and evaluation in the language (=corpus) planning process. In the case of Israel, however, the modernization of Hebrew received full governmental and institutional backing. Furthermore, the high level of education and literacy of Israeli citizens provided a foundation for the development of modern Hebrew.

The purpose of this paper is to examine the workings of another language planning agency, The National Swahili Council (BAKITA), which operates in a different sociolinguistic environment than the Hebrew Language Academy. Although in many ways the processes and problems facing vocabulary planners are the same everywhere, the study of BAKITA shows that the overall success of such organizations depends on their having a model of the vocabulary expansion process that provides for a realistic view of the sociolinguistic situation (users/audience etc). Such a model cannot be formed without a clear language policy. This was lacking in Tanzania,

especially in the educational sector. Now that this has been clarified, however, language planners in Tanzania are better equipped to construct a model of the vocabulary expansion process.

In this paper I will describe the structure and operation of BAKITA, focusing on problems currently under treatment. First I will present a brief summary of contemporary Tanzanian language policy and the history of Standard Swahili in order to put the work of BAKITA into perspective. The main part of the paper is divided into two sections. The first describes the organizational structure, membership and duties of BAKITA. The second provides examples of problems currently being dealt with at BAKITA. The paper concludes with observations on the organization's success in achieving its goals. Recommendations are made, in light of recent modifications in educational language policy, for improving Bakita's effectiveness in implementing the policy through the adoption of a model of vocabulary expansion.

Background

The United Republic of Tanzania, located on the East African Indian Ocean coast between Kenya to the north and Mozambique to the south, has a population of approximately 19 million people who speak over 120 languages. Languages belonging to all the major African language families are spoken in Tanzania (Nilotic, Khoisan, Afro-Asiatic and Niger-Congo). However, the majority of Tanzanians are speakers of Bantu languages, one of the branches of the Niger-Congo family (Polome', 1980). Two languages, English and Swahili, serve as lingua francas, though their functional allocation is quite different. English, taught as a school subject and used as the medium of instruction in post-primary education, is known by a very small proportion of the population. Swahili, on the other hand, as the national and official language, serves as the medium of primary education, and is the language of wider communication. Swahili is known by well over 90% of the population.[2]

Swahili spread as a lingua franca throughout East Africa, but especially in Tanganyika, shortly before and during the colonial era.[3] Its spread was accelerated by the necessities of colonization, world wars, and the independence movement, during which it became the medium of national unity (Abdulaziz, 1972a). Shortly after Independence in 1960, Swahili was declared the national and official language. In 1967, it was declared the medium of instruction in all primary schools as well as the required medium for all official government communication. Also in 1967, the Baraza la Kiswahili la Taifa - BAKITA - (the National Swahili Council) was formed to implement Tanzania's official Swahili language policy.[4]

Language policy in Tanzania refers overtly to the use of Swahili and English in two sectors of national life, government and education (Dunn, 1984). The policy has evolved since Independence through the statements of individuals in policy-making positions. According to the policy, Swahili is to be used as the medium of participation in national affairs at all levels and in all branches of the government, though in practice, in a few areas such as at the higher levels of the legal system, English is used. Swahili is also the medium of primary education and primary teacher training. Policy formulated in the late 1960s and early 1970s called for the switch

from English to Swahili as the medium of instruction at the secondary, and eventually at the tertiary, levels. However, following a long period of uncertainty, this policy was officially reversed in 1983 by the Minister of Education and in 1984 by the President. Speaking at the opening of a seminar of UKUTA (Usanifu wa Kiswahili na Ushairi Tanzania – Tanzanian Society for Standardization of Swahili and Poetry) President Nyerere confirmed that the policy had been changed.

> 'English is the Swahili of the world and for this reason must be taught in [Tanzania]...'...The President added that English will indeed be the medium of instruction in secondary schools and institutions of higher education. (Mzalendo, October 28, 1984).[5]

In the governmental sector, where the Swahili language policy has been clear and well articulated, implementation proceeded well. In the educational sector, on the other hand, the vacillation among policy makers as to whether the go-ahead would be given for the use of Swahili as the medium of secondary education caused a certain amount of uncertainty among language planners. While vocabulary lists and a number of Swahili textbooks were prepared in anticipation of the switch-over to Swahili medium, without a clear sense of whether Swahili would actually be allocated for use in this function, work did not proceed at a rapid pace. Since 1983, however, the status of Swahili in the educational sector seems clear, and the task of corpus planners, therefore, better defined than in the past. Since the policy seems to limit the role of Swahili in the educational sector to primary and adult education, BAKITA can coordinate the task of vocabulary expansion with these audiences in mind, producing vocabulary which will be acceptable to them.

Kiswahili Sanifu (Standard Swahili) is the variety of Swahili which is referred to in Tanzania's language policy and whose correct use and elaboration is of concern to BAKITA. Standard Swahili formally came into being in the 1930s when the members of the Inter-territorial (Swahili) Language Committee selected the dialect of Swahili spoken in Unguja, the main town of the island of Unguja (Zanzibar), as the basis for the standard language (Whiteley, 1957, 1969). This committee, composed of European representatives from each of the territories of East Africa, sought to normalize the use of Swahili, particularly in education, in order to make possible the use of standard textbooks and examinations throughout the territory. For a short time, the committee held an imprimatur on the publication of all Swahili books, but this control was lost with the expansion of Swahili publishing after World War II. The committee's early work also included the revision of the Swahili/English, and the production of the English/Swahili dictionaries (Interterritorial Committee, 1939) which served virtually as the only dictionaries of the language until the publication in 1980 of the Kamusi ya Kiswahili Sanifu (Standard Swahili Dictionary) (Institute for Kiswahili Research).

After World War II, the committee, now comprised of European and African members, retained its authority in matters of Swahili usage, although exercise of this authority was limited due to the static budget of the committee and the creation of the East African Literature Bureau which oversaw Swahili publications and was not obliged to seek the imprimatur from

the committee (Whiteley, 1969). Most of the committee's attention during the last decade before Independence was devoted to the collection of traditional Swahili manuscripts and to the production of a series of monographs on the Swahili dialects. Throughout its life the committee published its Bulletin, later called Journal and later Swahili (now Kiswahili), which forms a valuable repository of studies on Swahili language and literature.

In the decade after Independence, the duties of the committee were distributed among the two language treatment agencies currently operating with government funds in Tanzania. The Taasisi ya Uchunguzi wa Kiswahili (the Institute for Kiswahili Research – TUKI) formed in 1964 and located at the University of Dar es Salaam, is the direct descendant of the committee. With its staff of linguists and language scholars, TUKI is primarily responsible for Swahili research and lexicography, that is the academic aspects of the implementation of Tanzania's Swahili language policy. BAKITA, created in 1967, inherited the authority that the committee exercised to establish standard Swahili usage, including supervising the expansion of vocabulary in technical fields. This two-pronged approach to the development of Swahili creates a situation of conflict of authority which has undoubtedly had an effect on the implementation of the nation's Swahili language policy.

Structure of BAKITA

BAKITA is the official body charged with coordinating the implementation of Swahili language policy in Tanzania. Formed by an act of Parliament in 1967, the duties of BAKITA are similar to those of the former Inter-territorial (Swahili) Language Committee (Whiteley, 1957, 1969). BAKITA seeks to further the development and use of Swahili in Tanzania; to motivate the use of Swahili in all spheres of public life; to encourage cooperation with other groups concerned with the development of Swahili; to prescribe correct use of Swahili and to prevent incorrect use; to oversee the translation of technical terms, to produce journals and pamphlets concerning the correct use of Swahili; to serve the government and public corporations as well as private individuals in solving problems which arise from the use of Swahili in their activities (Irira, 1983). As a result of a 1983 amendment to the law forming BAKITA, which enables the organization to establish international contacts, the organization's goals have been expanded to include cooperation with neighboring East African countries in the promotion and development of Swahili, as well as with those involved in the teaching of Swahili as a foreign language in Tanzania and abroad.

BAKITA, as a parastatal organization, is a semi-autonomous governmental body under the policy direction of, and financially dependent upon, the ministry to which it is attached. In the past BAKITA has been attached to the ministries of Regional Administration and Rural Development (1968), National Education (1969-1973) and Youth and National Culture (1973-1979). BAKITA has been part of the Ministry of Information and Culture until its reorganization as part of the Prime Minister's office in 1984.

Internally, BAKITA consists of two main divisions, the Baraza (council) and the secretariat. The Baraza, whose chairman is appointed by the President, is the authoritative body of BAKITA. The full Baraza meets two

times per year as do each of its committees: standardization, translation, editing and publication, and grammar and imprimatur. Its 53-person membership is selected from every region and language-related institution in the country, and has final authority on decisions affecting Swahili. Delegates to the Baraza are chosen on the basis of their interest and experience, professional or non-professional, in the Swahili language, not necessarily for their expertise in the formal study of language. The delegates to the Baraza are appointed by the minister to whose ministry BAKITA is attached based upon the recommendations of the executive committee of BAKITA. All delegates to the Baraza serve a concurrent three year term after which the Baraza is dissolved and reconstituted.

The Secretariat of BAKITA, which consists of 24 full-time employees responsible for the day-to-day activities necessary to prepare work for the Baraza's approval, is divided into departments which correspond to the committees of the Baraza: standardization, translation, editing and publication, and grammar and imprimatur. Eleven of the 24 employees are academic staff with training to the Bachelor's degree level in a language-related field, though not in terminology, lexicology or language planning. In addition, the secretariat also has the department of finance and management, and the office of the executive secretary which oversees the functioning of the organization.

The academic employees of BAKITA are those who do the research and coordination of efforts involved in developing and standardizing Swahili. They are present but do not vote at the meetings of the Baraza and its committees, where one member from each department serves as secretary of the committee to which his/her department is responsible. The academic employees also act as representatives of the Baraza in various situations where issues of language use arise. The disbursement of funds is controlled, and the calendar for the Baraza is planned, by the executive committee which consists of the executive secretary and several members of the Baraza. The chairman of the Baraza is also chairman of the executive committee.

The work of BAKITA's committees is summarized below; issues arising from the work are discussed in the following section of the paper.

The committee/department on language standardization is primarily responsible for setting guidelines for and for overseeing lexical elaboration. The department prepares and disseminates lists of terms prepared by their members of staff in cooperation with other agencies. Inquiries from writers concerning vocabulary are directed to this department. This department also cooperates with the department/committee on grammar and imprimatur in resolving problems of usage which arise in the vocabulary expansion process. The results of the department's efforts are approved by the committee on standardization of the Baraza, as well as the full Baraza, after which they may appear in <u>Tafsiri</u> <u>Sanifu</u> (Standard Translations), the list of official translations. The department of language standardization also prepares monolingual classified vocabularies; however, none of these have been published due to budgetary restrictions.

The grammar and imprimatur committee/department is concerned with problems of correct usage. This department conducts research into

grammatical problems arising from the vocabulary expansion process as well as into trends in usage. The department also attempts to control usage in the media by occasional monitoring of the radio and newspaper. Manuscripts for school texts and other books are brought to this department for approval of the language before being sent for publication. The decisions on usage reached by this department/committee are disseminated in the pamphlet series Jifunze Kiswahili Uwafunze Wengine (Learn Swahili to Teach Others).

The department/committee on translation is divided into two sections, the first deals with the translation from European languages into Swahili, and the second with translation into Swahili from the ethnic group languages of Tanzania. The department was created in 1977 at the request of the Chama cha Mapinduzi (the sole political party) in order to fill the need for books in Swahili (Sambazi, 1984). At that time, a list of 25 books on politics, economics and development was suggested for translation. A number of these have been or are in the process of being translated. In addition, the department also translates school texts and reference books as well as forms and pamphlets from government departments, public corporations, government ministries and private individuals. The translation department also translates written and oral literature from other Tanzanian languages into Swahili as a way both to preserve traditions and to enrich the vocabulary of Swahili by borrowings from ethnic group languages.

The editing and publications department/committee is concerned with the dissemination of the views and decisions of BAKITA via publications and the mass media. The weekly radio program Lugha ya Taifa (National Language) deals with efforts by people around the country to promote the use of Swahili as well as with the work of BAKITA. The journal Lugha Yetu (Our Language) which appears two times per year carries articles written in Swahili on introductory topics in linguistics, correct usage, poetry and other forms of Swahili literature, as well as lists of standard translations. Tafsiri Sanifu (Standard Translations) provides bilingual English-Swahili lists of equivalents which have been approved by the Baraza. The pamphlet Jifunze Kiswahili Uwafunze Wengine (Learn Swahili To Teach Others), prepared by the department of grammar and imprimatur, gives points on correct Swahili usage such as distinguishing often confused pairs of words. This department also cooperates in the annual book display, staged at the national trade fair.

Activities of BAKITA

Since its inception in 1967, BAKITA has grown from a one-member staff, forced to share office space with the National Youth Organization, to a staff of over 20 members, occupying their own office space in the center of Dar es Salaam. The organization's early work concentrated on implementing the use of Swahili in the governmental sector through activities designed to raise the status of Swahili and persuade all members of the public sector to use Swahili in their offical communications (BAKITA, 1969-1981). In order to assist in this endeavor, BAKITA coordinated the preparation of lists of Swahili words for office and factory names and titles, as well as the translation of forms, oaths, receipts and other paraphernalia of bureaucracy. Once Swahili was firmly established in the governmental arena, BAKITA turned its attention to the preparation of vocabulary to make Swahili an adequate instructional medium for all school subjects. With an expanded

staff, BAKITA has focused in recent years on lexical elaboration and the problems arising from this task, while continuing to prescribe Standard Swahili usage.

Prescribing Usage

The definition of correct usage is an on-going process, particularly in the sociolinguistic situation in which Swahili is found. Despite the fact that nearly all Tanzanians speak Swahili, many speak it as a second language and their competence in it varies depending on such factors as urban or rural living environment, degree of proximity to the coast, degree of monolingualism among speakers of the ethnic group (first) language, extent of opportunities for travel, and degree of formal education. Knowledge of Standard Swahili is favored by opportunities for schooling beyond the third grade level, for travel and work outside the ethnic group area, and by urban living. In such a setting, variation in Swahili is to be expected. BAKITA's staff proposes standard usage to normalize this variation. Recent standardization activities have included development of a standard style sheet for use by writers and editors, a call for the elimination of the influence of English on Swahili, regularization of the orthography, and clarification of isolated cases of poor usage (e.g., confusion of near synonyms, incorrect pluralization, or incorrect agreement).

The pamphlet Jifunze Kiswahili Uwafunze Wengine (Learn Swahili to Teach Others, BAKITA, 1983), a guide to correct Swahili usage, warns against the influence of English. This influence occurs in several forms from the overt mixing of English and Swahili (Waombaji wawe na license class C – 'Applicants should have a class C license ' instead of Waombaji wawe na leseni daraja la Ch) to the translation of English idioms into Swahili (kukamata basi 'to catch a bus' instead of kupanda basi 'to board a bus'). The influence of English is also seen in the abbreviations of the names of public corporations. While the name in its full form is given in Swahili, the commonly used abbreviation, even when written in Swahili, is based on the former English name, a practice which BAKITA is attempting to change. Thus, for example, the commonly used abbreviation of Benki ya Biashara ya Taifa is NBC, from the English name National Bank of Commerce. Similarly, University of Dar es Salaam is abbreviated UDSM, rather than CKDSM, the abbreviation of the Swahili translation Chuo Kikuu cha Dar es Salaam.

Currently, BAKITA is also suggesting orthographic changes which would effect a very small number of words in the lexicon. While in most cases Swahili orthography is extremely phonemic, in a few cases the syllabicity of an initial nasal, which is not indicated by the current orthography, serves to distinguish two words. For example /mbu-ni/ (two syllables) 'ostrich' and /m-bu-ni/ (three syllables) 'coffee plant' are both spelled mbuni. Similarly, /mba-ya/ (two syllables) 'bad, modifying class 9/10' and /m-bay-a/ (three syllables) 'bad, modifying class 1 or 3' are both spelled mbaya. In other cases, although no homographs exist, the spelling does not indicate the status of the nasal. Thus words such as nje 'outside', nge 'scorpion', or mbwa 'dog', give no clue to the fact that their nasals are syllabic. The failure to indicate the status of the nasal is felt by BAKITA and some language teachers to pose problems for learners of Swahili.

In order to rectify this perceived deficiency, BAKITA has proposed to

indicate a syllabic nasal by either doubling the nasal or by separating the nasal from the following consonant with an apostrophe. According to the first proposal, words with syllabic nasals would be written with a double consonant as in mmbuni 'coffee plant', or nnje 'outside'. Words with non-syllabic initial nasals would be written following the former spelling; mbuni 'ostrich' and mbaya 'bad, modifying class 9/10'. The second proposal involves the use of an apostrophe to indicate syllabicity. Thus 'coffee plant' and 'outside' would be spelled m'buni and n'je respectively. Non-syllabic nasals would retain the original spelling. At present BAKITA has called for more research into the need for such orthographic changes. Before any changes are decided upon by the Baraza, the organization will seek the full cooperation of Swahili experts as well as input from the public.

Lexical Elaboration

By virtue of its very nature as a body dedicated to the development and promotion of Standard Swahili, BAKITA's activities are fundamentally prescriptive. However, BAKITA also assumes an elaborative role in order to extend the use of Swahili to areas where it had not previously been used, for instance in publications for the general public on technical topics, such as photography, knitting, nutrition, shorthand, carpentry, etc, or in the preparation of materials for the upper primary school subjects. In this task BAKITA works with other organizations and individuals to expand the vocabulary of Swahili in order to fill the lexical gaps felt primarily by writers as they write on subjects in Swahili for the first time. In concerning itself with lexical elaboration BAKITA is fulfilling the purpose for which it was created, the development of Swahili. At the same time, BAKITA is attempting to mediate the influx of new words into the language by establishing guidelines for their acceptance.

Guidelines for Vocabulary Expansion

In their discussions, delegates to the standardization committee meetings attempt to follow criteria for the source and structure of the words to be standardized (BAKITA, n.d.; Irira, 1982). Criteria concerning the source for borrowing specify that vocabulary items are to be taken from the following languages or groups of languages in order of preference: Swahili; other Tanzanian Bantu languages; other African languages (excluding Arabic); foreign languages. Words taken from Swahili may be taken from any of its dialects (kisabeho 'breakfast'< Kipemba), or they may be morphological derivations on existing roots (kitenguo 'derivative' < kutengua 'to separate'). Existing Swahili words are also used to form new words by compounding (pembenane 'octagon' < pembe 'corner' and nane 'eight') or by the shortening of nominal phrases (kiuavijasumu 'antibiotic' < kitu cha kuua vijidudu vya sumu 'something to kill very tiny poisonous insects'). The semantically opaque words obtained by this method, however, are often not acceptable to members of the standardization committee.

While other Bantu languages may serve as sources for vocabulary expansion in Swahili, in practice, there is little systematic surveying of these languages for words that would fill the gaps that have been identified, partly due to a lack of reference materials for these languages, and partly due to the fact that these languages are not used in the subjects

for which words are sought (as is English, for example). Words from ethnic group languages most often find their way into standard Swahili through the presence, at some stage of the vocabulary translation and standardization process, of a speaker of that language who suggests that his or her language has a suitable word for the concept under discussion. After the meaning and context of use of the word is explained to other members, and the committee is satisfied, the word is adopted (e.g., fuwele 'crystal' < Kizigua,'a soft, breakable stone', or ikulu 'statehouse' < Kinyamwezi/Kisukuma). Much the same procedure applies to the use of non-Tanzanian African languages as a source for vocabulary expansion. In this case, as there are few non-Tanzanian Africans present during the vocabulary expansion process, few words from other African languages are adopted.[6]

English is clearly the first non-African foreign language source from which vocabulary is borrowed. Arabic, an African language, and the main source for borrowing in the past, is now stated to be in the least preferred position; however, in practice which language acts as a source depends on the subject for which vocabulary is sought. The strength of English as a source, for example, is felt most in technical fields, while Arabic words are more often used in the humanities. Thus, of the 121 borrowed words in the list of 349 biology terms (BAKITA, 1980), all are from English. In contrast, in a list of 243 literature terms (BAKITA, forthcoming) only five are borrowed from English while perahps half are words of Arabic origin, most of which are semantic and/or morphological extensions of nativized words. This difference, of course, reflects the dynamics of the contact situation in which Swahili finds itself: English, as the medium of higher education, is the language of the technical registers. On the other hand, since Arabic has contributed for a long time to the development of Swahili culture, it is not surprising that words needed for a register of literary criticism should come from the Arabic part of the Swahili lexicon or from Arabic itself.

In addition to specifying the source from which vocabulary expansion may draw, BAKITA also attempts to control the structure of the words and their integration into the grammatical system of the language. Guidance in the first task is achieved by prescribing rules for the nativization of borrowed words. The department of standardization has a policy of nativization of borrowed words which states that all words, except names of individuals, will be modified phonologically to conform to the sound system of Swahili by the addition of a final vowel for words which are consonant final in the source language, and by the insertion of vowels to break up impermissible consonant clusters (Irira, 1983). Overly long words, created by compounding, are also discouraged.

As a result of these guidelines, words ending in m have a u added: sodium–sodiamu, ileum–ilamu, calcium–kalisiamu. Words ending in other consonants have an i added: protein–protini, auricle–orikali, cellulose–sellulosi. Vowels are introduced word-internally in a number of cases to break up consonant clusters which are not permitted in Swahili. So calcium is rendered as kalisiamu and cytoplasm as sitoplazimu. In other cases, consonant clusters are simplified by the deletion of one or more of the members: organ–ogani, artery–ateri, thermometer–themometa, metabolism–metaboli. As these examples show, vowel phonemes may also be modified in the process of nativization in order to make them conform more

closely to the Swahili sound system although no guidelines for these modifications are provided by BAKITA.

Unfortunately it is not always possible in the standardization process to apply these criteria regularly and rigidly, because members of the standardization committee and the Baraza are also guided by general, abstract principles about the ideal nature of the vocabulary which they are creating. These, sometimes contradictory, principles include consistency, transparency, precision, cultural synchronicity and intertranslatability. Consistency is an oft-stated goal as committee members call for terms to be created following particular morphological patterns. Thus committee members objected to the contraction of phrases into single words as a method for vocabulary expansion (e.g., kiuavijasumu) because no regular pattern, such as retaining only the first syllable in the word, would produce acceptable terms. In another statement of the need for consistency, MacWilliam, a researcher at the Institute of Kiswahili Research, suggests that a single Swahili morpheme be used for all occurrences of a particular Latin or Greek affix in the preparation of technical terminology (MacWilliam, 1983). MacWilliam notes that the affix iso-, for example, is rendered inconsistently in Swahili as iso, aiso, or by the Swahili word sawa 'equal'. She proposes that one of these alternatives be approved by BAKITA and used whenever translations are sought for terms containing the affix iso-. Mdee (1983) also calls for consistency in BAKITA's adaptation of loan words to the phonological system of Swahili.

Committee members also express the belief that words and terms should be transparent, that is, that the meaning of the whole should be readily deducible from the parts. This principle implies that, for most Tanzanian audiences, words and terms should be created by morphological derivation or compounding on existing Swahili roots. This principle, therefore, militates against the contraction of Swahili phrases into opaque words, or the wholesale borrowing from other languages. Vocabulary expansion by semantic extension is also not favored as it is thought that users will not be able to distinguish the "new" or technical use of a word from its common use and will, as a result, not realize when a word is used in its technical sense.

The principle of transparency, however, often contradicts another principle, precision. Members of the standardization committee and the Baraza feel that coined terms must accurately reflect the concept which they represent and be satisfactory for specialists in the field. This principle, unlike that of transparency, favors borrowing of terms, particularly from the languages in which the concepts were first learned by current practitioners (usually English). In a move towards more precise terminology, several terms based on Swahili roots which had been approved earlier and were in common use were replaced by nativized English loans. Thus, wanga 'starch' and hamirojo, formed from a contraction of hamira 'yeast' and rojo 'starchy gravy', both of which were used as equivalents for 'carbohydrate', were replaced by the nativized English loan, kabohaidreti.

In preparation of terminology for technical subjects, the goal of precision often implies the nativization of loan words, a trend which runs counter to the principle of cultural synchronicity. Tanzanians are well aware of the unifying force and symbolic significance of their national language. Elaboration of vocabulary in Swahili is seen as a patriotic

contribution to the development of the nation. In this context, therefore, it is not surprising that a number of members of the standardization committee and the Baraza as a whole stress the necessity of using Swahili roots as the basis for vocabulary expansion in order to preserve the national character of the language. At the same time, however, other Tanzanians who feel strongly the need to preserve intertranslatability in the language of science and technology, advocate the use of English or internationally recognized standard roots as a basis for vocabulary expansion, particularly in the technical registers.

The contradiction between these principles are part of the dynamics of the vocabulary expansion process and, in part, explain why rigid guidelines for the preparation of vocabulary are difficult to formulate and impossible to follow. However, a number of the contradictions could be resolved if vocabulary were prepared with specific audiences of potential users in mind. That is, while the principles of cultural synchronicity and transparency are important when formulating guidelines for the preparation of vocabulary for use in lower primary school and in adult literacy and literacy maintenance, the principles of precision and intertranslatability are more important for upper-primary school and primary teacher training. Awareness of the different needs of different audiences, and hence the use of different guidelines for preparation of vocabulary appropriate to each, would enable BAKITA to produce a more consistent, acceptable product.

Procedures for Vocabulary Expansion

While some translations of vocabulary are prepared by BAKITA employees, most are the result of a joint effort by subject area specialists, who are the users of the vocabulary, and BAKITA, via the language standardization department/committee. Subject specialists such as curriculum developers, textbook authors and teachers translate the words which they need. These words are then brought to BAKITA where they are scrutinized according to the guidelines prepared by the language standardization department. After this, the words are discussed by the language standardization committee in one of its semi-annual meetings. These meetings, which last for ten days to two weeks, are held in various regional towns. Participants include the head of the language standardization department in the role of secretary, delegates of the Baraza, as well as members of the public such as school teachers from the area in which the meeting is held. The meeting is conducted by one of the delegates who is selected by the voting members present. Although such a large and varied panel may be unwieldy, it provides public input into the vocabulary expansion process which helps standard Swahili achieve a national character, and leads to its acceptance.[7]

The process by which the words are accepted as standard Swahili is often time-consuming. Each word is discussed separately, and the concept on which it is based is elucidated. Competing words and their reasons for rejection are mentioned as are related words which have already been standardized. If specialists in the subject are present, who may be the authors of the words, they are asked to explain the concept for which the word is sought and the rationale for the proposed choice. All participants in the meeting are free to voice their objections and propose alternatives. Decisions on whether to adopt words are not usually postponed and discussion continues until a consensus is reached.

The discussion preceding the adoption of the word ngaha 'accessories' is illustrative of the procedure followed by the committee on standardization. The original word proposed by the literature department of the Institute of Kiswahili Research, who prepared the list of terms for the field of literary criticism, was visovasi, a contraction of the phrase vitu ambavyo si vazi 'things which are not clothes', with reference to theatrical properties used by actors to enhance their costumes but which are not the actual costume/clothes. Delegates objected to visovasi on the grounds that it implies 'things which are not worn', since the verb from which the noun vazi 'clothes' is derived, kuvaa, 'to wear, put on' is also the root for the last part of the phrase vasi. Delegates also recalled that there are a number of other Swahili words whose meanings could be extended to the concept of accessories: kingaja 'bracelet', vifuasi 'accessories' (accepted previously as the standard translation in the field of home economics), and ngaha 'traditional adornments'. The latter word is of Kinyaturu origin and refers to skins and body paint worn by performers at traditional drum and dance festivals (ngoma). Delegates felt that the concept of accessories in the theatre was sufficiently different from that in the area of home economics that they rejected the previously adopted word vifuasi. They also felt that kingaja, as an item of female adornment only, was too narrow in meaning and would require too much semantic extension. Finally, the word ngaha was adopted since it refers to accessories. The fact that its use is in the context of traditional performing arts, rather than modern, is symbolic of the mixture of traditional and modern cultures which characterizes contemporary Tanzania.[8]

BAKITA's Effectiveness

BAKITA disseminates its decisions through its publications and weekly radio program. The pamphlets of official translations, Tafsiri Sanifu are sent to the relevant offices in the ministries, to schools and colleges, to the publishing houses and to the bookshops for sale to the general public. It is expected that those who are using Swahili in an official capacity, either in government or education, will refer to the lists for their vocabulary needs. However, in actual fact, BAKITA's terms are not widely used. Several evaluative studies show that the terms are used most among the educated, urban, wage-earning sector while indications are that the general public may not be aware of the existence of BAKITA (Ohly, 1982; Mdee, 1980). Specialists find that the terms lack clarity and do not exist in sufficient quantities to meet their needs. On the other hand, those who communicate with Tanzanians who have little or no formal schooling find the terms to be too technical, raising the complaint that contemporary Standard Swahili is too hard. Perhaps the most faithful users of the new vocabulary are those who participate in the creation of the lists of words themselves, particularly if their purpose in preparing the words was to enable them to write textbooks which would be accepted for use in the schools.

While a certain amount of resistance to the new terms is to be expected, both from the specialist and from the layman, the form in which the new vocabulary is disseminated, as well as breakdowns in the channels of dissemination contribute to the problems which BAKITA encounters in implementing the use of their product. Simple lists of translational equivalents are not sufficient to enable most users to understand precisely

what concepts the terms label. Furthermore, since most of the lists are alphabetized according to the English equivalent, their use is limited to those with knowledge of English. The monolingual Swahili dictionary is a general dictionary and does not include most of BAKITA's terms.

Dissemination of the terms also encounters problems on the basic physical level. Although an office in a ministry may receive a copy of the official list of translations, there is no assurance that the list will reach the actual users. Most offices lack the machines and materials to reproduce the portions of the lists relevant to their activities as was originally expected. In other cases, the publications of BAKITA do not make it through the channels and thus never reach the hands of the intended users.

Perhaps the most fundamental problem which limits BAKITA's effectiveness is the view of the vocabulary expansion process which implicitly informs the organization's activities. At BAKITA lexical elaboration is seen as the adding of words to the language. Despite the fact that the words to be standardized are often brought to BAKITA by the potential users, who are specialists in the subject area, BAKITA does not conduct a "needs analysis" to determine the characteristics of the users. At the same time, although subject specialists are involved in preparing lists of Swahili equivalents for English terms, BAKITA does not require these specialists to outline the concepts and their interrelationship so that related concepts will be labeled by terms which reflect this interrelationship. Furthermore, no distinction is made between the levels of technicality at which the same subject may be handled, a difference which might be reflected in the vocabulary to be created. As a result of this approach, concepts are assigned labels without attempting to preserve their interrelationship, thereby producing inconsistencies, while terms are adopted without considering the level of technicality at which a given audience conceptualizes, producing terms which are "too hard" for general use but which appear "fuzzy" to the specialist.

One way to improve the success of BAKITA's efforts would be to adopt a model for vocabulary planning such as that proposed by Marshad for the development of Swahili technical terminology in Kenya (Marshad, 1984). According to this model, vocabulary expansion would proceed on two levels simultaneously. Terms for the more technical levels would be adapted to the sound and spelling system of Swahili (following specified guidelines for nativization) from English or from an international standard. At the less technical levels, such as primary education, where little or no knowledge of English is assumed, terms would be coined from Swahili roots, following guidelines in order to insure that the relationship of concepts would be reflected through repetition of roots and affixes. While Marshad's model could not be adopted wholesale in Tanzania, where, unlike Kenya, English is not used as the medium of instruction until secondary school level, it is offered here as an illustration of the type of refinement of the vocabulary expansion process that a model permits.

Such a model assists planners in distinguishing the purpose for which their product is used, e.g., primary school, high school, adult education, etc., and thus lets them better gauge their intended audience. The model would provide a framework for the semantic and lexicological analysis of the

relation of concepts to each other and to the terms which label them. The model also takes into consideration the needs of the society and the allocation of languages in the verbal repertoire (e.g., transitional educational bilingualism). Once such a model is formulated, guidelines can be proposed for vocabulary expansion for each audience. As experience has shown in Israel, guidelines need to be formulated both for the general vocabulary expansion process and for the specific subject area and audience at hand (Fishman and Fellman, 1977).

Until recently the lack of a clearly stated educational language policy in Tanzania made the formulation of a model for vocabulary expansion impossible. That is, without knowing when or if Swahili would be implemented as the medium of secondary education, planners did not know who the users of their terms would be. Now that the policy has been clarified and it is well known that Swahili will not be used as the medium of most post-primary education, BAKITA can focus its efforts on terms suitable for a primary school audience and for recent adult literates. Within a model of vocabulary expansion, this would involve determining, in conjunction with subject area specialists who deal with these audiences, the level of technicality as well as the concepts to be taught at this level. Guidelines for the preparation of vocabulary could then be written with the needs of these audiences in mind. Closer cooperation with individuals in education, publishing and the media who would be in a position to disseminate the terms would help to insure their exposure. The publication of monolingual subject (classified) glossaries might also be an effective means of disseminating the new vocabulary.

Vocabulary expansion efforts in Tanzania, and in the Swahili speaking world in general, would also benefit greatly from the documentation of the terminological efforts to date that would be provided by a term bank such as that which is in the pilot stages at the Institute of Kiswahili Research (Tumbo-Masabo, 1983). At present, much of the rationale used for adopting various terms resides in the memories of the employees of BAKITA. A term bank would allow for the recording of terms as well as the guidelines which motivated their adoption. At the same time, the term bank, if organized according to international classification principles as suggested by Tumbo-Masabo, would allow planners to better delimit the fields for which terms are being created. If the bank were further organized according to concepts within each field, with terms filed according to the concept each labels, competing terms could easily be compared and lexical gaps identified. Eventually it is hoped that BAKITA and/or the Institute of Kiswahili Research would use a micro-computer for storage and manipulation of the term bank.

It is unreasonable, however, to expect BAKITA to implement these suggestions on its own. The low operating budget and the low level of expertise of its academic employees seriously impede the organization's effectiveness. Without adequate support, both in terms of financing and training, BAKITA cannot command the authority with which it is legally invested. It remains to be seen whether, under the new educational language policy, BAKITA will be able to redirect vocabulary expansion in Swahili to serve the needs of those users identified by the policy. Tanzania is in the leading position in the modernization of Swahili, and there is much enthusiasm and experience at BAKITA, the Institute of Kiswahili Research,

the Department of Kiswahili at the University of Dar es Salaam, as well as among members of the general public for the expanded use of the language. The realization of Swahili's full potential depends to a large extent upon firm policy backing.

NOTES

[1] The research on which this paper is based was conducted in Dar es Salaam while I was a Research Associate in the Department of Kiswahili from August, 1983 to June, 1984. My sincere thanks are due to the employees of BAKITA who graciously welcomed me in their offices and at their meetings, as well as to the Institute for Kiswahili Research. My appreciation also extends to Z. M. Mochiwa from whose comments I have benefited immensely. The research was funded by a Fulbright Grant for Graduate Study.

[2] The label Swahili, however, masks the dialect variation which exists in the language. A number of dialects of Swahili are spoken as native languages in settlements along the coast and on the islands of Zanzibar and Pemba. Monolingual speakers of Swahili are also found in urban areas of the mainland. The majority of Swahili speakers are bilingual speakers of the language.

[3] Tanganyika was colonized by Germany from the late nineteenth century until World War I. Britain then controlled the colony until its Independence in 1960. Zanzibar remained an independent sultanate until the revolution in 1964. Later that year Tanganyika and Zanzibar merged to form the United Republic of Tanzania. In 1975 the separate governments of Zanzibar and the mainland were united under the supremacy of the political party, Chama Cha Mapinduzi.

[4] 1967 was a landmark year in the establishment of Tanzania's socialist orientation towards political, economic and social development with the publication by President Julius Nyerere of the Arusha Declaration.

[5] 'Akizungumza lugha ya Kiingereza nchini, Mwalimu alisema kuwa Kiingereza ndicho Kiswahili cha dunia na kwa sababu hiyo hakina budi kufundishwa nchini na kupewa uzito unaostahili. "Kiingereza ni Kiswahili cha Dunia. Ni makosa kukiachia Kiingereza kikafa. Kukiachia ni ujinga siyo uzalendo," alisema. Mwalimu aliwataka Watanzania kung'ang'ania Kiingereza na Kiswahili na kuongeza kwamba kitakuwa ndiyo lugha ya kufundishia katika shule za Sekondari na Vyuo vya juu kwa sababu kikiachwa kama somo la kawaida kinaweza kufa.' Mzalendo, October 28, 1984.

[6] For example, rara 'ballad' which comes from Yoruba and was adopted at the November, 1983 meeting of the language standardization committee at the suggestion of a Yoruba-speaking Nigerian graduate student in the Department of Swahili at the University of Dar es Salaam who was observing the proceedings.

[7] The November, 1983 meeting of the standardization committee had approximately 35-40 participants including delegates, employees of BAKITA and guests. The August, 1982 meeting had 20 delegates alone.

[8] These observations were made at the November, 1983 meeting of the standardization committee which was held in Iringa, Tanzania.

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YES, VIRGINIA, SYNTACTIC RECONSTRUCTION IS POSSIBLE*

Hans Henrich Hock

The feasibility of syntactic reconstruction has been doubted in a number of recent publications. In this paper I show that the theoretical arguments in favor of this negative view are dubious. The paper concludes with an empirical demonstration that syntactic reconstruction can and does yield acceptable results, provided that it is founded on the cumulative evidence of 'archaisms'. The data for this demonstration come from Romance, the verification of the approach, from Latin.

1: In recent years a number of linguists have doubted the feasibility of syntactic recon- struction; cf. e.g. Campbell & Mithun 1980, Jeffers 1976, Lightfoot 1979, 1980, et alibi, Mithun & Campbell 1982, Winter 1984. The major reasons given for these doubts are: (a) The com- parative method works well for phonology because of the regularity and built-in directionality of sound change, but fails to work for syntax because syntactic change is not regular and has no built-in directionality. Moreover, while phonological (and morphological) reconstruction can work with cognate WORDS, there are no cognate SENTENCES. For excepting frozen expressions, sentences are not inherited, but created anew by each speaker. The basis for this creation is a system of internalized rules, hypothesized to account for the surface structures of an earlier generation. And in the process of hypothesizing such rules, reinterpretation, an inherently unpredictable and non-directional process, plays a major role. (b) Typology, which has been invoked by scholars as diverse as Lehmann (1974, 1982) and Friedrich (1975, 1976, 1977), does not provide a reliable guide, since there is no need to expect systems of proto-languages to be typologically any more consistent than those of attested languages. Moreover, as I have shown elsewhere (1985), the expectation of typological consistency in proto-languages may lead different scholars to diametrically opposed conclusions, based on essentially the same data.

The second of these two arguments is well taken and will be given further support in this paper. The first, however, leaves much to be desired. For as I will demonstrate, the claimed fundamental difference between phonological and syntactic reconstruction is spurious. In addition, the general conclusion, that syntactic reconstruction is impossible, will be shown to be unacceptable.

2: Indo-Europeanists have for a long time, since at least Delbrück (1893-1900), proceeded under the assumption that syntactic reconstruction is possible. However, until recently this assumption did not come under attack, and no theoretical or methodological defense of syntactic reconstruction was considered necessary. Without such a defense, however, the claim that syntactic reconstruction is impossible cannot be meaningfully refuted. And the fact that Lehmann (1974, cf. also 1982) and Friedrich (1975, 1976, 1977) have advocated diametrically opposed recon- structions for PIE word order may be taken to confirm the view that syntactic reconstruction simply is not feasible.

3: Here as elsewhere, of course, we must be careful not to interpret scholarly disagreement as an indictment of an entire scientific approach. And an absence of theoretical or methodological statements does not necessarily signal a lack of implicit theory or methodology. In fact, the divergence between Lehmann and Friedrich has elicited in Watkins 1976 a more explicit formulation of the traditional approach to syntactic reconstruction, as being based on the comparison of syntactic PATTERNS in related languages, with preference given not to the regular patterns, but to shared ARCHAIC ABERRANCIES. For it is the latter which are more likely to preserve an earlier state. Moreover, a reconstruction which can account for the synchronically regular patterns as innovations and for the aberrant ones as archaic relics of earlier, different regularities provides a more satisfactory explanation of the facts than one which is restricted to the synchronic regularities. Reconstruction thus boils down to proposing a hypothesis which gives the best dynamic account of the various patterns encountered in related languages. [1]

4. The very usefulness of the notion 'archaism', however, is questioned by Friedrich. He rejects the notion mainly implicitly, by basing much of his reconstruction on the most prevalent patterns found in the various Indo-European languages. But in his discussion of the applicability of Kuryłowic's Fourth Law to syntactic reconstruction (1976: 213), he explicitly rejects the concept. His argument can be paraphrased as follows: How do we know that a given synchronic aberrancy is an archaism, rather than, say, an incipient or abortive innovation? It is circular to argue that a given structure X is archaic because it agrees with a reconstructed pattern Y, if that reconstruction is based on the claim that X is archaic.

We have here, then, a very serious argument against the traditional approach, an argument which has been adopted also by some of those who have claimed that syntactic reconstruction is impossible (cf. e.g. Lightfoot).

5: Problems arise also in respect to the notion 'pattern': Some linguists, notably Lehmann (but cf. e.g. also much of Friedrich's work), have characterized their approach as the reconstruction of RULES. It is not always clear whether the term 'rule' here is simply a trendy synonym for 'pattern' or whether it is understood to mean something distinct, namely the 'mechanism' which 'generates' or 'accounts for' a given pattern within a synchronic grammar. If in fact the latter is meant, then it would certainly be justified to argue that such an approach is not feasible, since rules are not handed down from one generation to another, but only utterances from which such rules are 'abstracted'.

6: Superficially, the same argument might apply also to reconstructions based on syntactic PATTERNS, since these, too, are 'abstracted' from the utterances of earlier generations. Just like sentences and rules, they are not inherited, but created anew by each speaker. The absence of cognate structures, then, makes reconstruction impossible for syntax -- unlike phonology and morphology, where cognate words furnish a basis for reconstruction. Moreover, it might be claimed, the distinction between patterns and rules is meaningless.

This argument, however, is open to doubt. First, as Hale's (1973) famous Maori example shows, a PATTERN of consonant/Ø alternation can give rise to very different RULE systems. (Cf. also Ohala's (1974) a/Ø alternations in Hindi.) There is thus a difference between patterns and rules; and patterns are more basic or primary than rules. Moreover, unlike sentences and rules, patterns are recognized, not 'created'.

Secondly, the distinction between phonology and morphology on one hand and syntax on the other is not as great as claimed. Sounds and morphemes must just as much be 'abstracted' from the

utterances of earlier generations as syntactic patterns. True, the former can be abstracted from individual words, the latter cannot; and words in some sense are more concrete and learnable than sentences. But the distinction is only one of degree. For just like sentences, words do not come with a ready-made analysis; but their phonological and morphological PATTERNING must be recognized by the child. Moreover, both in syntax and in phonology and morphology, it is only through the recognition of such patterns that the child can successfully develop an internalized grammatical rule system. And just as the child does not need to have heard all sentences to recognize the major syntactic patterns and to account for them in terms of rules, so it is not necessary to have heard all the words of the language to recognize the relevant phonological and morphological patterns and to hypothesize rule systems that account for them. Finally, just as reinterpretation and creative extension are an ever-present possibility in syntax, so they are in the lexicon, even if to a lesser degree.

7: Historical and comparative linguistic evidence and considerations support the view that the distinction between syntax on one hand and phonology and morphology on the other is not as great as claimed.

First of all, Labov's work has shown that linguistic change takes place primarily in the peer group of adolescents or adults, not in children's language acquisition. (Cf. also Bybee and Slobin 1982.) Arguments which focus on alleged differences between syntax and phonology/morphology in first language acquisition therefore are not particularly germane to historical and comparative linguistics.

Secondly, reinterpretation is found not only in syntax or in morphology (cf. (1) and (2)), but also in phonology (cf. (3)). (In fact, some linguists would go so far as to claim that all sound change results from phonological reinterpretation; cf. Andersen's (1973) notion of abductive change.)

(1) Syntactic reinterpretation:

    (a) Skt. aranye vrkāḥ   <u>iti</u>   bālakaḥ tatra na gacchati
        'forest''wolves' <u>quote</u> 'boy' 'there' 'not' 'goes'
        '(Thinking) "There are wolves in the forest", the boy does not go there'
   → 'Because there are wolves in the forest, the boy does not go there'

Hence, with reinterpretation of quotative <u>iti</u> as causal marker:

    (b) aranye vṛkāḥ iti avayaḥ tatra   gatvā   kṣīyante
        'sheep'' there''having gone''perish'
        'Because there are wolves in the forest, the sheep, having gone there, perish'

(2) Morphological reinterpretation:
    (a) Early NEngl. <u>pease (porridge hot)</u> -- a mass noun
    (b) NEngl. <u>pea</u> (sg.) : <u>pea-s</u> (pl.) -- with reinterpretation of
        [-z] as plural marker

(3) Phonological reinterpretation:
    Du. (*)<u>luft</u> > <u>luxt</u> 'air', Rom. *<u>direktate-</u> > <u>dereptate</u> 'justice', with
    acoustically-based reinterpretation of [+ grave, - velar] as [+ grave, + velar] or
    vice versa.

Moreover, just as in syntax we can trace the fate of patterns but not of individual sentences, so in morphology it is often only possible to trace the fate of a given derivational or inflectional pattern but not necessarily of words. Thus, the correlation between English and German words of the type thereby : dabei, whereby : wobei might suggest reconstructions as in (4). However, the fact that both German and English have words which are not matched (5a), or only incompletely matched (5b) by the other language should suggest that it is the pattern which is inherited and not any particular words.[2] This suspicion is confirmed when we look at the history of these structures. Words of the type thereby are found in English and German as early as the 9th century; the whereby type, on the other hand, appears to be first and quite sparingly found in late 10th/early 11th-century German (Notker, four attested forms) and 12th-century English (Hatton Gospels, one form). In both languages, the bulk of the forms is of later manufacture.

(4) Engl.   thereby   Germ. dabei   Recon. *þār-bī (?)
            whereby   wobei   *hwār-bī (?)
            therein   darin   *þār-in(ne) (?)
            wherein   worin   *hwār-in(ne) (?)

(5) (a)Engl. whereas   Germ. ------
             ------   wogegen
    (b)   where-after   wo-nach
             where-with   wo-mit

8: Also in respect to regularity and built-in directionality, the difference between syntactic and phonological or morphological change is not as great as claimed. True, sound change is overwhelmingly regular (cf. Hock 1976b for a recent defense of that claim); but as noted for instance by Miranda (comment on Jeffers 1976), that does not mean that correspondences will be regular. Other changes, such as analogy or semantically induced tabooistic distortion (as in Engl. shoot for the well-known expletive), provide an ever-present source for irregularity. In addition, some sound changes, notably metathesis and dissimilation, are notoriously irregular. (For conditions under which they may be regular, cf. Hock In Press (a, b).) -- Analogical change typically is not regular, but rule-governed changes may be as regular as sound change, cf. e.g. the German generalization of prepausal devoicing to word-final or syllable-final environment. (Hock 1976a.) -- Syntax, being eminently rule-governed, by definition commonly operates with very sweeping, regular changes, such as the English generalization of object to subject promotion in (6). Moreover, the fact that analogy and syntactic change are not as regular as sound change may actually be a help in reconstruction, since relics of an earlier stage may be preserved. Compare the English irregular plurals pence and dice which suggest that the regular pattern in dens or pies is an innovation (cf. Hock 1976b). In the area of regular sound change, however, such archaisms by definition are absent.

(6) (a) OEng. ic seo hine   he is seon   (Acc.DO → Nom.S)
               ic help him   him is holpen   (Dat."DO" remains)
               ic giefe him   him is giefen   (Dat. IO remains)
    (b) NEng. I see him   he is seen   (DO → S)
               I help him   he is helped   (ordinary DO → S)
               I give him a book he is given a book (IO → S)

The issue of built-in directionality likewise does not provide a clear-cut distinction between syntactic and other change. First of all, Vincent (1980) correctly notes that the 'grammatic-alization' of lexical items, as in (7), is generally irreversible (if we except rare opposite develop-ments like Engl. to up one's income).[3] Similarly, the common process of placing sentence clitics into

clause-second position may produce structures like (8) in original SOV languages, with AUX or finite verb in second position and the nonfinite participle clause-final (cf. Steele 1977, Hock 1982); but I am not aware of any process which would bring about such structures in original SVO languages True, directional developments like these probably constitute a small minority in syntax. But morphological change fares no better. What seems to be less commonly realized is that also most sound change has no built-in directionality. To be sure, some developments, such as palatalization seem to be irreversible as sound changes; cf (9). But the majority of processes, including assimilation, are far from having a unique directionality; cf. (10). (See also Miranda 1978.)

(7) Ital. casa, Span. casa 'house'   :   Fr. chez (prep.) 'at the house of, with'

(8) OItal. io fui al piè d'un colle giunto   'I had come to the foot of a hill'
      AUX   pple.
   OEng. her wæs Crist ahangen   'Here Christ was hanged (= crucified)'
        AUX   pple.

(9) Palatalization: k > č etc. (but no č > k etc.)

(10) Assimilation: tm   >   pm (Swiss θ ōpma = NHG atmen)
                             pp (Skt. ātman- : MIAr. dial. appan-)
                             nm (Kor. patmada > panmada)
                             mm (Aeol. Gk. kat(a)moros > kámmoros)
                             tn (late Anc. Gk. dial. Pátmos > Pátnos)
                             tt (Skt. ātman- : MIAr. dial. attan-)
                             etc.

9: The preceding discussion shows that the claimed fundamental distinction between syntax on one hand and morphology and phonology on the other does not hold. In principle, therefore, reconstruction should be as possible -- or, heaven forfend, impossible -- in syntax as it is in phonology and morphology. This is not to say that reconstruction will always be possible or uncontroversial. After all, even in Indo-European phonology, the best and longest researched area of comparative linguistics, controversies continue on such topics as the exact number and phonetic identity of the 'velars' and of the so-called laryngeals, or the phonetic, phonological, and typological characteristics of the entire obstruent system.

10: In the remainder of this paper I will demonstrate that syntactic reconstruction is possible not only IN PRINCIPLE but IN PRACTICE. Given the wide-spread scepticism about the feasibility of syntactic reconstruction, such a demonstration would certainly seem desirable, but as far as I can tell, it has not so far been undertaken. In addition, I will show that the traditional approach with its emphasis on aberrant, archaic patterns can be applied without circularity and that it yields more satisfactory results than an approach which focuses on the synchronically most regular patterns. Finally, I will show that attempts to reconstruct a typologically consistent proto-language may lead to wrong results. The data for this demonstration come from Romance word order; the verification of the method, from Latin.[4]

11: There is virtually universal agreement that in Latin, the (near-)ancestor of the Romance languages, the pragmatically unmarked order of the major constituents was SOV And as in other SOV languages, the order of auxiliary (AUX) and non-finite main verb (MV) most commonly was MV + AUX (cf. Hock 1982). Beside SOV, various other orders were possible, many of which can be explained as due to stylistic NP movement processes. In addition, a marked verb-initial pattern

existed, in which the fronted verb signaled focus on the action, stage-setting, etc. Compare the examples in (11).

(11) (a) S(O)V#   hi omnes lingua, institutis, legibus inter se differunt
                                                                          V
                    'all of these differed from each other in speech, political institutions,
                    and laws' (Bell. Gall. 1.1.2)

     (b) MV+AUX   cuius pater ... a senatu populi Romani amicus appelatus erat
                                                                    MV   AUX
                    'whose father had been called friend by the Roman senate and people'
                    (ib.1.3.5)

     (c) #V   erant omnino itinera duo
                       V
                    '(there) were only two roads' (ib.1.6.1)

     (d) Scrambl.   ea res est Helvetiis per indicium enuntiata
                              AUX   MV
                    'this matter was made known to the Helvetians through spies'
                    (ib.1.4.1)

The question arises as to whether reconstruction on the basis of modern Romance evidence can approximate this state of affairs.

11: The synchronically most productive and unmarked pattern of the Romance languages clearly is SVO, with the order AUX + MV; cf. e.g. (12). If we were to use this evidence as the basis for reconstruction, then we would fail to arrive at the unmarked SOV and MV + AUX of Latin. This approach therefore is inadequate, and we must look to the traditional, archaism-based approach for an answer.

(12) Span.   Juan   ha   robado   una   manzana
     Fr.   Jean   a   volé   une   pomme
     It.   Giovanni ha   robato   una   mela
               'John   has   stolen   an   apple'

12: In order to be acceptable, however, this approach requires a non-circular determination of what constitutes an archaism, based on independently established criteria.

One such criterion is the traditional wisdom of historical linguistics, codified in Kuryłowicz's (1947) 'Fourth Law of Analogy', that if in non-phonetic change OLDER FORMS continue to exist next to the innovated forms, they are LIMITED TO MARGINAL FUNCTIONS. Moreover, observation of attested linguistic histories shows that certain types of language use tend to best preserve such marginal forms. These conservative texts include legal documents, and traditional literary forms, such as epic poetry, popular ballads, and folk narratives.

At the same time, not all deviant patterns are necessarily archaic. Some may be mistakes, or intentional deviations (especially in non-traditional poetry), or the harbingers of a coming innovation. Such deviations however would not be be limited to conservative texts. Moreover, if such

deviations are synchronically felt to be 'old-fashioned' and if within observable history their use can be seen to be decreasing, it is more likely that we are dealing with archaisms than with, say, incipient innovations.

13: The case for considering a particular pattern an archaism becomes even stronger if we can find CUMULATIVE evidence in related languages, such that they show similar deviations, but in very different contexts, at least some of which are typical for archaisms. In that case, common innovation would be highly unlikely, and the only satisfactory historical EXPLANATION will be the hypothesis that we are dealing with common inheritance.

14: In addition to the productive pattern of (12), the Romance languages also have marginal patterns, i.e. possible archaisms. One of these is pan-Romance, although outside imperatival structures it appears to be on the retreat, especially in French where only a few frozen expressions sur- vive. This is the verb-initial pattern in (13). Disregarding the still-productive imperative structures, this pattern serves to focus on the verbal action and as a stage-setting device. Since this pattern is marginal it may possibly be an archaism, of which the predominant SVO would be a secondary replacement. However, the fact that all the Romance languages agree on the marked functions of this construction suggests that its marginality, including the markedness of its functions, is inherited from the proto-language, i.e. that in the proto-language verb-initial order coexisted and contrasted with the ancestor of the modern unmarked SVO.

This impression is reinforced by the fact that a similar distinction between verb-initial and other sentence structures is made in the case of verb + clitic pronoun sequences, at least in some of the languages; cf. (14). And the fact that in French these structures are limited to the only productive verb-initial type, the imperative, and that Italian and Spanish have a strong tendency toward a similar limitation suggests that the contrast between verb-initial and other sentence structures is an archaism, not an innovation.

(13) (a) Span. vaya con Dios   'go with God'
         Fr.   cherchez la femme   'look for the woman'
         It.   lasciate ogni speranza   'abandon all hope'
    (b) Span. fue en esta ciudad un rey ... 'there was in that city a king'
         (Fr.   suivent les noms ...   '(now) follow the names ...')
         It.   disse il professore ...   'said the professor ...'

(14) (a) Span. mostrad me   'show me' (impve.)
               verémos lo   'we will see that' (non-impve.)
         Fr.   dis-le   'tell it' (impve.)
         It.   mostrate mi   'show me' (impve.)
               disse gli la dama ...   'said the lady to him ...'(non-impve.)

vs. (b) Sp.   (yo) te amo   'I love you'
         Fr.   je t'aime   "   "   "
         It.   (io) ti amo   "   "   "

15: There is evidence also for marginal (S)OV, verb-final, or MV + AUX patterns. However, unlike the verb-initial type, these latter patterns are found in very different contexts in the various Romance languages. And these contexts include traditional (popular) poetry.

Evidence for OV is found in the so-called s̲ă̲-optative of Romanian, as in (15). It is also found in frozen, 'idiomatic' expressions like (16a). Contrast what would be the productive pattern in (16b) with VO AND article.

Verb-final patterns can be observed in Romanian and Galician folk poetry of the last century, as in (17).

A combination of verb-final and MV + AUX is frequently encountered in Sicilian and Sardinian dialects, cf. (18).

MV + AUX is found in 'frozen' form in the non-Balkan Romance future. That forms like (19a) are in fact univerbations of infinitive + 'have' is shown by the evidence of Portuguese and Sicilian, which permit a clitic pronoun to intervene; cf. (19b). Romanian uses a different auxiliary, namely the verb 'want', which may precede or follow its main verb; cf. (20a). And the same option exists for the auxiliary of the conditional; cf. (20b).

(15)   Rom.   dereptate s(ă) aveți spre tot omu-lŭ
                     O   V
              'that you may have justice for every man'

(16) (a)   Fr.   sans mot dire   'without saying a word'
                       O   V
     (b)   Fr.   sans dire un mot   "   "   "   "
                      V   O

(17)   Rom.   cu nevesta mě iubesc / după fată mě topesc
                           V   V
              'I am in love with the woman, a pine away for the girl'

(18)   Sic.   la picilidda vatiatta è ?   'has the girl been baptized?'
                       MV AUX

(19) (a)   Span.   amaré = amar + hé   'I will love'
                         inf.   have
     (b)   Port.   fazê-lo-hei   'I will do it'

(20) (a)   Rom.   voĭ cîntà / cîntà voĭ   'I will sing'

     (b)   Rom.   așĭ cîntà / cîntà așĭ   'I may, would sing'

16: What is important about these marginal patterns is that the Romance languages diverge greatly, showing no cross-the-board agreement either on the specific patterns or on the contexts in which they are used. At the same time, the patterns all point toward the same word order, namely SOV, with verb in final position, and MV + AUX.

If we reconstruct SOV as one of the orders of the proto-language, then we are able to account for these divergent patterns as archaisms, whose survival in a given language and a particular context can be a matter of accident. On the other hand, if we do not reconstruct SOV, then we will have to claim that for some strange and unexplained reason, all of these languages independently underwent innovations which, though taking place in very different contexts, 'happened' to converge in the

direction of SOV. Clearly, of these two alternatives, the former provides the better explanation and is to be preferred.

17: What remains to be settled is whether SOV should be reconstructed as an alternative to the predominant SVO of modern Romance, or in its stead. Evidence for original identity between SOV and SVO may be found in the fact that no special, cross-Romance function seems to be attached to the SOV patterns and that they are just as much in contrast with the specially marked verb-initial pattern as is the synchronically predominant SVO. Also the clitic patterns in (14) argue for an original contrast between two patterns (verb-initial and 'other'), not three (verb-initial, SVO, and SOV).[5] In view of these arguments, it seems preferable to reconstruct SOV as the original unmarked order and to consider SVO an innovation.

A possible counterargument might be that this would entail the dubious assumption that all of the Romance languages independently innovated by changing SVO to SOV. However, given that (most of) the neighboring non-Romance languages likewise have SVO and that Romance shares other features with these languages (such as a contrasting pair of definite and indefinite articles), the change of SOV to SVO may be considered a common, areal innovation.

18: The reconstructions we are left with, then, are verb-initial and SOV   And the fact that these are the two major contrasting patterns of Latin shows that the traditional approach to syntactic reconstruction, with its emphasis on the notion 'archaism', can yield results which closely approximate the (near-)ancestral language. Syntactic reconstruction, thus, IS possible. True, the evidence examined would not enable us to reconstruct the scrambling exemplified in (11d), or to determine the precise route by which SOV changed to SVO. But as noted earlier, areas of uncertainty exist even in phonological reconstruction.

19: Let me conclude with a brief glance on the relevance, or lack thereof, of typology for syntactic reconstruction. If we were to follow the typologistic approach of scholars like Lehmann and Friedrich, we would run into the difficulty that all the Romance languages have postnominal relative clauses, while 'typologically pure' SOV languages employ different strategies. To judge by these two scholars' approaches to Indo-European reconstruction, Lehmann would therefore conclude that the evidence of the Romance languages notwithstanding, the ancestral language, being SOV, must be reconstructed as having prenominal relative structures, while Friedrich would consider the postnominal relative clauses evidence against an ancestral SOV. In fact, however, the relevant chronological layer of Latin had SOV as its unmarked major constituent order, as well as post-nominal relative clauses. And given the Romance evidence, this is precisely what would be postulated by a reconstruction which does not try to impose on the ancestral language what Watkins has called the 'straight-jacket' of typology.

NOTES

[1]The argument that it is syntactic PATTERNS, rather than individual sentences, which form the basis for syntactic reconstruction is found also in Hall 1968, Gulstad 1974, and Costello 1983 But

these publications do not address the importance of archaisms and thus do not offer any means for evaluating competing reconstructions. Eckert (1978) comes closest to Watkins, by emphasizing fixed, archaic collocations as the basis for syntactic reconstruction. However, he does not elaborate on whether and how reconstruction can go beyond the individual ancestors of these collocations.

[2] This presupposes, of course, that the univerbation of earlier *bār bī etc. to OE bærbig etc., although attested only from the 9th century, began as a variable process in the ancestral language. Otherwise, the development would be even more complex, although the basic argument would remain unaffected.

[3] In this assessment, Vincent was anticipated by Miranda 1978. However, a number of the processes which Miranda cites as unidirectional are of doubtful cogency, including Givón's (1971) claims regarding Romance clitic ordering. (For these claims see also below.)

[4] Many of the Romance data are drawn from Richter 1903 and Rohlfs 1954.

[5] The fact that in (14b), the clitic object pronouns precede, rather than follow the verb might be taken as a further archaism of earlier OV order; cf. Givón 1971. This argument, however, is not cogent; for the preverbal position of object clitics can be accounted for by a different scenario; cf. Wanner 1985 and Pearce 1984.

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SYLLABLE STRUCTURE AND SUFFIXATION
IN WOLOF *

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The aim of this paper is to analyze the
phonological processes taking place in Wolof when
derivational suffixes are added to verb stems. After
a presentation of the syllable structure and the
syllabification principles of the language, the
syllable-changing rules affecting the segmental
string at the junction of stems and suffixes are
discussed: namely, gemination, degemination, glide
insertion, vowel coalescence and vowel insertion. It
will be proposed that these rules apply whenever the
syllabification principles fail to syllabify
exhaustively the segmental string. In turn,
syllabification will take place after a phonological
rule has applied. This suggests that syllable
structure is assigned at different levels of
phonological derivations.

0. Introduction.

This paper applies an autosegmental theory of the syllable
to Wolof.[1] More precisely, I will try to provide, using various
proposals regarding the syllable (Clements and Keyser 1981,
1983; Steriade 1982; Noske 1984; Selkirk 1984), an analysis of
the phonological patterns occurring in Wolof at the junction of
a verb stem and derivational suffixes.

After a brief presentation in section 1 of the underlying
represenation of Wolof syllable structure and the
syllabification principles of the language, section 2 describes
the phonological rules affecting the structure of the segmental
string when certain suffixes are added to the verb stem. It
will be shown that the effect of these rules is to change an
otherwise ill-formed syllable structure in accordance with the
syllabification priciples of the language.

1. Wolof Syllable Structure.

Before analyzing Wolof syllable structure and the syllabi-
fication priciples of the language, a short outline of the
segmental system is necessary.
The vocalic system is depicted in the following chart:

	Front	Central	Back
High	i		u
Mid-close	é	ë	ó
Mid-open	e	a	o
Low		à	

In addition to these oppositions, there is a contrast between
long and short vowels; only ë and à have no corresponding long
vowel.

The consonantal system distinguishes between simple,
geminate (also called long or strong) and prenasalized
consonants. Theses three series of consonants have different
distributions depending on their position within the stem. In
stem-initial position, the following simple consonants occur:

p	t	c	k
b	d	j	g
m	n	ñ	ṅ
f	s		x
		y	w
	r,l		

Prenasalized consonants, geminates and consonant clusters do
not appear in this position.[2] In medial and final positions in
the stem, all of the above consonants (plus the prenasalized
ones) can appear, except p, c, k, d.[3] In addition, geminates
also appear; they ordinarily alternate morphologically with
simple consonants, but the pairing of geminate and simple
consonant is not always the expected one. We find the following
alternations:

expected alternations

(1)   b ~ bb
?ub"to close" / ?ubbi "to open"
yab "to load" / yebbi "to unload"

(2)   t ~ tt
bët "eye" / bëtt "to pierce"
boot "to carry on the back" / botti "to take off the
                                     back"

(3)   j ~ jj
       tëj "to close" / tijji "to open"
       muj "end" / mujj "to be last"

(4)   g ~ gg
       teg "to put on" / teggi "to put off"
       sag "honor" / sàggi "to uncover"

(5)   w ~ ww
       xew "to be in fashion" / xewwi "to be out of fashion"
       yeew "to tie" / yewwi "to untie"

(6)   y ~ yy
       tayal "to be lazy" / tàyyi "to be tired"

(7)   l ~ ll
       lal "to lay a sheet" / làlli "to put off a sheet"
       sali "dried and salted fish" / sàlli "to lose taste"

(8)   m ~ mm
       lem "to fold" / lemmi "to unfold"
       xam "to know" / xàmmee "to recognize"

(9)   n ~ nn
       beneen "another" / benn "one"
       sën "garbage" / sànni "to throw away"

(10)   ñ ~ ññ
       saañ "to plug" / sàññi "to unplug"

(11)   ŋ ~ ŋŋ
       waŋ "lower back" / (ne)waŋŋi "to show the lower back"

unexpected alternations

(12)   f ~ pp
       sof "to join" / soppi "to disjoin, to change"
       tofo "younger sibling" / topp "to follow"
       sëf "to load" / sippi "to unload"

(13)   s ~ cc
       sos "soak" / socc "to rinse"
       fas "to tie" / fecci "to untie"
       tas "to smash" / (ne)tàcc "to be smashed"

(14)   r ~ dd
        teer "to arrive" / teddi "to depart"
        tur "name" / tudd "to be named"
        jur "to give birth" / juddu "to be born"

(15)   Ø ~ kk
        dee "to die" / dekki "to resuscitate"
        dë "doorstep" / dëkk "to live"
        jë "forehead" / jëkk "to be first"

(16)   x - qq[4]
        ñóóx "to push in" / ñuqqi "to pull out"

     In each of the above unexpected alternations, the geminate
is a stop whereas the corresponding simple consonant is a
continuant. kk, however, does not have a corresponding simple
variant in the surface: it alternates with Ø. The simple
consonants f , s , x and the corresponding geminates pp , cc ,
qq are all voiceless; however, it is difficult to make the
members of the pairs correspond in their point of
articulation: f is a labio-dental and pp a bilabial, s is an
alveolar and cc a palatal, x is a velar and qq an uvular. In
contrast, r and dd are both dental and voiced.

     At this point, a natural question arises as to the
underlying representation for these alternating pairs of simple
and geminate consonants (in medial and final positions): while
the underlying representation is straightforward in the
expected alternations (for example, in the case of ?ub ~ ?ubbi,
it is clear that a voiced labial stop is underlying) it is not
so straightforward in the case of the unexpected
alternations. Two solutions are possible: (1) consider the
continuants as underlying; (2) consider the stops as
underlying. If the first solution is adopted, we will need, in
addition to a rule (or rules) accounting for the alternation
between a simple and a geminate consonant, a rule of
"hardening" that converts a continuant to the corresponding
stop when the continuant appears in a geminate form:

(18)   /f/ ~ /ff/ $\longrightarrow$ pp
       /s/ ~ /ss/ $\longrightarrow$ cc
       /r/ ~ /rr/ $\longrightarrow$ dd
       /x/ ~ /xx/ $\longrightarrow$ qq

However, we will have to solve the problem of the source for
kk, since the corresponding element is Ø; i.e. what continuant
can underline kk? Consider the following alternations where we
have underlyingly the same morpheme in each pair:

(17) dee "to die" / dekki "to resuscitate"
      we "to connect" / wekki "to separate from"
      jë "forehead" / jëkk "to be first"

It would be difficult to derive <u>kk</u> in any plausible way directly from Ø. In the other cases, a stop would appear when a consonant appears in a geminate form. But how can we speak of Ø being "geminated" so as to produce, via hardening, <u>kk</u>? An alternative would be to posit a hypothetical consonant as underlying : the most likely candidate would be the velar continuant <u>x</u>. Unfortunately, that consonant has already an alternant <u>qq</u>. The continuant underlying the Ø ~ <u>kk</u> alternation would thus have to be an abstract one--not one of the actually occurring continuants in the language.

This first solution to the unexpected alternations would also require that the hardening of a geminate continuant to a stop be accompanied by a shift in point of articulation in some cases (e.g. when <u>ss</u> hardens it becomes the palatal <u>cc</u>). This complication concerning the point of articulation does not count as evidence against the hardening solution since the alternative solution discussed below will also require a shift in point of articulation in the same cases.

The second solution would take the underlying representation of the unexpected alternations to be a stop. Thus the basic alternation would be one involving a simple versus a geminate stop, as shown below:

     /p ~ pp/   /c ~ cc/   /d ~ dd/
     /q ~ qq/   /k ~ kk/

The geminate stops would undergo no additional rules. The simple stops <u>p</u>, <u>d</u>, <u>c</u> and <u>k</u> would have to undergo a rule of spirantization which converts them into a continuant (or zero in the case of <u>k</u>). The environment for this spirantization process would appear to be post-vocalic (since intial <u>p</u>, <u>d</u>, <u>c</u> and <u>k</u> do not undergo the rule). We will assume this environment for spirantization in the present paper, but there are a number of additional considerations that could conceivably lead in a somewhat different direction. It will be this rule of spirantization that will be responsible for the fact that the simple consonants <u>p</u>, <u>d</u>, <u>c</u> and <u>k</u> do not appear phonetically in medial or final position in the stem. Notice also that when a simple stop undergoes spirantization, there will also have to be a shift in the point of articulation (e.g. when <u>c</u> spirantizes, it becomes <u>s</u>).

We will adopt this second solution on the grounds of economy and simplicity: there is no need to posit any

underlying abstract segment to account for the Ø ~ <u>kk</u>
alternation. There are some interesting aspects to the
formulation of spirantization that we will not dwell on
here. First, notice that we run into problems if we allow <u>k</u> to
become a continuant first (along with p, <u>d</u> and <u>c</u>) and only then
delete. Why? Because if <u>k</u> becomes a continuant, it would become
the velar continuant <u>x</u> and and the <u>x</u> that actually occurs in
Wolof does <u>not</u> delete in post-vocalic position. Of course, if
we said that the actually occurring <u>x</u> is really a uvular
underlyingly (which is why it alternates with <u>qq</u> under
gemination), then we could let <u>k</u> become a continuant, delete
the resulting velar continuant in post-vocalic position, and
only then change the underlying uvular continuant to a surface
velar continuant. But barring this somewhat abstract approach
to the problem, we will have to delete <u>k</u> directly, by a rule
such as (19), and then spirantize p, <u>d</u>, and <u>c</u> by a rule such as
(2Ø). The second issue is how we are to explain why <u>p</u> and <u>c</u>
(but not <u>t</u>) spirantize and why <u>d</u> (but not <u>b</u>, <u>j</u>, and <u>g</u>)
spirantizes. It seems as though the rule should be restricted
to voiceless stops and affricates--but why is <u>t</u> not affected
(it is a voiceless stop) and why is <u>d</u> instead affected? We have
no answer to this question at the present time and simply
assume that (2Ø) will have to refer to an unnatural class of
sounds.

(19) $\begin{bmatrix} \text{-cont} \\ \text{+back} \\ \text{-voice} \end{bmatrix} \longrightarrow$ Ø   /   V ___

(2Ø)   [-cont] $\longrightarrow$ [+cont]   /   V ___

The following derivations illustrate the spirantization
processes (19) and (2Ø).

(21)   /# sop #/ "to join"
       sof   spirantization (19)

(22)   /# fac #/ "to tie"
       fas   spirantization (19)

(23)   /# teed #/ "to arrive"
       teer   spirantization (19)

(24) /# deek #/ "to die"
          dee   k - drop (2Ø)

(25) /# sopp #/ "to like"
          sopp   (19) and (2Ø) are inapplicable

(26) /# fecc #/ "to dance"
          fecc   (19) and (2Ø) are inapplicable

(27) /# tedd #/ "to live honorably"
          tedd   (19) and (2Ø) are inapplicable

(28) /# lekk #/ "to eat"
          lekk   (19) and (2Ø) are inapplicable

After this brief presentation of the segmental system,
let us turn now to the syllable structure of Wolof verb
stems. On the surface, the following syllable types are met:

   a. CV (or CVCV)   ji   "to plant"
                           fo   "to play"
                           nuyu "to greet"
                           pare "to be ready"

   b. CVV   dee   "to die"
                           woo   "to call"
                           ree   "to smile"
                           taa   "to stagnate"

   c. CVC   lem   "to fold"
                           teg   "to put on"
                           tëj   "to close"
                           yab   "to load"
                           sof   "to join"
                           fas   "to tie"
                           lal   "to lay (a sheet)"

   d. CVCC   takk   "to fasten"
                          gëmm   "to close eyes"
                          dëpp   "to invent"
                          samp   "to plant"

e. CVVC   teer "to stop (for a vehicle)"
                             suul "to bury"
                             xaar "to wait for"
                             boot "to carry on the back"

f. CVCVC   raxas "to clean"
                             xaraf "to be invited"
                             sëlëm "to wash one's face"

Following Clements and Keyser's (1981,1983) approach to
the syllable, we will distinguish three tiers in syllable
representation: the segmental tier, the syllable tier and the
CV-tier, which is intermediate between the first two. The
elements of the CV-tier divide themselves into syllable peaks
and syllable margins. A syllable peak represents any segment
dominated by a V, and a syllable margin any segment dominated
only by a C. Thus in <u>lem</u>, [e] represents the syllable peak and
[l, m] the syllable margins (respectively left and right
margin):

(29)
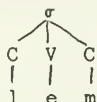
In CV terms, the syllable structure of Wolof verb stems obeys
the following syllabification principles: (1) the syllable
peak may consist of a short vowel or a long vowel: the contrast
between them is represented in terms of non-braching
vs. branching nodes on the syllable tree; (2) the syllable
right margin is an optional constituent: it may consist of zero
consonant, one consonant, a geminate or a prenasalized
consonant, but it cannot be composed of more than two
consonants (if we consider a geminate or a prenasal as
representing two consonants in the skeletal slots); (3) each
syllable begins with a consonant, hence the syllable left
margin is an obligatory constituent: it consists of only one
consonant[5]; (4) the syllable types described above show that
either the syllable peak or the syllable right margin (but not
both) may branch within the syllable, i.e. syllables of the
type CVVCC are not met in Wolof on the surface.

Taking into consideration these syllabification priciples,
it is possible to formulate an abstract syllable template
accounting for the possible syllable structures of all verb

stems at the surface level:

(30)

$$C \quad V \quad \left(\begin{Bmatrix} C \\ V \end{Bmatrix} \right) (C)$$

This syllable template can be viewed as a well-formedness condition on the syllable structure of phonological represenations in Wolof.

The stems can be combined with various derivational suffixes,[6] such as:

(31) -i "reversing"   -i   "directional"

       V   V

       -o "reciprocal"   -o   "nominalizing"

       V V   V

       -al "causative"   -al "benefactive"

       VC   VC

       -at "iterating"   -e   "transitive"

       V V C   V

       -le "participant"   -kat "agent"

       CV   CVC

The question of the underlying representation of some of these suffixes will be dealt with in section 2. In general, the combination of these suffixes with a stem is subject to the same syllabification principles as operate for the stem in isolation. There is one important difference, however. A stem syllable may end in a geminate or a prenasalized consonant when that stem syllable is word-final. But a stem syllable may not end in a geminate or prenasal when that syllable is not word final.

2.0 Phonological Rules and Syllable Structure.

When the suffixes listed in section 1 are combined with
verb stems, some phonological rules must apply, namely:

(1) gemination
(2) degemination
(3) glide insertion
(4) vowel coalescence
(5) vowel insertion

In this section, we will show that these rules apply
whenever the general syllabification principles stated in
section 1 fail to syllabify exhaustively the segmental
string. We will also give evidence that syllabification
reapplies after a phonological rule has taken place. This
implies that syllable structure is assigned at different levels
of phonological derivations before or after the application of
each phonological rule.

2.1 The gemination rule.

Consider the following alternations:

(32) ?ub "to close" / ?ubbi "to open"
     yab "to load (a vehicle)" / yebbi "to unload (a
                                        vehicle)"[7]
     tëj "to close (a door)" / tijji "to open (a door)"
     teg "to put on" / teggi "to put off"
     lem "to fold" / lemmi "to unfold"
     sof "to join" / soppi "to disjoin, to change"
     sëf "to load" / sippi "to unload"
     saf "to be tasteful" / sàppi "to loose taste"
     fas "to tie" / fecci "to untie"
     fal "to elect" / folli "to dismiss"
     lal "to lay (a sheet)" / làlli "to put off (a sheet)"
     xew "to be in fashion" / xewwi "to be out of fashion"

To explain these alternations, a rule of gemination should
be posited, which - in linear terms - lengthens (or
strengthens) a simple consonant in stem final position before
the suffix -i "reversive". It can be formulated as follows in
standard CV-phonology:

(33)   F   F
         /✗   /\
         C C $\longrightarrow$ C C   /   __]_stem   +   i
                                                            |
                                                            V

Thus, words like _lemmi_ or _soppi_ will have the following
derivations (via (33)):

```
(34)    /l e m + i/               l e  m     +i
         | | |    |      ---->     | |  /\     |
         C V C    V               C V  C C     V


(35)    /s o p  +i/                s o  p      +i
         : | |    |      ---->     | |  /\      |
         C V C    V               C V  C C      V
```

Syllabification then applies to the output of the
gemination rule, making the second C element of the geminate
the obligatory left margin to the second syllable and making
the first C element of the geminate the right margin of the
first syllable. Cf. (36) and (37):

```
(36)     l e  m    i
         | |  /\   |
         C V  C C  V
          \/   \ /
           σ    σ


(37)     s o  p    i
         | |  /\   |
         C V  C C  V
          \/   \/
           σ    σ
```

Notice that _prior_ to gemination, the syllabification principles
would make the stem-final simple consonant the left margin to
the second syllable and there would be no right margin to the
first syllable. This example demonstrates that syllabification
must follow the gemination rule in (33), since the newly
created C position must be syllabified. We will show below that
syllabification also applies to the underlying representations
as well as to the output of phonological rules.

An alternative description of gemination in Wolof would be
to analyze -_i_ "reversive" as containing an unassociated C in
underlying representation:

(38)   i
          |
          CV
          \/
          σ

When this suffix combines with a stem ending in a single
consonant, the unassociated C undergoes a rule affiliating it
to that consonant, from which it takes its features:

(39)   [t e g]   i
            | | | ~ \   \
            C V C   C' V
            \/   \/
            σ   σ

        (teggi, from : teg + Ci)
                       [reversive]

Such a process can be seen as a consequence of a general
principle under which unassociated C-elements or V-elements
trigger the automatic spreading of adjacent consonants or
vowels on the segmental string (Clements and Keyser 1983).

        Before discussing the unassociated C approach, let us
first examine the problem of the treatment of geminate
consonants in Wolof, since that treatment will play a
signifigant role in deciding between the two approaches to the
reversive suffix. Within the non-linear framework, phonological
structure is conceived of as involving seperate tiers of
represenation that are linked to each other by association
conventions: the CV tier which provides the syllable
information, and the segmental tier which provides the feature
matrixes. The units of the CV tier are called C or V slots,
whereas the units of the segmental tier are referred to as
segments:

(40) a. [F]   b. [G]   segmental tier
            | |
            V   C   CV tier

A sequence of identical segments is automatically represented
on the segemntal tier as a single element linked to two
consecutive slots on the CV tier, following the Obligatory
Contour Principle (cf. McCarthy 1979, Leben 1980, Kenstowicz
1982, Steriade 1982):

(41)　　X + Y　　　Z
　　　　|　 |　　 /\
　　　　C + C　　C C　　　(cond. : x=y=z)

　　A long consonant is defined as a segment mapped to two C slots, and a short consonant is defined as a segment linked to just a single slot. Thus, the Wolof stems <u>lem</u> "to fold", <u>saf</u> "to join", <u>takk</u> "to tie" will have the following representations:

(42)　　/l e m/　　　　/s o p/　　　　/t a k/
　　　　 | | |　　　　　 | | |　　　　　 | | \
　　　　 C V C　　　　　C V C　　　　　C V C C
　　　　　\|/　　　　　　\|/　　　　　　 \|/
　　　　　 σ　　　　　　　σ　　　　　　　 σ

The adjunction of -<u>i</u> "reversive" to these stems will give, after syllabification:

(43)　　/l e m + i/　　　　　　　　l e m + i
　　　　 | | |　　 |　 ⟶　　　　| | /\　 |
　　　　 C V C　　 V　　　　　　C V C C　 V
　　　　　　　　　　　　　　　　 \|/　 \ /
　　　　　　　　　　　　　　　　　σ　　 σ

　　　　/s o p + i/　　　　　　　　s o p + i
　　　　 | | |　　 |　 ⟶　　　　| | /\　 |
　　　　 C V C　　 V　　　　　　C V C C　 V
　　　　　　　　　　　　　　　　 \|/　 \ /
　　　　　　　　　　　　　　　　　σ　　 σ

　　　　/t a k + i/　　　　　　　 t e k + i
　　　　 | | /\ /　 ⟶　　　　　| | /\　 |
　　　　 C V C C V　　　　　　　C V C C　 V
　　　　　　　　　　　　　　　　 \|/　 \ /
　　　　　　　　　　　　　　　　　σ　　 σ

In accordance with syllabification principle 3 (SP3), the second C of the geminate becomes the left margin of the subsequent syllable.

　　The representaions above may be contrasted with those obtained after adjunction of the suffix -i "directional" to the same verb stems:

(44)   lem "to fold" / lemi "to go and fold"
       yab "to load" / yabi "to go and load"
       sof "to join" / sofi "to go and join"
       fal "to elect" / fali "to go and elect"
       takk "to tie"   / takki "to go and tie"

(45)

```
l e m  +  i            s o p  +  i
| | |     |            | | |     |
C V C     V            C V C     V
 \/   \  /              \/   \  /
 σ     σ                σ     σ
```

```
t a  k  +  i
| |  /\    |
C V C C    V
 \ |/  \  /
  σ     σ
```
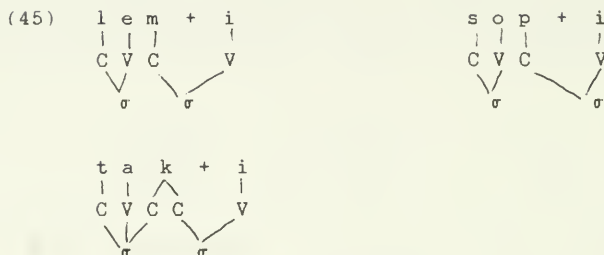
(In the case of /sop + i/, the rule of spirantization converts
the short stop to the corresponding continuant since that
simple stop is preceded by a vowel).

    With this background, let us now return to the analysis in
which the reversive and directional suffixes are treated
respectively as   i   vs.   i   : this analysis
                     | |
                     CV   V
will contrast the suffix "reversive" (which has an unassociated
C preceding the vowel i) with the suffix "directional" (which
will not contain an un associated underlying C slot) in terms
of   an underlying phonological difference. This difference in
underlying structure will produce gemination in the case of the
reversive suffix but not in the case of the directional
suffix. For example, (39) above illustrates why (in this
approach) the reversive produces gemination of a stem-final
simple consonant. (46) illustrates why the directional does not
induce gemination in a similar situation.

(46)   [t e g] i
        | | | |
        C V C   V
         \/   \ /
         σ   σ
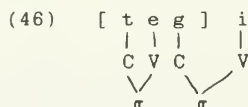
       (tegi, from: teg + i)

                    [directional]

The unassociated C analaysis for the reversive suffix works very straightforwardly for the cases where the stem ends in a simple consonant. The situation becomes a little more complex when the stem ends in a geminate or a prenasalized consonant underlying. In this case the addition of the reversive suffix and the directional suffix produces exactly the same output with respect to the stem-final consonant--namely, the vowel -i is appended directly to the stem without any change in the consonant. Thus, from takk "to tie" we get takki "to go and tie" and tekki "to untie" (notice that the reversive suffix does induce a change in the vowel of the stem in certain cases whereas the directional does not; we do not treat problems of vowel quality alternations in Wolof in this paper).

Given the analysis of the directional suffix as consisting just of a vowel on the CV-tier, there is no problem in analyzing the directional form of a stem ending in a geminate or a prenasalized consonant: the second C of the geminate or prenasal will be syllabified with the following vowel.

(47)   [g ë m]   i
            ╷ ╷ ╱╲   ╷
           C V C C   V
            ╲╷╱   ╲ ╱
             σ   σ
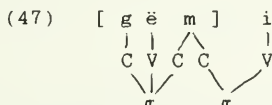
However, if we regard the reversive suffix as beginning with an unassociated C slot, some problems do arise when this suffix is added to stems ending in a geminate or a prenasalized consonant: we will obtain 3 successive C slots on the CV-tier, but in the correct phonetic output there must just be two C slots. In other words, the unassociated C position in the reversive suffix must end up unrealized in the phonetic surface.

We could perhaps achieve this effect by preventing a geminate or a prenasal consonant from spreading onto an unassociated C--this would make sense in that the language does not have triply long consonants nor does it have prenasalized geminates. If we thus block spreading of such consonants onto the empty C slot, that C will remain unassociated and thus will receive no phonetic realization.

There is, however, another pertinent fact that complicates the situation further. Namely, when a stem that ends in a geminate or a prenasalized consonant precedes a suffix that begins (overtly) with a consonant, there is a rule of vowel

insertion (cf. section 2.5 below) that must apply to convert
the CCC string to CCVC. Thus given an underlying structure
/takk+Ci/, even if we succeed in keeping the unassociated C of
the suffix from associating to the features of the stem-final
consonant, we still must explain why an epenthetic vowel does
not appear between the stem-final CC and the C-initial suffix,
as in (48) below:

(48)   * [t a k]   i   * [s a m p]   i
              | | /\   \ | | | | |
              C V C C V C V   C V C C V C V
                 \|/   \ ./   \/   \|/   \ ./   \/
                  σ   √   σ   σ   ·/   σ
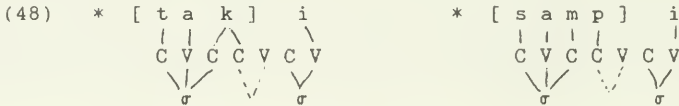
In order to prevent epenthesis here, we would have to delete
the unassociated C position prior to vowel insertion. But this
means that in effect the unassociated C slot receives no
<u>independent</u> confirmation--i.e. although it accounts for the
gemination of stem-final simple consonants, it does not behave
like a consonant in other respects (namely, in inducing vowel
epenthesis after stems ending in a geminate or a prenasal
consonant).

Another possible approach to deriving <u>tekki</u> from /takk+Ci/
exists. Suppose that we did allow the features of the
stem-final consonant to spread onto the unassociated C slot of
the reversive suffix. This would mean that the suffixal C
position would now be part of a geminate construction. We could
then try to explain the absence of epenthesis in terms of the
long-observed fact that geminates resist being split up by any
insertion processes (cf. Hayes 1984, Steriade and Schein
1984). Given a structure like (49),

(49)   [F]
                                   / | \
                                  C C C
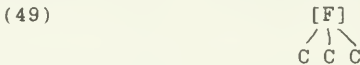
it is possible to insert a V slot and obtain

(5Ø)   [F]
                                   / | \
                                  C C V C
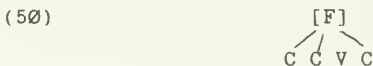
However, that inserted V slot cannot get any features; in order
for it to be associated with some set of features, the crossing
of association lines would be necessary, as (51) and (52)
illustrate:

(51)   * [F] [G]   * [G] [F]
              ⁄⁄ ⤬   ⤬ \
           C C V C   C C V C
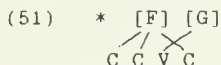
Since autosegmental phonology assumes that such a crossing of
association lines is universally prohibited, the inserted V
slot would be predicted to remain unassociated and the lack of
an overt epenthetic vowel would thus be explained in a
principled way. Of course, it is not clear exactly what
phonetic implications are made by permitting a V to remain in
the CV-tier unassociated with any features. The representaion

(52)   [f]
                          ⁄ | ⟍
                        C C V C

still is not a satisfactory one since it predicts, in effect, a
triply long consonant. In order to generate the correct surface
form, some rule will be required to delink one of the
consonants. Since there is no independantly motivated process
in the language that would take CCC to CC, this represents a
complication of the grammar that results entirely from the
assumption that the reversive has an unassociated C slot.

We have shown that the behavior of stem-final geminates
and prenasal consonants do not in any way add support to the
analysis of the reversive as having an unassociated C slot. We
will show in 2.2 below that there are two other suffixes whose
behavior is pertinent to the issues involved here and that they
do not in any way provide support for the unassociated C
analysis. We will assume in this paper that the difference
in behavior of the reversive and the directional can not be
explained in terms of an underlying phonological difference. We
will assume that both suffixes begin with a vowel and that the
rule of gemination is morphologically delimited.

2.2 The degemination rule.

We will be concerned here with two suffixes: -al
"causative" and -o "nominalizing". Consider the following data:

```
(53)  set    "to bve clean"     / setal    "to clean"
      ñuul   "to be black"      / ñuulal   "to blacken"
      rafet  "to  be beautiful"  / rafetal "to make
                                      beautiful"
      sedd   "to be could"      / seral    "to cool"
      topp   "to follow"        / tofal    "to add"
      mucc   "to be safe"       / musal    "to save"
      tëdd   "to be in bed"     / tëral    "to put in bed"
      dugg   "to come into"     / dugal    "to intoduce"
      sonn   "to be tired"      / sonal    "to tire, to bother"


(54)  topp "to follow"   / tofo  "younger sibling"
      repp "to follow his/her destiny"
                         / reefo "destiny, fate"
      sonn "to be tired" / coono "tiredness"
      baal "to celebrate, to party"
                         / mbaalo "wine"
```

A rule of degemination operates here, converting a geminate (or strong, or long) consonant in stem-final position into a simple consonant before the suffixes -al "causative" and -o "nominalizing" (with vowel-final stems, a rule of glide insertion or a rule of vowel coalescence will apply, as will be seen in 2.3. and 2.4.).

The degemination rule can be formulated as follows:

$$(55) \quad \begin{matrix} [F] \\ \diagup\diagdown \\ C\ C \end{matrix} \quad \longrightarrow \quad \begin{matrix} [F] \\ \diagup \\ C \end{matrix} \Big/ \underline{\quad}\Big]_{stem} + \left\{ \begin{matrix} al \\ [\text{causative}] \\ o \\ [\text{nominalizing}] \end{matrix} \right\}$$

Subsequently, the spirantization rule will convert a simple stop to the corresponding continuant after a vowel.

Thus, words likle _sonal_, _tofal_ will be derived as follows:

```
(56)      /s o  n  +  a l/
           |  |  /\      |  |
           C V C C    V C
```

```
s o n  +  a l          degemination
| | |      | |
C V C      V C

s o n  +  a l          syllabification
| | |      | |
C V C      V C
 \/      \ /
  σ        σ
```
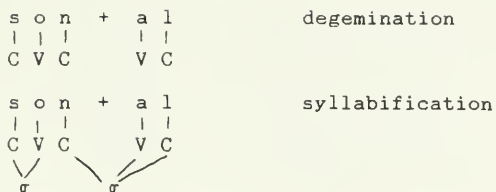
According to the syllabification principles of the language,
each syllable peak is provided a left margin, since it is an
obligatory constituent of the syllable; an optional C at the
right of a peak is syllabified with that peak and becomes the
right margin of the syllable.

```
(57)    / t o p  +  o /
          | | /\    |
          C V C C   V

        t o p  +  o          degemination
        | | |     |
        C V C     V


        t o f  +  o          spirantization
        / | \     |
        C V C     V


        t o f  +  o          syllabification
        | | \     |
        C V C     V
         \/   \ /
          σ     σ
```
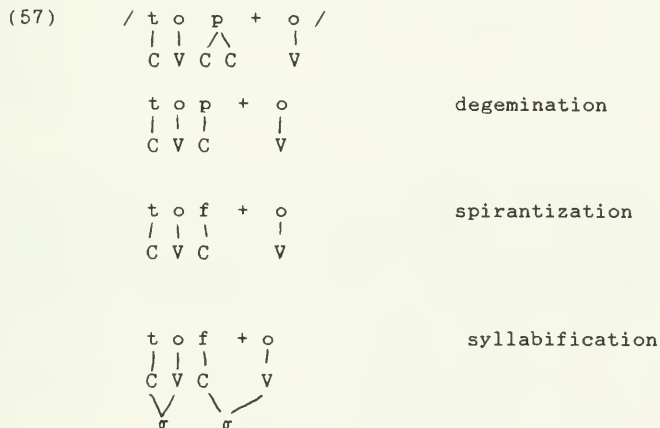
Note here that syllabification could also precede
spirantization: in each case, we will get the right result.

   The representaions involving -al "causative" may be
contrasted with those for -al "benefactive": when the latter is
combined with a verb stem, no phonological rule applies:

```
(58)    ñaan  "to pray"       / ñaanal  "to pray for"
        bey   "to cultivate"  / beyal   "to cultivate for"
        jënd  "to buy"        / jëndal  "to buy for"
        dugg  "to enter"      / duggal  "to enter for"
        topp  "to follow"     / toppal  "to follow for"
        mucc  "to be safe"    / muccal  "to be safe for"
        sonn  "to be tired"   / sonnal  "to be tired for"
```

An alternative to the preceding analysis involving a morphologically-restricted degemination rule would be to posit an unassociated C position before the causative and nominalizing suffixes but not before the benefactive suffix. For example, the causative would be represented as in (59) below.

```
(59)                    a   l
                        |   |
                    C   V   C
                     \ /
                      σ
```
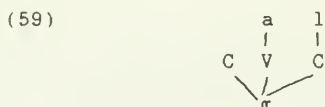
Such an alternative would be initially motivated by the fact that in many languages degemination occurs before a C. Unfortunately, it is not the case in Wolof: we should get vowel insertion in this particular enviroment (cf. 2.5.), but we do not. Furthermore, we would expect all single Cs in stem-final position to be realized as geminates before the causative and nominalizing suffixes, but this is not the case (cf. setal, ñuulal). Therefore, this analysis would not account for the data and must be rejected. Thus we see that for the suffixes that cause degemination, a morphological solution must be accepted and a phonological solution involving an unassociated C slot rejected. This does not, of course, mean that a similar morphological solution for the gemination rule discussed in section 2.1 is necessary, but it does suggest that both gemination and degemination may be alike in having been morphologized.

2.3. The glide insertion rule.

The glide insertion rule is illustrated by the following examples:

```
(6Ø)    ji  "to plant" / jiwaat "to plant again"
            (-aat "iterative")
```

.

(61)   nuyu "to greet" / nuyuwaat "to greet again"

(62)   woo   "to call"   / woowal   "to call for someone"
        (-al "benefactive")

(63)   soppi "to change" / soppiwaat "to change again"

(64)   ji "to plant" / jiyi "to go and plant"
        (-i "directional")

(65)   woo "to call" / wooyi   "to go and call"

(66)   fo "to play" / foye "to play with"
        (-e "instrumental")

(67)   woo "to call" / wooye "to call from"
        (-e "locative").

A glide is inserted between (a) a vowel-final stem and a long
vowel-initial suffix and (b) an open monosyllable stem and a
vowel-initial suffix. The quality of the glide is determined by
the following vowel. We will ignore here the issue of the
precise mechanism by which the inserted glide consonant gets
assigned its specification on the front/back dimension. The
rule of glide insertion will be as in (68):

(68)   ∅ → C   /   V ⌉   ___   V V
              | /   ⌋
           glide   /   stem
                   /   ⌈   ⌉
                  / | Co V (V) | __ V
                        ⌊   ⌋
                             stem
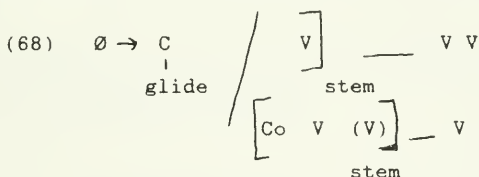
    The derivations below illustrate the rule:

(69)   / j i +   a t /
              | | /\ |
              C V   V V C

```
j i   w   a   t          glide insertion
| |   |  /\  |
C V   C V V C
```

```
j i   w   a   t          syllabification
| |   |  /\  |
C V   C V V C
 \/     \|/
  σ      σ
```

(7Ø)   / w   o   +   a l /
         | /\   / /
         C V V   V C

```
w   o   w a  l            glide insertion
|  /\  | | |
C V V  C V C
```

```
w   o   w a  l            syllabification
|  /\  | | |
C V V  C V C
 \/     \|/
  σ      σ
```

(71)   / f   o   +   e /
          | | |
          C   V   V

```
f o y e                  glide insertion
| | | |
C V C V
```

```
f o y e                  syllabification
| | | |
C V C V
 \/  \/
 σ    σ
```

The glide insertion rule can be conceived of as a hiatus breaking rule; it provides a left margin for peaks in

syllable-initial position since the Wolof syllable template rules out syllable-initial peaks.

As we have seen, glide insertion applies in specific enviroments, either between a vowel-final stem and a long vowel-initial suffix or an open monosyllabic stem and a vowel-initial suffix. In all other cases of vowel juxtaposition, a vowel coalescence rule should apply, as will be seen in the next section. Crucially, this implies that glide insertion should be ordered before vowel coalescence in Wolof.

2.3. The vowel coalescence rule.

Consider the following data:

(72)   nuyu "to greet" + -e "instrumental" :
        nuyóó "to greet with"
(73)   pare "to be ready" + -al "benefactive" :
        pareel "to be ready for someone"

(74)   tijji "to open" + -e "instrumental" :
        tijjéé "to open with"

(75)   saaga "to insult" + -al "causative" :
        saagaal "to cause to insult"

(76)   songoo "to attack each other" + -al "causative":
        songool "to cause to attack each other".

A coalescence rule operates here, collapsing the final vowel of a polysyllable stem and the initial short vowel of a suffix; it can be formulated as follows:

(77)   [α hi] _ _ _ _ _ _ _ _ [-hi]
        $\{$αbk / βrd / ϒATR$\}$ $\{$δbk / ɛrd / θ ATR$\}$
        | +
        V   V

        i.e. the resulting representation will be:

(78)
$$\begin{bmatrix} -hi \end{bmatrix}$$
$$\left\{ \alpha bk \: / \: \beta rd \: / \: \gamma ATR \right\}$$

```
        V       V
```

The derivations below illustrate the coalescence rule:

(79)   / n u y u   +   e /
```
          |  |  |  (       |
          C  V  C  V       V
```

```
          n  u  y  o                    coalescence
          |  |  |  /\
          C  V  C  V  V
```

```
          n  u  y  o                    syllabification
          |  |  |  /\
          C  V  C  V  V
           \/    \/
           σ      σ
```

(80)   / p a r e   +   a l /
```
          |  |  |  |       |  |
          C  V  C  V       V  C
```

```
          p  a  r  e  l                 coalescence
          |  |  \  /\  |
          C  V  C  V  V  C
```

```
          p  a  r  e  l                 syllabification
          |  |  \  /\  |
          C  V  C  V  V  C
           \/    \/
           σ      σ
```

The coalescence rule can be motivated by the syllabification
principle 1 (SP₁) of Wolof: only a long or short vowel may
occupy the peak position. Sequences of nonidentical vowels are
ruled out by this rule, which in effect prohibits them from
being dominated by one syllable node. Given that a syllable
cannot begin with a vowel, a sequence of two nonidentical

vowels can neither be in the same syllable nor in different syllables. We seen then that vowel coalescence and glide insertion play a similar role in resolving a situation where a vowel sequence cannot be syllabified. Vowel insertion resolves the problem by providing the second vowel with an onset so that this vowel can be syllabified. Vowel coalescence takes two nonidentical vowels and makes them into a long vowel, thus rendering the second vowel capable of being put in the same syllable as the first vowel.

2.5. The vowel insertion rules.

There exist two types of vowel insertion rules in Wolof: (1) schwa insertion; (2) vowel epenthesis. While schwa insertion applies between a stem and a suffix, vowel epenthesis operates within a monosyllablic stem.

2.5.1. Schwa Insertion.

Consider the following forms:

(81) làkk "to speak a foreign language" /
làkk[ë]kat[8] "speaker of a foreign language"
(-kat "agent")

togg "to cook" / togg[ë]kat "cook".

The rule of schwa insertion applies in Wolof between a stem ending with a geminate or a prenasalized consonant and a suffix beginning with a consonant. In autosegmental terms, if after syllabification has taken place in the underlying representation a consonant is not part of a syllable, schwa insertion will operate and place a schwa after the unsyllabified consonant. Resyllabification will then apply to yield the appropriate syllable structure.

This rule of schwa insertion can be formulated as follows:

(82) $\emptyset \rightarrow V \Big/ C \underline{\quad\quad}$

ë   σ

The derivations below illustrate the application of (82).

(83)   / l à k + k a t /
            | | /\ | | |
            C V C C   C V C

            l à k + k a t   syllabification 1
            | | /\   \ | |
            C V C C   C V C
              \/   \/
              σ   σ

            l à k ë k a t   schwa insertion
            | \ /\ | | | |
            C V C C V   C V C
              \/   \/
              σ   σ

            l à k ë k a t   syllabification 2
            | \ /\ | | | |
            C V C C V C V C
              \/   \/   \/
              σ   σ   σ

After   syllabification 1, the   second   member of the geminate
remains unassociated. The effect of schwa insertion is to make

possible the construction of a CV syllable out of the inserted
vowel and the preceding unassociated consonant.

2.5.2. Vowel Epenthesis.

    We saw earlier that stem syllables may end in a geminate
or a prenasal when the stem is word-final. There are also some
stems that underlyingly end in a consonant cluster that is not
a geminate or a prenasal. When these consonant clusters appear
in word-final position, the second member of the cluster is
unable to be syllabified. A vowel is then inserted in front of
that unsyllabified consonant; this vowel has the same quality
as the preceding vowel.

    The rule has the following form:

(84)   Ø → V/ V C ___ C##

(85) provides examples of the application of this rule:

(85)   /# xarf #/
         xarfal "to initiate" (-al "causative")
         xaraf "to be initiated"

(86)   /# sarx #/
         sarxal "to donate to someone" (-al "benefactive")
         sarax "to donate"

(87)   /# sëlm #/
         sëlmu "to wash his/her own face" (-u "reflexive")
         sëlëm "to wash someone's face"

We obtain the following derivations:

(88)   /# x a r f #/
             | | | |
             C V C C

             x a r f   syllabification 1
             | | | |
             C V C C
              __/
               σ

             x a r a f   vowel epenthesis
             | | | | |
             C V C V C

             x a r a f   syllabification 2
             | | | | |
             C V C V C
              \/   _/
              σ   σ

(89)   /# s ë l m #/
            | | | |
            C V C C

          s ë l m   syllabification 1
          | | | |
          C V C C
           \ | /
            σ

          s ë l ë m   vowel epenthesis
          | | | | |
          C V C V C

          s ë l ë m   syllabification 2
          | | \ | |
          C V C V C
           \ /   \ | /
            σ   σ

The epenthesis rule plays the role of a cluster breaker; it allows an unassociated consonant to be syllabified.

3. Conclusion

This paper demonstrates the importance of a multilinear view of phonological structure for lexical derivation in Wolof. In particular, Wolof confirms the general notion that a variety of phonological processes are best explained if they are seen as being caused by the failure of certain CV elements to be syllabified after the syllabification priciples of the language have applied to the underlying representation; phonological rules such as vowel coalescence, glide insertion and vowel insertion change the CV structure in such a way that the previously unsyllabified CV elements can now be syllabified. The paper provides evidence that syllabification does not take place only in the underlying representation in Wolof: it can both precede and follow the application of phonological rules. While other facets of the multilinear approach to phonology may possibly be invoked (for example, unassociated C slots, the Obligatory Contour Principle) to explain aspects of Wolof phonology, the evidence for these is not as yet entirely convincing.

Notes

* This paper has profited a great deal from extensive discussions with Charles W. Kisseberth. We are also indebted to Michael J. Kenstowicz and Diana B. Archangeli for their comments and suggestions on earlier versions of this paper.

[1] The Wolof language is spoken in West Africa, mainly in Senegal and the Gambia (now Senegambia); it belongs to the Northern West Atlantic subgroup of the Niger-Congo family, along with Pulaar (or Fulani) and Seereer (cf. Greenberg 1963).

[2] Diachronically, the voiceless prenasals are analyzed as having lost their initial nasal segment in that position:

```
mp-      p-
nt-      t-
nc-      c-
nk-      k-
nq-      q-
```

[3] p, c, k, d appear in these positions only in borrowed or derived words.

[4] In the orthography of Wolof, qq is simplified into q.

[5] Cluster-initial words are ruled out by epenthesis or prothesis; this is clear particularly in the borrowings from French:

```
classe      kalaas
statue      estati
gris        giri
sport       espoor
```

[6] There are 40 derivational suffixes, but no derivational prefixes in modern Wolof (cf. Ka 1981); we list here only those relevant to our concerns here.

[7] A subsequent rule changes the nature of the stem vowel in the following way:
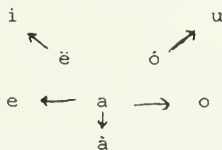
[8] The inserted vowel ë is not noted in the orthography of the language.

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APPLIED LINGUISTICS AND FOREIGN LANGUAGE TEACHING:
A NON-WESTERN PERSPECTIVE

Yamuna Kachru

In this paper, several issues have been raised with respect
to standard paradigms of research in second language acquisition
from the perspective of multilingual societies of the non-Western
world. Data from institutionalized varieties of English have
been brought to bear upon explanations in terms of interlanguage
and fossilization. It has been argued that if discourse considerations
are responsible for the non-nativeness of institutionalized varieties,
as has been claimed in several recent studies, the non-native
features can hardly be characterized as 'errors' and explained
away as due to fossilization, overgeneralization, ignorance of
rule restriction, etc. A number of questions have also been raised
about the so-called 'approaches' to, or methodologies of, language
teaching currently in favor on both sides of the Atlantic. It
has been demonstrated that second language acquisition research
needs to take into account the research findings of sociolinguistics
in language and social identity, and bi-/multilingualism. Similarly,
the research in teaching methodologies needs to be sensitive to
the wider context of language teaching. Unless the data base
of research in these areas is expanded, the claims to universality
of research findings in second language acquisition and language
teaching methodologies will remain suspect for most of the non-
Western world.

Introduction
The field of foreign and/or second language teaching is so vast
that it may be useful, at the outset, to indicate the exact context
of my discussion. First, I will not make any distinction between foreign
and second language teaching: This distinction is not very clear-
cut from the perspective of a majority of non-Western countries. I
will return to this point later. Secondly, as the issues arise, I
will refer to second language acquisition, second language learning,
and second language teaching, as all three are related in the context
of language education.' Thirdly, I will confine myself to posing some
questions for applied linguistics and language teaching. I am particularly
concerned with the theoretical framework in second language acquisition
research, and the methodology of second language teaching.

Second vs. Foreign Language
First, let me address the question of second vs. foreign language.
It is true that historically speaking, for example, English and French
are foreign languages in several parts of the world where they were
introduced by the colonial powers. The countries where these two
languages are used in the present post-colonial era are referred to
as Anglophone and Francophone, respectively. In these nations, English

and French are no longer foreign languages, they are used intranationally
for purposes such as administration, education, and legal services.
Hence, they are the most prominent second languages in these countries.
Nations where English has become a prominent second language are listed
in 1 below.

(1) Non-English mother tongue countries where English has official
     status:

Botswana	Nauru
Burma	Nigeria
Camroon	Pakistan
Ethiopia	Philippines
Fiji	Sierra Leone
Gambia	Singapore
Ghana	*South Africa
India	Sri Lanka
Israel	Sudan
Kenya	Swaziland
Lesotho	Tanzania
Liberia	Tonga
Malawi	Uganda
Malaysia	Western Samoa
Malta	Zambia
Mauritius	Zimbabwe
Namibia	

(Fishman, Cooper and Conrad 1977:10,12)

(*The language situation is quite complex in South Africa,
but is not relevant to our discussion.)

What is true of English in the above countries is true of French
in the Francophone countries of Africa. In the following countries
of Africa, French is the medium of education and hence, of administration,
etc.

(2) Former French colonies where French is the medium of education:

Algeria	Mali
Benin	Mauritania
Burundi	Morocco
Central African Republic	Niger
Chad	Rwanda
Congo	Senegal
Djibouti	Togo
Gabon	Tunisia
Guinea	United Rep. of Cameroon
Ivory Coast	Upper Volta
Madagascar	Zaire

(Bokamba 1984)

What is true of English and French in the countries listed in
1 and 2 above is true of Spanish and Portuguese in Latin America.
Since I am most familiar with the Anglophone parts of the world, my
subsequent discussion will focus on English in non-native contexts.
I will particularly concentrate on English as a Second Language (ESL)
as a representative case of second/foreign language teaching. This
is perfectly justifiable on the grounds that a great deal of research
in the area of Second Language Acquisition (SLA) is devoted to ESL
all over the world.

SLA Research: The State of the Art
    As regards the paradigms of research in the field of second language
acquisition, this area has been approached from four major standpoints
in the past three decades. The first approach took the position that
one's first or native language either helps or hinders one in learning
a subsequent language. Therefore, a careful comparison of the structures
of the native and target languages is essential for effective language
teaching. This approach, known as the CONTRASTIVE ANALYSIS HYPOTHESIS,
was advocated by such well-known linguists and language educators as
Charles Fries and Robert Lado (Fries 1945 and Lado 1957). A number
of contrastive analyses of well-known languages appeared and it was
taken for granted that materials based on them would lead to better
success in language learning. Good examples of such contrastive analyses
are the works published by the University of Chicago Press on Spanish-
English (Stockwell and Bowen 1965 and Stockwell, Bowen, and Martin
1965), German-English (Moulton 1962 and Kufner 1962) and Italian-English
(Agard and Di Pietro 1965, 2 vols.) The bibliographies published by
the Center for Applied Linguistics list several contrastive studies
involving almost all major languages of the world (e.g., Gage 1961,
Hammer and Rice 1965; see also Dechert, Brüggemeier and Fütterer 1984).

    Soon, however, disillusionment set in and experienced language
teachers as well as researchers began to point out that contrastive
analysis had limited predictive value. It was argued that simply on
the basis of a comparison of the native and target languages, teachers
will not be able to identify what causes most difficulty in learning
the various sounds, words, and sentence patterns of a given target
language. The errors that the learners make are not always what contrastive
analysis predicts: It is not always the case that the errors made
by the learners have their source in their native languages (e.g.,
Lee 1968, Duškova 1969). Researchers also pointed out that some of
the errors learners make are similar to, or even identical with, the
errors made by children learning the target language as their first
language (e.g., Ravem 1968 and 1974). Emphasis thereafter naturally
shifted to the learner errors. Studies by Corder (1967 and 1971),
Dulay and Burt (1974) and others pointed out that systematic errors
provide clues to the progress that learners make in their learning
task. Hence, ERROR ANALYSIS is more relevant as compared to contrastive
analysis as the paradigm of research in second language learning (e.g.,
Dulay and Burt 1974).

    The emphasis on learner-centered approaches soon resulted in a
more comprehensive framework for studying second language learning

or acquisition. The new approach incorporated the techniques of con-
trastive analysis and error analysis and became known as the INTERLANGUAGE
HYPOTHESIS (Selinker 1972). This hypothesis stipulated that systematic
learner errors provide clues to the process of learning. A periodic
study of such errors, and a comparison of learner performance in the
target language with the native and target language systems, will identify
the successive stages of learning. At each stage, learners have an
interlanguage system that is different from their native as well as
the target language system that they are attempting to acquire. A
learner progresses through several stages of interlanguage before acquiring
competence in the target language. In a majority of cases of adult
learners,native-like competence in the target language is difficult
to achieve. Even at the most advanced stages of the interlanguage,
adult learners have traces of fossilization of their native language,
or of an interlanguage, features in their target language system.
The interlanguage hypothesis, incorporating the insights of earlier
approaches and concepts such as fossilization, is by now well-established.[2]

The interlanguage hypothesis represents a general acceptance of
the assumption that second language learning is similar to first language
acquisition (Dulay and Burt 1976). This in turn has led to investigations
of learner errors in terms of language universals. It is claimed that
an explanation for errors in learner performance can be found if it
could be established that it is the marked structures of the target
language that cause learning problems (Eckman 1977). An example of
this phenomenon is the following: Relative clause formation in English
is marked in the sense that it involves, in addition to the use of
appropriate relative pronouns, the fronting of the relative pronoun
and hence a change in word order within the relative clause. For instance,
in the sentence I would like to see the book which you recently bought,
the relative pronoun which is understood as referring to the object
of the verb buy, and yet the word order is not you bought which. As
a consequence of the front shifting of the relative pronoun, the structure
becomes complex and difficult to acquire from the point of view of
a learner. As this hypothesis is attractive to researchers interested
in linguistic universals, it has been adopted by a number of them.

Recent Trends in SLA Research
This emphasis on linguistic structure to explain language learning
was not acceptable to all. A number of researchers proceeded to demon-
strate that language learning and teaching do not involve language
structure only. Rather, successful language learning involves competence
in communicating one's ideas, beliefs, needs, etc., in various types
of linguistic interactions.

The activities of the Council of Europe dealing with the problem
of teaching European languages to immigrant workers in Western Europe
and Britain ultimately resulted in the development of a new approach
labelled COMMUNICATIVE LANGUAGE TEACHING. According to this approach,
what language teaching and learning have to deal with is the use of
language in social interactions rather than a mere mastery of the
skills of pronunciation, grammatical structures, vocabulary, etc.
The main issue in teaching is how to equip the learners with the capa-
bility to use the target language appropriately in various social situations
to achieve their communicative goals. This approach and related methodology

were first proposed in Wilkins (1976) and later elaborated in Munby (1978). By now, the communicative approach to language teaching has gained wide acceptance on both sides of the Atlantic.[3] It should, however, be noted here that the underlying theoretical and methodological insights for these approaches were provided by linguists and sociolinguists such as J. R. Firth, Dell Hymes, and M. A. K. Halliday.

SLA: A Non-Western Perspective

Approaching second language teaching and learning from a non-Western perspective opens up a whole new range of issues not normally addressed in the approaches discussed above. The issues of literacy and language in education are inextricably tied in with the issue of language teaching and learning in those areas of the world where English, French, Portuguese, and Spanish are the media of education without necessarily being the native languages. In Ivory Coast, Kenya, Singapore, and South Asia, to name just a few nations, it is not a question of teaching French or English as a second language, but a question of teaching literacy skills, mathematics, sciences, history, etc., through French or English. Thus, the whole issue of teaching a second language is linked with questions of language policy and planning. (See ARAL 4, 1983 for a discussion of literacy in several regions of the world, and Rubin and Jernudd 1975 and Cobarrubias and Fishman 1983 for questions of language policy and planning in developed and developing countries.)

It is worth noting that in a majority of the nations of the non-Western world (e.g., the ones listed in 1 and 2 above), it is not a question of 'bilingualism[4] or not' (Skutnaab-Kangas 1984), as is clear from the data in 3 below.[4]

(3) Language profile of selected countries of the non-Western world:

    a. India: Number of mother tongues reported in the census: 1652. These belong to four language families: Indo-Aryan, Dravidian, Austro-Asiatic, and Sino-Tibetan. Official languages: Hindi and English. Media of higher education: sixteen major languages and English.

      Kenya: Four major languages: Swahili, Gikuyu, Lubya (Bantu family), and Luo (Nilotic family). Official languages: Swahili and English. Medium of higher education: English

      Singapore: Three major ethnic groups: Chinese, Malay, and Tamil. Languages: Several Chinese dialects, Malay, and Tamil. Official languages: Mandarin, Malay, Tamil, and English. Medium of higher education: English.

It is clear from the above that a majority of the population in these countries is bi-/multilingual and has been for centuries. Thus, concerns of bi-/multilingualism are extremely relevant for research on second language acquisition from the point of view of these countries.

The Case of Non-Native Varieties of English
    I would like to elaborate on these concerns with one example.
The case in point is that of English around the world. In many of
the countries where English is used either as an official language,
as a language of higher education, or for international trade and commerce,
diplomacy, etc., varieties of English have developed which are not
identical with the native varieties used in Australia, Britain, Canada,
New Zealand and the United States of America (see Bailey and Görlach
1982, B. Kachru 1982, 1983, Platt, Weber and Ho 1984, Smith 1983, among
others, for details regarding these varieties). In some of these varieties
there is a considerable body of creative literature. The perceptions
of some of the users of these varieties is given in 4 below.

   (4)a. Most Singaporeans recognize the fact that they speak English
          differently from the so-called "native speakers" of English.
          ... They accept these differences but are quite content
          to speak English their "own" way as long as they can be understood
          by fellow-Singaporeans and foreigners.
                               (Richards and Tay 1981:54)

      b. I feel that the English language will be able to carry the
          weight of my African experience. But it will have to be
          a new English, still in communion with its ancestral home
          but altered to suit its new African surroundings.
                               (Achebe 1965:30)

      c. I am an Indian, very brown, born in
          Malabar, I speak three languages, write in
          Two, dream in one. Don't write in English, they said,
          English is not your mother-tongue. Why not leave
          Me alone, critics, friends, visiting cousins,
          Everyone of you? Why not let me speak in
          Any language I like? The language I speak
          Becomes mine, its distortions, its queernesses,
          All mine, mine alone. It is half English, half
          Indian, funny perhaps, but it is honest,
          It is as human as I am human, don't
          You see? It voices my joys, my longings, my
          Hopes, and it is useful to me as cawing
          Is to crows or roaring to lions, it
          Is human speech, the speech of the mind that is
          Here and not there, a mind that sees and hears and
          Is aware. Not the deep, blind speech
          of trees in storm or of monsoon clouds or of rain or the
          Incoherent mutterings of the blazing
          Funeral pyre. ...
                               (Das 1980:38-39)

    Some of the linguistic features that make these non-native varieties
different from the native varieties of English are given in 5 below.
(See B. Kachru 1982, Platt, Weber and Ho 1984, Smith 1981, among others,
for details).

(5) Phonology:
     Different stress placement in words (the syllable preceding '
     is stressed):

a. Filipino: laborato'ry, chara'cterized, circu'mstances
b. Singaporean: facu'lty, educa'ted, conte'xt, prefere'nce
c. Indian: de've1opment, chara'cter
d. Nigerian: su'ccess, recogni'ze, investiga'te
                                    (Lowenberg 1984b)

     Lexicon:

a. Singaporean: Handicaps on our island republic get stares
                wherever they go.
                                    (Lowenberg 1984b)
b. Indian: What are the subjects you offered at B.A.?
                                    (Lowenberg 1984b)
c. Ghanian: He does not use a chewing stick to clean his teeth.
                                    (Lowenberg 1984b)
d. East African: He overlistened to the boy's conversation.
                                    (Hancock and Angogo 1982:318)

     Syntax:

A. Countability of non-count nouns:

a. Filipino: He has many luggages. (Gonzales 1983)
b. Singaporean: Give me a chalk. (Lowenberg 1984b)
c. Nigerian: I lost all my furnitures and many valuable properties.
                                    (Bokamba 1982:82)
d. Indian: There are historical as well as synchronic evidences
           which can support separating of aspiration from stops.
                                    (IL 35:3, 1976:230) [5]

B. Resumptive pronouns:

a. Arab: the time I spent it in practice
b. Chinese: We put them in boxes we call them rice boxes.
                                    (Schachter 1976)
c. Nigerian: The politicians and their supporters, they don't
             often listen to advice.
                                    (Bamgbose 1982:106)

C. Tenses:

a. Singaporean: Are you feeling lonely, bored or having no time
                to get friends?
                                    (SM July 7, 1984:5)
b. Indian: You are all knowing, friends, what sweetness is in
           Miss Pushpa.
                                    (Ezekiel 1976)

Interlanguage or bilingual's creativity?
     The above examples and similar data from non-native varieties
of English give rise to several questions. The first question is

whether the differences observable in the data are due to overgenerali-
zation of target language features or transfer from the native languages.
The difficulty is that this question is not easy to answer. To take
one example, there is no consistent semantic basis for marking the
count/non-count distinction in English nouns, especially in the case
of collective and abstract nouns. In such cases, learners simply follow
the conventions of their own native languages (cf. examples in A above).
Similarly, in the case of resumptive pronouns (cf. examples in B above),
Schachter and Celce-Murcia (1980) argue that such structures in the
performance of Chinese and Japanese learners are motivated by the topic-
comment structure of their native languages. Hatch (1978b) claims
the same about the use of articles (a, an, and the) in the English
of Spanish speakers. In Hatch (1978b), it has been pointed out that
an analysis of total texts produced by Spanish speakers reveals the
fact that these learners follow the Spanish convention of use of indefinite
and definite articles in their English. This learner strategy leads
to fewer errors in the use of the, but a greater number of errors in
the use of a/an.

The following examples from various localized forms of English
provide further support for the claim that learners follow the discourse
conventions of their native languages which results in their using
specific grammatical devices of English in a non-native fashion.[6]

    Discourse:

a. Indian:
    ... The position has belonged to such actresses who come to
    personify, at any given moment, the popular ideal of physical
    beauty ...

                        (IT, September 30, 1983:39)

    ... They are brought up in such an atmosphere where they
    are not encouraged to express themselves upon such subjects
    in front of others ...

                  (HLI: 194-195)

The use of such as a correlative of who and where in the above
examples reflects the conventions of use of cohesive ties (Halliday
and Hasan 1976) in Indian languages such as Bengali, Hindi, Marathi,
Punjabi, and others.

This leads to a further question: if the features identified
as unique to non-native varieties of English are motivated by discourse
considerations, as has been demonstrated in studies such as Chishimba
(1983), B. Kachru (1982, 1983, 1984), Y. Kachru (1982, 1983, 1984),
Lowenberg (1984a), Magura (1984), among others, then how can they
be considered instances of fossilization? How can we distinguish cases
that exemplify discourse strategies from cases that provide evidence
for fossilization? What theoretical justification, if any, is there
for characterizing features of non-native varieties as fossilization
and of the varieties themselves as interlanguages? Which characteristics
of the non-native varieties, as encountered in creative literature

or mature writing (i.e., by journalists, critics, authors, etc.), are to be treated as illustrations of bilingual's creativity as opposed to fossilization, overgeneralization, or ignorance of rule restrictions? These questions are serious; they cannot be swept under the rug. As has been stated above, most of the institutionalized non-native varieties are being used in their respective regions as media of higher education, administration, and for social interaction. To label them interlanguages denies vast populations of these countries a legitimate language for conducting their business.

Obviously, the question of a model of English for education and other purposes is crucial for the non-Western world (B. Kachru 1976 and 1982). As far as the users of the non-native varieties themselves are concerned, they are not in favor of a 'foreign' model, as is clear from the following tables:

(6) a. <u>Variety of English presently spoken by educated speakers:</u>

	Singaporeans %	Indians %	Thais %
1. British	40.5	27.4	6.5
2. American	6.0	3.2	28.1
3. Australian	0.6	0.0	0.0
4. Unique	42.3	50.6	40.3
5. Others	10.6	18.8	25.1

b. <u>The variety that we should learn to speak:</u>

	Singaporeans %	Indians %	Thais %
1. British	38.3	28.5	49.1
2. American	14.4	12.0	31.6
3. Australian	0.6	0.3	0.3
4. Own way	38.9	47.4	3.5
5. Others	7.8	11.8	15.5

(Shaw 1981:119-120)

(These results were obtained in a survey conducted among final year Bachelor degree students in Singapore, Hyderabad (India), and Bangkok (Thailand). There were 170 Singaporean, 342 Indian, and 313 Thai students.)

c. <u>Indian graduate students' self-labeling of their English:</u>

Identity marker	%
American English	2.58
British English	29.11
Indian English	55.64
'Mixture' of all these	2.99
I don't know	8.97
"Good" English	.27

(B. Kachru 1976:232)

(Kachru 1976 presents the results of a survey carried out in India that involved 700 Bachelor and Master's degree students in English, and 196 members of faculty and 29 heads of departments of English.)

It is clear from the above data that unlike the countries where English is used only for international purposes (e.g., Thailand), the institutionalized variety users prefer to characterize their English as their "own" rather than to conform to some "native" English norm. The tables in 6 support the sentiments expressed by scholars and creative writers in 4 above.

Communicative needs and the uses of English

Looked at from the point of view of communicative needs of the users of the localized forms of English, it is clear that the adoption of these varieties as models for teaching and learning in their respective regions is entirely justifiable. The differences that these varieties exhibit serve specific sociocultural needs such as satisfying certain conventions of linguistic interactions, whether through an oral or written mode. The following excerpt from an Iraqi news report demonstrates this dramatically.

(7) In the name of God, the merciful, the compassionate.

> Great Iraqi people, sons of the glorious Arab nations, it has been known to us from the beginning that many parties local international, were and still are behind the eagerness of the backward and suspect Iranian regime to stir up the dispute with, and conduct aggression against and begin the war against Iraq.

(from B. Kachru 1982:340)

The above are the opening paragrapns ot an official statement about the destruction of the Iraqi Osirak nuclear reactor by the Israeli forces in June 1981. The point of the story - the attack by Israeli forces - is mentioned in one sentence after five such short paragraphs. Such elaborate build-ups before coming to the point of a story is not unique to Iraqi Arabic. To quote Chishimba, "In the cultures of Africa, loquacity, ambiguity, redundancy, obscurity and other strategies of verbal discourse are markers of wisdom, age, knowledgeability, sex, and other socially relevant criteria." (Chishimba 1982:246-247).

What is suggested is that the unique features of non-native varieties deserve to be treated as evidence for bilingual's creativity rather than as evidence for fossilization (a la Selinker 1972), ignorance of rule restrictions, deficiency, etc. In cases where such features occur in literary texts, we have less difficulty in accepting them as stylistic innovations (Nelson 1984a, 1984b). In the case of expository prose or ordinary speech, however, there is an attitudinal factor that labels such innovations "un-English." Considering the range of variation in dialects within a native English-speaking country, and in varieties across different native English-speaking countries, it is not unreasonable to suggest that certain features of non-native varieties be accepted as legitimate variations. After all, the non-native variations in 8 below are no more severe than the native ones.

(8) British: Have you had your holiday yet?
    American: Did you have your vacation yet?
                            (Strevens 1977:149)

    British: different from, to
    American: different than
                            (Strevens 1977:150)

    Singaporean: So you have to go turn by turn.
                            (Platt, Weber and Ho 1983:48)

    African: ...we are seven and a half million strong and quite
               a number of these can not get jobs to do, so we
               should cut down on bringing forth.
                            (Bokamba 1982:88)

    Indian: The concept of idiolect I do not know if people
               still talk about it.
                            (IT 35:3, 1974:229)

This entails a new theoretical framework for research that starts
with the assumption that people learn languages in order to fulfill
certain communicative needs which may not coincide with the needs of
the native speakers of the target language. Consequently, second language
users develop their own strategies which result in differences at
each level of the target language structure as well as conventions
of its use. Second language acquisition research thus has to take
into account the findings of research in bi-/multilingualism.

Issues in methodology
As regards the question of methodology, several methods have been
proposed, adopted for a short time, and discarded as the fashions change
in second language pedagogy (Richards 1984). Very little empirical
evidence is available to support the claims of effectiveness for any
particular method, and yet, scarce resources continue to be invested
in following 'the trend' in ESL classrooms. In the eighties, there
is a definite shift from the audio-lingual method to the communicative
approach in the classroom, but, unfortunately, neither approach, as
currently conceptualized, takes any notice of the situation in non-
Western countries. The following is typical of many of the countries
listed in 1 and 2 above.

    (9) Teaching English in Gambia:

        a. General teacher information:

        Gender   Qualifications   Qualifications by gender
        67% male   27% qualified   28% men qualified
        33% female   73% unqualified   25% women qualified

        b. Bi-/multilingualism:

        Average teacher speaks 2.8 languages, one of which is English.

        34% bilingual, 48% trilingual, 15% speak four languages,
        3% speak five languages.

c. Patterns of language use: English used for banking; in linguistic interaction with the head teacher and other teachers; in teaching mathematics, sciences, social studies; in praising children for their performance; occasionally in interacting with the parents of children; occasionally in interacting with one's spouse, children and friends.

(Bowcock 1984)

There is an urgent need for research in the area of suitable methodology for language teaching in crowded, sparsely equipped classrooms as compared to the type of classrooms we are familiar with. Recently, a group of English teachers and teacher trainers from selected non-Western countries visited a number of TESL programs at U.S. universities. Their typical concerns were as follows:

(10) Pakistan: (college-level teaching)

Two of her biggest problems are large classes (100-200 students) and lack of sophisticated resources. She would like to learn as much as she can about strategies for teaching large classes and where to find (or how to make) inexpensive visual aids.

Sudan: (high school teacher training)

60-80 students are often in one class; what can be learned on this trip to help teach in this environment?

One can always take the position that these are impossible situations and ignore the whole question. As applied linguists, teacher trainers, teachers, and educators, however, I hope we accept the challenge instead.

Conclusion
In conclusion, we need serious, basic research that will lead us to adequate descriptions of English and other languages of wider communication around the world in their varied sociolinguistic contexts. This has to be accompanied by applied research in teaching methodology and curriculum and materials development. At the present state of our knowledge regarding what makes second language learning possible, it is more useful to encourage different methodologies, both tried and familiar methods as well as new ones, rather than to throw out any as being out-dated. As suggested in Diller (1981), different methods and classroom practices utilize different areas and different pathways of the brain and result in better success in learning. From a non-Western perspective, these are the challenges that applied linguistics and foreign language pedagogy face today.

NOTES
[1]Theoretically speaking, a distinction is made between second language learning and second language acquisition. Second language learning is said to be a conscious process that involves instruction whereas second language acquisition is characterized as a natural, unconscious process. Learning and acquisition are both learner-centered

as opposed to teaching, which is teacher-centered and does not take into account factors related to learners such as age, attitude, motivation, the difference between input (provided in the classroom) vs. intake (internalized by the learner), etc. There is, however, some doubt as to whether the distinction between learning and acquisition is so clear-cut (Diller 1981).

[2]See Sridhar (1980) for an insightful discussion of contrastive analysis, error analysis, and interlanguage.

[3]This is clear from recent publications meant for language teachers (and teacher trainers), e.g., Widdowson (1978), Brumfit and Johnson (1979), Finnochiaro and Brumfit (1983), and Savignon (1983).

[4]'Bilingualism or not' is the main title of Skutnaab-Kangas (1984) which contains a detailed discussion of the problem of minority education in Europe. The need for guest workers or immigrant laborers in the industrialized nations of Europe has created a situation where it is becoming increasingly obvious that the immigrant workers and, more importantly, their children have to have access to bilingual education if these nations are to avoid a great deal of social and political unrest.

[5]In addition to the sources listed in the References the following have provided additional data discussed in this study:

HLI = Singh, Amrik and P. G. Altbach, eds. 1974. The higher learning in India. Bombay: Vikas Publishing House; IL = Indian Linguistics, the journal of the Linguistic Society of India; and IT = India Today, a bimonthly magazine, comparable to Time. The quotes in this paper are from the overseas edition.

[6]I do not mean to suggest that all attested differences between native and non-native varieties are motivated by discourse considerations. Obviously, non-native varieties, too, just like the native varieties, have a range of dialect variation (e.g., basilect, mesolect, and acrolect in Singapore discussed in Lowenberg (1984a)). Also, in any body of attested data, it is likely that there will be a number of 'mistakes', whether the data is from a native or a non-native variety. What I am concerned with here is the variation that is due to discourse considerations. Most such innovations in non-native varieties result from restricting or extending the domains of specific devices of English, e.g., in the example in 5 under discourse, Indian English extends the function of such to a correlative of the relative pronouns who and where. It is worth remembering that such does function as a correlative in the constructions such as and such that in native varieties, too.

[7]See Davidson (1980) for a description and illustration of various methods practiced currently in the ESL classrooms.

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105

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PASSIVIZATION IN BANTU LANGUAGES : IMPLICATIONS FOR RELATIONAL GRAMMAR*

Nkonko Mudipanu Kamwangamalu

Perlmutter and Postal (1983) claim that the rule of
passive can be better described in terms of grammatical
relations, using primitives or traditional notions such as
subject of, direct object of, and indirect object of, generally
referred to as TERMS. On the basis of these, it is claimed that
in relational network, only TERMS and nothing else can passivize.
In other words, locatives and instrumentals are excluded from
participating in passivization. The main objective of this paper
is to show that Tshiluba and other Bantu languages (cf. Dalgish
1976) constitute a counter-example to Perlmutter and Postal's
(1983) claim. In particular, it will be shown here that
passivization in Tshiluba involves locatives, in addition to TERMS.
Data are presented which show that locatives in Tshiluba do all the
things that TERMS do : (1) they can govern agreement on the verb,
(2) they can passivize in both intransitive and transitive clauses.
The question that arises here is whether these passivizing
locatives should be treated as TERMS in Relational Grammar. This
paper strongly argues that they should and provides, in conclusion,
some suggestions as to how Relational Grammar could account for the
facts presented here and elsewhere in the Bantu literature.

1.0 Introduction

It has been claimed in Relational Grammar (Perlmutter and Postal
(1983) that only TERMS, that is, traditional notions such as subject of,
direct object of and indirect of, can passivize. In other words, non-TERMS
such as locatives, instrumentals, manners, etc. are excluded from
passivization. However, Dalgish (1976) presents data from Olutsootsoo, a
Bantu language of Kenya, which show that locatives in this language can
passivize. As of this writing, no analysis has been proposed that we know
of within Relational Grammar (hereafter RG) that accounts for Dalgish's
conclusions.

The main objective of this paper is to provide evidence from another
Bantu language, Tshiluba, spoken in the Republic of Zaire, in support of
Dalgish's claim, and to argue that passivization is not limited to TERMS
only. More specifically, it will be shown that in addition to TERMS,
Tshiluba allows the passivization of locatives in various types of clauses.
Locatives are shown to behave like TERMS not only with regard to
passivization, but also in terms of their ability to control subject-verb

agreement. Moreover, Tshiluba locatives, like TERMS, can undergo rules
such as raising, topicalization, left-dislocation, to cite some. With
regard to advancement, an analysis will be presented which shows that
locatives can passivize directly from their underlying position in an
active clause to the subject position in the passive clause. This will
be called direct passivization of the locatives. These last three
points, that is, locative raising, topicalization/left-dislocation and
direct passivization as well as constructions involving ditransitive
verbs plus a locative were not treated in Dalgish (1976). They will
therefore be discussed at length in this paper for they constitute,
in addition to agreement, strong evidence for the termhood of Bantu
locatives.

The paper is divided into two main parts. Part one provides, first,
an overview of the basic morpho-syntactic characteristics of Tshiluba to
familiarize the reader with the Tshiluba agreement system which is one
of the crucial pieces of evidence for the arguments to be advanced in
this paper. Second, a review of the treatment of passive in RG will be
presented to provide the background against which the data on the
passivization of locatives are analyzed. Part two presents a description
of passivization in Tshiluba within the RG framework along with a
discussion of locative raising, locative topicalization and/or left-
dislocation and direct passivization. This section of the paper examines
several types of passive sentences in Tshiluba, with particular emphasis
on locatives. It shows that locatives passivize in clauses with mono-
transitive verbs, clauses with ditransitive verbs, and in clauses with
intransitive verbs and that they can, like TERMS in RG, undergo raising
and left-dislocation, to cite just these two. Data from other Bantu
languages will be referred to in order to provide a broader view of the
phenomenon under consideration.

The abbreviations used in this paper include the following :
np: noun prefix; Loc: locative; T/A : tense and aspect; Ag : agreement;
FV : final vowel; PSV : passive ; SVA : subject-verb agreement.

2.0 Tshiluba Morpholgy and Syntax

This section sketches Tshiluba syntax and noun and verb morphology.
Tshiluba sentences will be translated wherever appropriate English
equivalents are possible. Otherwise, only word-for-word glosses will be
given.

2.1 Morphology. Morphology, both nominal and verbal, is very important
in Bantu syntax. Nominal morphology provides a clue to determining the
type of agreement that must obtain between a subject noun and a verb.

Verbal morphology determines, depending on the type of affix in presence, whether the affixed verb requires one or more objects. As it will be shown in the next section, a verbal suffix affixed to an intransitive verb stem, for example, may syntactically change an inherently intransitive verb into a transitive verb.

2.1.1 <u>Noun Morphology</u>. A noun in a Bantu language in general and in Tshiluba in particular consists of two morphemes : a noun prefix and a verb stem :

(1) a. di- tuku   'day'

    b. mu- kaji   'woman'

    c. ka- ba   'trap'

In (1), di- , mu- , and ka- are noun prefixes; -tuku, -kaji, and -ba are noun stems. For each noun stem, there are generally two noun prefixes, one singular and the other plural.[1] Thus, the plural correspondences for the nouns in (1) are as follows :

(2) a. ma- tuku   'days'

    b. ba- kaji   'women'

    c. tu- ba   'traps'

When various basic nouns like these are analyzed in terms of singular/ plural correspondence, several pairings emerge, traditionally referred to as noun classes in Bantu linguistics (cf. Bleek 1869, Guthrie 1967, etc.). Bokamba (1976) defines a noun class prefix as one of the distinct patterns of prefix agreement that a particular language may have, with the actual number of noun classes for such a language being determined by the distinct patterns of agreement exhibited. These noun class prefixes are traditionally grouped in pairs such as 1/2, 3/4, 5/6, etc. as in Table 1 below. The range of noun classes varies from one Bantu language to another (cf. Guthrie 1967). In Tshiluba, there are eighteen noun classes as indicated in Table 1. Three of these, class 16 <u>pa</u>-(on); class 17 <u>ku</u>-(to/at); and class 18 <u>mu</u>- (in), to which attention will mostly be focussed in this paper, are locatives.

Table 1

Tshiluba Noun Class and Subject-Verb-Agreement (SVA) System

class no.	np	SVA	Examples		Gloss
			Subject	Ag- Verb	
1	mu-	u-	mu-ntu	u - di	person/man is...
1a	∅	u-	∅ -taatu	u - di	father is ...
2	ba-	ba-	ba-ntu	ba- di	persons/men are...
2a	ba-	ba-	ba-taatu	ba- di	fathers are...
3	mu-	u-	mu-tshi	u - di	tree is ...
4	mi-	i-	mi-tshi	i - di	trees are ...
5	di-	di-	di-tuku	di- di	day is ...
6	ma-	a-	ma-tuku	a - di	days are ...
7	tshi-	tshi-	tshi-ibi	tshi-di	door is ...
8	bi-	bi-	bi-ibi	bi- di	doors are ...
9	N-	u-	n -zubu	u - di	house is ...
10	N-	i-	n -zubu	i - di	houses are...
11	lu-	lu-	lu-kasu	lu- di	hoe is ...
10	N-	i-	n- kasu	i - di	hoes are ...
12	ka-	ka-	ka-ba	ka- di	trap is ...
13	tu-	tu-	tu-ba	tu- di	traps are...
14	bu-	bu-	bu-dimi	bu- di	farm/field is...
06	ma-	a-	ma-dimi	a - di	farms/fields are...
15	ku-	ku-	ku-funda	ku- di	writing is...
16	pa-	pa-	pa-n-zubu	pa- di	on the house is...
17	ku-	ku-	ku-n-zubu	ku- di	at the house is...
18	mu-	mu-	mu-n-zubu	mu- di	in the house is ...

In this Table, column 1 indicates the noun class number ; column 2 the noun prefix (np) corresponding to the noun class number in column 1 ; column 3 presents the agreement prefix that appears on the verb in case a given noun class functions as subject of a clause. For example, if the noun dituku (day), which belongs to class 5, is used as subject of a clause, the agreement prefix on the verb will be di-, as shown in column 4. Similarly, if this noun is used in its plural form, matuku (days)(cf. class 6), the corresponding agreement prefix on the verb will be a-, as indicated in column 4. By the same token, locatives exhibit the same morphological and syntactic behavior as other noun class prefixes do. This can be seen in the underlined locative phrases at the bottom of Table 1.

2.1.2 Verbal Morphology. Athough the nominal morphology seems to be relatively simple, Tshiluba verbal morphology is very complex. A verb in Bantu languages in general and in Tshiluba in particular consists of an infinitive prefix or an agreement prefix followed by a tense marker, one or more optional derivational suffixes plus an obligatory inflectional suffix. It has been noted in Bantu linguistics that there are , morphologycally, at least six derivational suffixes in Bantu languages : (1) the applied, (2) the causative, (3) the reciprocal, (4) the reversive, (5) the passive and (6) the stative (Guthrie 1962 ; Scotton 1967 ; Eastman 1969 ; Givon 1971a ; Bokamba 1976 and forth-coming). In Tshiluba, these suffixes are : (1) applied : -il- ; (2) causative : -ish- ; (3) reciprocal : -angan- ; (4) reversive : -ul- ; (5) passive : -ibw- ; (6) stative : -an- / -ik-.

In addition to these simple derivational suffixes, Tshiluba has other types of suffixes such as (7) double causative : -ishish- ; (8) intensive : -ulul- ; (9) locative : -ilu ; (10) pejorative : -avi. Each of these ten suffixes, when affixed to the verb stem, changes not only the verb morphology but can also change its syntax and semantics. The following examples are illustrative :

(3) a. ku - kum - a 'to beat'

   b. ku - kum - il[2]- a ' to beat for'

   c. ku - kum - ish- angan- a 'to cause to beat each other'

In these examples, ku- is the infinitive prefix, -kum- is the verb stem, -il- in b is the applied suffix, -ish- and -angan- in c are respectively causative and reciprocal suffix, -a is the final vowel. As it can be noted here, the morphology of the verb in a is extended with the addition of the applied suffix in b and the causative and the reciprocal in c.

While in (3)a the meaning of the verb is just 'to beat', the effect of the added suffix in (3)b and c is remarkable as indicated in the gloss. Syntactically, the extended verb in (3)b requires an object and a benefactive whereas in (3)c , the effect of the added suffixes speaks for itself as evidenced in the gloss.

2.2. Syntax.

2.2.1 Word order. The assumed word order in a Bantu sentence is subject-verb-object. An adjective follows the noun it modifies. In (4) below, for example, baana (children), bakudya (they ate) and bibota (bananas) are respectively subject, verb and object. In (5), munene (fat/big) is an adjective and as such, it must follow the noun it modifies.

(4) ba – ana   ba – kudya   bibota

    np – children   Ag – eat   bananas
    (The children ate bananas.)

(5) mu – ntu   mu – nene

    np –person Ag – fat/big
    (fat/big person)

2.2.2. Grammatical Agreement. Each noun class in Table 1 governs agreement on the verb or adjective with which it occurs in a given phrase or sentence. Traditionally, two types of agreement are distinguished in Bantu linguistics : nominal or adjectival agreement and verbal agreement.

2.2.2.1 Adjective/Noun Agreement. This type of agreement generally involves the copying of the appropriate prefix of the modified noun onto the modifying adjectival stem as shown in (5) above as well as in the following additional examples.

(6) di – tama   di – kese

    np – cheek Ag – small
    (small cheek.)

(7) mu– nzubu   mu –nene

    np/Loc– house   Ag – big
    (in the big house.)

(8) ma - kasa   ma - le

   np - feet   Ag - long
   (long feet)

2.2.2.2 <u>Subject/Verb Agreement</u>. Verbal agreement is characterized by
the copying of the features specification of the subject noun or pronoun,
which include animacy, class membership, person and number, onto the verb
(cf. Table 1, column 4.). Each verb must agree in number, noun class
and person with its subject (there is no object-verb agreement in
Tshiluba) by means of a prefix as can be seen in the following examples:

(9) ku   - nzubu ku - aka   ku - di   muntu

   np/Loc- house Ag - there   Ag - is   person

   at   house   there   is a person
   (There is a person at that house.)

(10) mu   - nzubu mu- amwa   mu - di   muntu

   np/Loc- house Ag- there   Ag - is   person

   in   house   there   is a person
   (There is a person in that house.)

(11) pa   - mesa (p)a- (p)a pa - di   bintu

   np/Loc- table Ag - there Ag - are   things

   on table   there are things
   (There are things on that table.)

(12) bi -bota   bi - di   pa   -mesa

   np -bananas   Ag - are   np/Loc- table

   bananas   are   on table
   (Bananas are on the table.)

The locatives <u>ku-</u>, <u>mu-</u>, and <u>pa</u>- are shown to govern agreement on the
verb in (9), (10) and (11) respectively. In (12), the TERM <u>bibota</u>
(bananas) governs agreement on the verb -<u>di</u> (are) by means of the
prefix <u>bi</u>- . To sum up, this section has been concerned with a brief
presentation of Tshiluba morphology and syntax . This was to introduce
the reader to the Tshiluba agreement system and to show that all noun
prefixes in Tshiluba, including locatives, govern agreement on the verb.
For a more detailed discussion on agreement in Bantu languages, the

reader is referred to Bokamba (1976, and forthcoming). I will now discuss the passive in Relational Grammar.

3.0 Passivization in Relational Grammar

Passivization is a central problem in RG. This theory argues that many attempts have unsuccessfully been made in structuralist and transformational grammar to characterize the passive in terms of word order, case marking and verbal morphology. These attempts have proven unfruitful because not all languages have the same word order ; not all languages have the same case marking ; and not all languages distinguish between active and passive clauses in terms of verbal morphology. So, any theory that attempts to characterize passivization in terms of either of the above criteria (i.e. word order, case marking, verbal morphology) is but inadequate and cannot capture generalizations about the passive as a universal rule.

Relational Grammar claims that the rule of passive can be better described in terms of grammatical relations such as subject of (hereafter SU), direct object of (DO), and indirect object of (IO). On the basis of these primitives, Perlmutter and Postal (1983) assume that a clause universally consists of a network of grammatical relations and that among these are SU, DO, and IO. In the light of this assumption, they claim that there are two universals of passivization across languages:

(13) 'A direct object of an active clause is the (superficial) subject of the corresponding passive clause.

(14) The subject of an active clause is neither the (superficial) subject nor the (superficial) direct object of the corresponding passive clause. So, passive is a (superficial) intransitive clause' (1983:9).

On account of the above claim and assumption, Perlmutter and Postal state that the passive is a rule which sanctions 1-hood [3] in an immediately successive stratum for a nominal which is a 2 of a clause at a stratum in which some nominal is a 1. This formulation of the rule of passive implies that apart from an initial 2 of an active clause, nothing else can become the subject of a passive clause prior to advancement to 2. This is counter-examplified by the data discussed in this paper which show that 3's and locatives can passivize directly from their initial position in an active clause to the subject position

in the passive clause. In so doing, the passivizing 3's or locatives do
not affect the grammatical relation initially borne by a 2 (or a 2 and
a 3 in the case of a passivizing locative). In other words, the only
TERM that is put en chômage by such a direct passivization is the
initial 1 of an active clause. I will elaborate more on this with
several examples as we proceed.

The key notion in characterizing passivization in terms of
grammatical relations SU, DO, and IO is the concept of TERMHOOD.
RG claims that there are only three TERMS, namely those primitives just
described. According to RG, only these three TERMS, i.e. SU (or 1),
DO (or 2) and IO (or 3 (via 2 advancement)) and nothing else can
passivize. To avoid ill-formed clauses, Perlmutter and Postal have
formulated laws or constraints which govern the grammatical relations
that TERMS bear to the predicate. Among these laws are the Stratal Unique-
ness Law, Chômeur Law, Agreement Law, to cite just three (Perlmutter and
Postal 1983: 88-101; cf. also Frantz 1981: 71). The Stratal Uniqueness
Law states that each TERM bears one and only one grammatical relation
to the predicate. The Chômeur Law says that if some nominal, Na, bears
a given TERM relation in a given stratum S , and some other nominal, Nb,
bears the same relation in the following stratum, S+1, then Na bears the
chômeur relation in S+1. The Agreement Law states that only nominals
bearing TERM relation in some stratum may trigger verb agreement. These
Laws can be illustrated as follows :

(15)a. The hunter killed two elephants

b. Two elephants were killed by the hunter

killed   the hunter   two elephants
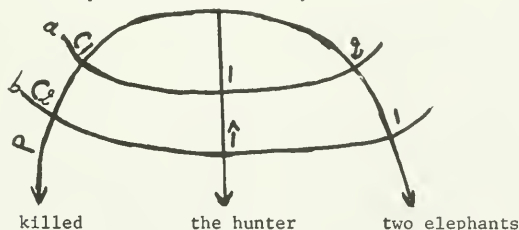
By virtue of the passive rule, the TERM (two) elephants, which is a 2
in the initial stratum C1, becomes a 1 in stratum C2. Similarly, the

TERM hunter, which is a <u>1</u> on stratum C1, can no longer by virtue of the
Stratal Uniqueness Law, bear the same relation as (two) elephants in
stratum C2 and by the Chômeur Law, it is put en chômage on this stratum.
By virtue of the Agreement Law, the TERM (two) elephants may govern
agreement on the verb in the final stratum C2. I will now turn to
passivization in Tshiluba.

4.0 Facts about the passive in Tshiluba

In this section, various cases of passivization will be analyzed.
I will successively discuss passivization in (1) clauses with mono-
transitive verbs ; (2) clauses with ditransitive verbs ; (3) complex
clauses (i.e. clauses with verbal extension) ; and (4) clauses with
locatives in order to demonstrate that locatives in Tshiluba behave
both morphologically and syntactically like TERMS in Relational Grammar.

4.1 Passivization of TERMS in clauses with monotransitive verbs.

(16)a. Mwana u- aku- di - a di- bota

child Ag- T/A- eat -FV np- banana
(The child ate the banana.)

b. Di- bota   di- aku- di -ibw - a kudi mwana

np- banana Ag- T/A- eat -PSV -FV by   child
(The banana was eaten by the child.)

(17)a. Bantu ba- aku- injil - a tshi- ibi

men   Ag- T/A- close -FV   np- door
(The men closed the door.)

b. Tshi- ibi   tshi- aku- injid- ibw - a kudi bantu

np- door   Ag- T/A- close- PSV -FV by   men
(The door was closed by the men.)

The relational treatment of (16) and/or (17) is straightforward. In
(16)a , for example, mwana (child) and dibota (banana) will respectively
bear the <u>1</u> and the <u>2</u>-relation to the predicate -di-a (eat). But in (16)b,
dibota (banana) is the superficial <u>1</u> of the passive clause whereas
mwana (child) is, by virtue of the Stratal Uniqueness Law and the Chômeur
Law, put en chômage on the final stratum. The stratal diagram for (16) .

for example is as shown here :

wakudia   mwana   dibota

(he ate)   (child)   (banana)
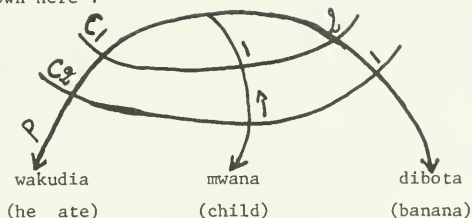
4.2. Passivization of TERMS in clauses with ditransitive verbs.

(18)a. Mu- ntu u- aku- p   - a ba- ana   bi- muma

np- man Ag- T/A- give-FV np- children np- fruit
(The man gave fruit to the children.)

b.*Mu- ntu u- aku- p   - a bi- muma ba- ana

np- man Ag- T/A- give-FV np- fruit np- children
(*The man gave the children to the fruit)

c. Ba- ana   ba- aku- p   - ibw- a bimuma kudi muntu

np- children Ag- T/A- give- PSV-FV fruit by   man
(The children were given fruit by the man.)

d. bi- muma   bi- aku - p   -ibw- a baana   kudi muntu

np- fruit Ag- T/A - give -PSV-FV children by .man
(The fruit were given to the children by the man.)

In (18)a, muntu (man), baana (children) and bimuma (fruit) are 1,
3 and 2 respectively. Tshiluba distinguishes between animate and
inanimate objects and requires that when these co-occur in a clause,
the animate come immediately after the verb as the TERM baana does in
(18)a, preceding the TERM bimuma , which is actually a 2 in this
clause. The violation of this constraint on Tshiluba word order
results in an ungrammatical structure as shown by the unacceptability
of (18)b where the inanimate bimuma precedes the animate baana.
Moreover, not only does the change of the word order make (18)b

unacceptable, but it also changes the resulting meaning. The initial $\underline{3}$, i.e. baana (children) in (18)a can passivize as in (18)c without affecting the grammatical relation initially borne by the $\underline{2}$, i.e. bimuma (fruit),to the predicate -pa (give). The same is true of $\underline{2}$ when it passivizes as indicated in (18)d. So, there seems to be no evidence for $\underline{3}$ to $\underline{2}$ advancement in Tshiluba. With regard to the word order, it will be assumed here that when animate and regardless of whether it is a $\underline{DO}$ or an $\underline{IO}$, the object of a clause comes immediately after the verb. Apart from this, even if we assume that in terms of the grammatical relation assignment, the animate and the inanimate objects of an active clause in Tshiluba are initially a $\underline{2}$ and a $\underline{3}$ respectively, this will not allow $\underline{3}$ to $\underline{2}$ advancement because the resulting structure will still prove ungrammatical as shown in (18)b. In other words, such an advancement implies that the hypothetical initial $\underline{3}$, i.e. bimuma (fruit), will advance to $\underline{2}$ and as a result, the hypothetical initial $\underline{2}$, i.e. baana (children), will bear the chômeur relation to the predicate -pa (give) by virtue of the Stratal Uniqueness Law. The resulting structure in this hypothetical advancement is but (18)b just discussed, which violates the constraint referred to above on the Tshiluba word order. So, both the grammatical relation assignment and the Tshiluba word order seem to provide no evidence at all for $\underline{3}$ to $\underline{2}$ advancement. It will then be assumed, with regard to the former (i.e. grammatical relation assignment), that an animate $\underline{IO}$ of an active clause is a superficial $\underline{2}$ and that the $\underline{DO}$ is a superficial $\underline{3}$, since no advancement of $\underline{IO}$ to $\underline{DO}$ proves to be allowed in Tshiluba. A rather strong claim is in order here. That is, advancement in Tshiluba is $\underline{X}$ (i.e. 2, 3, or Loc) to $\underline{1}$. Put another way, there is, at least for all the cases considered here, no such a thing as $\underline{3}$ to $\underline{2}$ or $\underline{Loc}$ to $\underline{3}$ to $\underline{2}$ advancement in Tshiluba. Several cases will be discussed in support of this claim which holds of passivization of TERMS in complex clauses to which I turn now.

4.3. Passivization of TERMS in complex clauses. It has been noted in the discussion of the Tshiluba verbal morphology that there are about ten verbal suffixes in Tshiluba. How many of these can be affixed at a time to a verb stem is immaterial here. A verb can passivize regardless of whether it is affixed with some of these suffixes. Given the semantic complexity that results when more than two suffixes are affixed to a verb stem, the number of suffixes on the verbal stems will be limited to two, namely, the causative and/or the applied.

The following examples illustrate the passivization of TERMS in clauses with the applied suffix:

(19)a. Mutombo u-aku - sumb -   il   - a bantu   bilunga

    Mutombo Ag-T/A - buy   -Applied -FV men   potatoes
    (Mutombo bought potatoes for the men.)

b.*Mutombo u-aku - sumb -   il   - a bilunga bantu

    Mutombo Ag-T/A - buy   -Applied -FV potatoes men
    (Mutombo bought men for the potatoes.)

c. Ba-ntu ba- aku- sumb- id   - ibw- a bilunga kudi M.

    np-men Ag- T/A- buy - Applied - PSV-FV potatoes by M.
    (The men were bought potatoes for by Mutombo.)

d. Bi-lunga bi-aku- sumb- id   - ibw- a bantu kudi M.

    np-potatoes Ag-T/A-buy-Applied - PSV-FV men   by   M.
    (The potatoes were bought for the men by Mutombo.)

The relational treatment of these structures is similar to that proposed for (18)a-d above. In (19)a, I assume that Mutombo, bantu (men) and bilunga (potatoes) are respectively 1, 2, and 3. An alternative to this could be that the TERM bantu and bilunga be considered as 3 and 2, respectively. However, this would imply that there is 3 to 2 advancement which starts out of an ungrammatical structure listed in (19)b to end up with the structure in (19)a. This alternative is inconsistent with the notion of animacy/inanimacy discussed above, which requires that the animate object of a clause, regardless of whether it is a DO or an IO, come initially after the verb. It is worth mentioning here that there is no need to provide cases of passivization in clauses with the causative suffix since the rule of passive in such clauses operates exactly as in those with the applied suffix. In other words, all the TERMS involved in constructions with the causative suffix do indeed passivize in the way already described above and do obey the constraint on Tshiluba word order and grammatical relation assignment. This constraint has already been illustrated in clauses such as (18)a and (19)a each of which has two objects: one animate and the other inanimate. But what happens in case two animate objects co-occur in the same clause? What is the syntactic behavior of TERMS in such a case? It has been demonstrated that when an animate

object and an inanimate object co-occur in a clause, the former comes immediately after the verb. In case two animate objects co-occur in a clause, the animate IO must, regardless of the presence of the animate DO, come immediately after the verb. This provides more evidence for the claim that there is no istance of (Loc to) 3 to 2 advancement in Tshiluba but that there is, instead, X to 1 advancement. The following structures are illustrative:

(20)a. Baaba   u- aku- p - a taatu   baana

        mother   Ag- T/A- give-FV father   children
        (Mother gave the children to Daddy.)

   b.*Baaba   u- aku- p - a baana   taatu

        mother   Ag- T/A-give -FV children   father
        (Mother gave Daddy to the children.)

   c. Baana   ba-aku- p - ibw- a taatu kudi baaba

        children Ag-T/A-give- PSV-FV father by mother
        (The children were given to Daddy by mother.)

   d. Taatu   u-aku- p - ibw - a baana   kudi baaba

        father   Ag-T/A- give- PSV -FV children by   mother
        (Daddy was given the children by mother.)

Here again, the relational treatment of these structures is straight-forward. The TERM baaba (mother), taatu (daddy) and baana (children) in (20)a are respectively 1, (superficial) 2 and (superficial) 3. An alternative to this could be that proposed for (19) according to which the TERM taatu (daddy) and baana (children) could be considered to have undergone 3 to 2 advancement starting out of the ungrammatical structure given in (20)b to provide the structure listed in (20)a. However, it has already been demonstrated that this alternative is incompatible with the claim that when two animate objects co-occur in a clause, the Tshiluba syntax requires that the IO come, regardless of the presence of the animate DO, immediately after the verb. This explains, as a matter of fact, why the change of the word order operated in (20)b and the meaning resulting thereof are but unacceptable in Tshiluba. When the constraint on the Tshiluba word order is not violated, the resulting structures prove entirely grammatical and acceptable as

illustrated in (20)c and d. The TERM baana (children), a superficial
3 in (20)a, has passivized directly from this position to the subject
position in the passive clause (20)c. Note that in so doing, it does
not bump taatu (daddy), the superficial 2, into chômage. Similarly,
the TERM taatu , a superficial 2 in (20)a, passivizes directly from
this position to the subject position in the passive clause (20)d.

Some of the cases considered so far prove to be handled perfectly
by means of grammatical relations in terms of TERMS. Others, however,
are left open. Contrary to the claim in RG that no 3 advances to 1
without advancing first to 2, Tshiluba 3's appear to passivize directly
from their initial position in an active clause to the subject position
in the passive clause. The most crucial fact here is that the 3's
going to 1's do not bump existing 2's to 2̂'s, which they should by the
Stratal Uniqueness Law if they actually advanced to 1's via an
intermediate 2-stage. This way of passivizing a TERM directly from
whatever position in an active clause to the subject position in the
passive clause without affecting the grammatical relations initially
borne by other TERMS (or non-TERMS) has been referred to above as
'direct passivization of TERMS'. It will be shown hereafter that
direct passivization of TERMS holds, not only of the Tshiluba data,
but also of the following Lingala and Kiswahili data which show that
3 to 2 advancement is not operative in these Bantu languages either.

Lingala

(21)a. Mama   a -somb - el   - i mu-ana   li- kemba

         mother Ag -buy -Applied-FV np-child np- plantain
         (Mother bought a plantain for the child.)

     b.*Mama   a -somb - el   - i li-kemba   mu-ana

         mother Ag -buy -Applied-FV np-plantain np-child
         (*Mother bought a child for the plantain.)

     c. Mu-ana   a -somb - el   - am - i likemba (na mama)

         np-child Ag -buy -Applied-PSV-FV plantain(by mother)
         (The child was bought a plantain for by mother.)

     d. Li-kemba   li- somb- el   - am - i mwana (na mama)

         np-plantain Ag- buy - Applied- PSV-FV child (by mother)
         (The plantain was bought for the child by mother.)

Kiswahili

(22)a. Mama   a - li - (m)   - nunu-   li   - a mtoto ndizi

      mother Ag - T/A-(OP)[4] - buy-Applied-FV child bananas
      (Mother bought bananas for the child.)

   b.*Mama   a - li -(zi)   - nunu-   li   - a ndizi   mtoto

      mother Ag - T/A-(OP)   - buy -Applied-FV bananas child
      (*Mother bought the child for the bananas.)

   c. Mtoto   a - li - nunu - li   - w   - a ndizi

      child   Ag - T/A- buy   -Applied- PSV -FV bananas
      (The child was bought bananas for by mother.)

   d. Ndizi   zi- li - (m)- nunu - li   - w - a   mtoto

      bananas   Ag- T/A- (OP)- buy   -Applied-PSV-FV child
      (The bananas were bought for the child by mother.)

These data indicate that the TERM mwana (child) and likemba (plantain)
in (21)a can passivize directly as in (21)c and d. Similarly, the
TERM mtoto (child) and ndizi (bananas) in (22)a can passivize
directly as shown in (22)c and d respectively. Note that here again,
none of these passivizing TERMS affects the grammatical relation
initially borne by other TERMS to the predicate. Unless we assume
that 3 to 2 advancement starts out of ungrammatical structures such
as the Tshiluba (18)b, (19)b, and (20)b; Lingala (21)b and Kiswahili
(22)b, it makes no sense to speak about 3 to 2 advancement or
X to 3 to 2 advancement in these languages. Let us now turn to
passivizing locatives in Tshiluba.

5.0 Tshiluba passivizing locatives.

    In this section, I will discuss the passivization of locatives
in simple and complex sentences. It is shown that locatives passivize
freely in transitive as well as intransitive clauses. Support for the
termhood of locatives lies not only in their independently motivated
passivizing in such clauses, but also in their syntactic property of
governing agreement on the verb whenever they are used as clause head.
In addition, constructions involving raising and left-dislocation

will be considered which show that both TERMS and the so-called
non-TERMS, i.e., locatives, can undergo object to subject raising,
subject to subject raising, and left-dislocation. Also, it is
demonstrated that locatives, like 3's in Tshiluba, can undergo
what we have referred to as direct passivization. In other words,
there is no such a thing as Loc to 3 to 2 to 1 advancement in this
language. There is , instead, Loc to 1 advancement. It will be argued
that both 3's and locatives undergo direct passivization. That is,
again, any passivizing locative or TERM does not affect the existing
grammatical relation initially borne by other elements, TERMS or
non-TERMS, to the predicate. Data from other Bantu languages will be
presented, as above, in support of this argument. To start with, let
us consider the passivization of locatives in clauses with mono-
transitive verbs.

5.1 Passivization of locatives in clauses with monotransitive verbs.

(23)a. Mwivi u-aku- kum - a baana   mu   - nzubu

thief Ag-T/A- beat -FV children np/Loc- house
(The thief beat the children in the house.)

b.*Mwivi u-aku- kum - a mu   - nzubu baana

thief Ag-T/A- beat -FV np/Loc- house children
(*The thief beat in the house the children)

c. Mu   - nzubu mu - aku- kum- ibw- a baana kudi mwivi

np/Loc- house Ag - T/A- beat-PSV-FV children by thief
(Lit: In the house were beaten the children by the thief.)

d. Baana   ba -aku- kum- ibw - a mu   -nzubu kudi mwivi

children Ag -T/A-beat- PSV -FV np/Loc-house by thief
(The children were beaten in the house by the thief.)

(23)b is ruled out by the constraint of animate/inanimate in Tshiluba.
Nevertheless, one would expect that the locative mu-nzubu (in the
house) in (23)a will first advance to 2 before advancing to 1 as it
is required in RG. However, Loc to 2 advancement is ruled out because
the resulting structure proves ungrammatical as indicated in (23)b.
Instead, the locative mu-nzubu passivizes directly from its initial
position in (23)a to its actual position in the passive clause (23)c.

Other locative phrases in Tshiluba behave the same way. The following data from Kiswahili, also a Bantu language, attest that locatives in this language too do not undergo Loc to 2 advancement, if ever such a thing as locative advancement or promotion could fit in the hierarchy of TERMS in Relational Grammar.

Kiswahili

(24)a. Mama   a - li - wek - a chakula kwenye meza

       mother   Ag - T/A- put -FV food   Loc(on) table
     (Mother put food on the table.)

   b.*Mama   a - li - wek - a kwenye   meza chakula

      mother   Ag - li - wek - a kwenye   table food
     (*Mother put on the table food)

   c. Kwenye   meza   ku - li- wek- w - a chakula (na mama)

      Loc (on)   table   Ag - T/A-put-PSV-FV food (by mother)
     (Lit: On the table was put food by mother.)

(24)b attests to the fact that locative phrases in Kiswahili, like the Tshiluba case discussed above (cf. (23)b), do not undergo Loc to 2 advancement. The structures discussed so far strongly support the claim that passivization of locatives, at least in the languages considered here, is a one-step process, that is, Loc to 1 advancement rather than Loc to 3 to 2 to 1 as required in RG. This claim also holds of the passivization of locatives in clauses with ditransitive verbs as it will be shown in the following section.

5.2 Passivization of locatives in clauses with ditransitive verbs

(25)a. Mu-longeshi u-aku- p - a baana   bibota   ku   -kalasa

       np-teacher Ag-T/A-give-FV children bananas Loc (at)-school
     (The teacher gave bananas to the children at school.)

   b.*Mulongeshi   u-aku- p - a baana   ku - kalasa bibota

      teacher   Ag-T/A-give-FV children Loc- school banana
     (*The teacher gave at school the children bananas.)

c.*Mulongeshi   u-aκu- p - a <u>ku -kalasa</u> baana   bibota

   teacher   Ag-T/A-give -FV Loc-school children bananas
   (*The teacher gave at school the children bananas.)

d. <u>ku -kalasa</u> ku-aκu- p -ibw- a baana   bibota kudi mulongeshi

   Loc -school Ag-T/A-give-PSV- FV children bananas by   teacher
   (Lit: At school were given the bananas to the children by the
        teacher.)

In (25)<u>a</u>, <u>Mulongeshi</u> (teacher), <u>baana</u> (children), <u>bibota</u> (bananas) and
<u>ku-kalasa</u> (at school) are <u>1</u>, <u>3</u> (or superficial <u>2</u>), <u>2</u> (or superficial <u>3</u>)
and locative respectively. The ungrammaticality of (25)<u>b</u> and <u>c</u> indicates
that there is no Loc to <u>3</u> to <u>2</u> advancement in Tshiluba. Instead, the
locative <u>ku-kalasa</u> (at school) is shown to passivize directly from its
original position in (25)<u>a</u> to its actual position in the passive clause
(25)<u>d</u>. The crucial point here is that in passivizing directly as above,
this locative does not affect the initial <u>2</u> and <u>3</u>. These two remain the
same, bearing their respective original grammatical relation to the
predicate -<u>pa</u> (give).

   To sum up, RG proves empirically inadequate because, contrary to
the claim it makes that only TERMS can passivize, it provides no way to
account for cases like those discussed here in which it has been
sufficiently demonstrated that locatives, like TERMS, can indeed
passivize freely in all kinds of constructions, namely, constructions
with monotransitive verbs , constructions with ditransitive verbs, and
those with verbal extension. Moreover, it will be shown in the following
section that locatives can passivize in intransitive clauses as well,
i.e., independently of whether they occur with some nominal in a clause.
In other words, I consider locatives as object in the way described in
Dalgish (1976) and Stucky (1976) and as such, they can transitivize
intransitive clauses and passivize in the latter as illustrated in (26):

(26)a. Mwana   u-di mu- iman- a pa   -mesa

       child Ag-is Ag-stand-FV Loc(on)-table

       (The child is standing on the table.)

   b. Pa   -mesa   pa-di pa- iman-ibw- a kudi mwana

      Loc(on) -table Ag-is Ag-stand-PSV-FV by   child

      (Lit: On the table is stood by the child.)
           The table is stood on by the child

(26)<u>b</u> is the passive counterpart of the active intransitive clause (26)<u>a</u>.
Note also the passive suffix -<u>ibw</u>- on the verb -<u>iman</u>- (stand). Here again,

RG has provided no analysis that is known of which would account for
sentences like (26)b in which the locative pa-mesa (on the table) is
subject. Before drawing a general conclusion, the rule of raising and
left-dislocation will be discussed in order to examine the morphological
and syntactic behavior of TERMS and locatives in constructions involving
these rules. It will be argued here that these rules can apply without any
modification whatsoever to both TERMS and locatives.

5.3 Locative Raising and Left-Dislocation in Tshiluba. Constructions
which involve raising in Tshiluba require the verb ku-mwenek-a (seem) or
the phrase bu mutu ne (as if) either of which can be used with any of the
following forms of the verb ku-ikal-a (be) to yield phrases similar to the
English you seem, he seems, it seems, etc. (27)a-c illustrates some of the
forms of the irregular verb ku-ikala (be) whereas (28) shows the
combination of these forms with the verb kumweneka (to seem) to yield the
equivalent of the English phrases listed in the gloss.

(27) a. ú-dí/ ú-vwá (You are/were)

     b. ù-dí/ ū-vwá ((s)he is/was)

     c. bì-dí/ bì-vwá (it is / was)

(28) a. ú-dí/ ú-vwá u – mwenek – a (ne)

        you-are/you-were Ag-seem-   FV (that)
        (You seem/seemed (that).)

     b. ù-dí /ù-vwá u – mwenek – a (ne)

        he-is /he-was Ag- seem – FV (that)
        (He/she seems/seemed (that).)

     c. bì-dí/ bì-vwá   bi- mwenek – a (ne)

        it-is/ it-was   Ag- seem   -FV (that)
        (It seems/seemed (that).)

bi in (28)c is a neutral prefix generally used for unspecified subject.
The phrase bi-di bimwenek-a (it seems) in (28)c can be used in
constructions such as (29)a below in which object to subject raising
(hereafter OSR) and subject to subject raising (SSR) may apply to yield
the structures given in (29)b-f.

(29) a. Bi-di bi-mwenek-a   ne baana   ba-vwa ba-tek- a

          it-is Ag-seem-FV that children Ag-were Ag-put-FV

          bu-kula pa   – makala
          np-four Loc(on)- charcoal

(It seems that the children put the flour on the charcoal.)

b. Ba-ana   ba-di ba-mwenek-a ne ba-vwa ba-tek-a bu-kula
   np-children Ag-are Ag-seem-FV that Ag-were Ag-put-FV np-flour

   pa   - makala
   Loc(on)- charcoal

   (The children seem that they put the flour on the charcoal.)

c. Bu-kula   bu-di bu-mwenek-a ne baana   ba-vwa ba-<u>bu</u>-tek- a
   np-flour Ag-is Ag-seem- FV that children Ag-were Ag-<u>OP</u>-put-FV

   pa   - makala.
   Loc(on)-charcoal.

   (The flour seems that the children put <u>it</u> on the charcoal.)

d.*Bu-kula bu-di bu-mwenek-a ne baana   ba-vwa ba-teka
   np-flour Ag-is Ag-seem- FV that children Ag-were Ag-put

   pa   - makala
   Loc(on) - charcoal.

   (*The flour seems that the children put on the charcoal.)

e. Pa   -makala   pa-di pa-mwenek- a ne   baana   ba-vwa
   Loc(on)-charcoal Ag-is Ag-seem -FV that children Ag-were

   ba-<u>pa</u>-tek- a bukula
   Ag-<u>OP</u>-put-FV flour

   (Lit: On the charcoal seems that the children put on <u>it</u> the
      flour.)

f.*Pa   -makala   pa-di pa-mwenek- a ne   baana   ba-vwa
   Loc(on)-charcoal Ag-is Ag-seem -FV that children Ag-were

   ba-tek- a bukula.
   Ag-put-FV flour .

   (On the charcoal seems that the children put the flour.)

Here, (29)b is the case of subject to subject raising (SSR). In this
structure, the TERM baana (children),which is actually the subject of
the embedded clause baana bavwa bateka bukula pamakala (the children put
the flour on the charcoal),is raised to the subject position in the matrix
clause. The difference between (29)a and b is that in the former, the
dummy bi-di (it is) governs agreement on the verb -mweneka (seem) whereas
in the latter, it is not the dummy but rather the TERM baana (children)
that governs agreement all the way through by means of the prefix ba- (cf.
(29)b). (29)c is the case of object to subject raising (OSR). The TERM
bukula (flour),which is actually the object of the embedded clause referred
to above,has been raised to the subject position in the matrix clause as
shown in (29)c. Similarly, the locative phrase pa-makala (on the charcoal)
has been raised to the subject position as illustrated in (29)d. Note here
that raising applies in the same way for both TERMS and locatives. When
OSR applies for example, Tshiluba syntax requires that a clitic pronoun
referring to the raised object or locative appear on the verb as indicated
by the underlined clitic or object pronoun (OP) -bu-, referring to bukula
(flour) in (29)c , and the clitic -pa-, referring to the locative pa-makala
(on the charcoal) in (29)e . In case the clitic pronoun does not surface
where the Tshiluba syntax requires it to, the resulting structure will be
unacceptable as shown in (29)d and f. This constraint does not seem to be
operative in the case of SSR as indicated by the grammaticality of (29)b
in which no clitic pronoun is required to appear. Similarly, when a
locative is the subject of an embedded clause, this constraint does not
seem to be operative either. This point is illustrated in (30)a below to
which SSR has applied to yield the structure listed in (30)b.

        (30)a. Bi-di bi-mwenek-a ne mu   -mulangi mu-di mayi

              it-is Ag-seem -FV that Loc(in)-bottle Ag-is water

              (It seems that there is water in the bottle.)

            b. Mu   -mulangi mu-di mu-mwenek-a ne mu-di maayi

              Loc(in)-bottle Ag-is Ag-seem -FV that Ag-is water

              (Lit: In the bottle seems that there is water.)

The locative mu-mulangi (in the bottle), which is initially the subject
of the embedded clause mu-mulangi mudi maayi (in the bottle is water) in
(30)a, has been raised to the subject position in the matrix clause as
illustrated in (30)b. For both the TERM baana (children) in (29)b and the
locative mu-mulangi (in the bottle) in (30)b, the operation of SSR does
not require that a clitic pronoun appear on the verb of the embedded
clause. The data presented here demonstrate that locatives behave
like TERMS not only with regard to passivization, but also, with regard to
other rules such as raising. Apparently, this rule seems to operate like
left-dislocation. However, although both raising and left-dislocation

appear to share some syntactic properties as it will be shown below, these
two rules are indeed distinct. In the case of raising, whether OSR or SSR,
it is the raised TERM or locative that governs agreement on the verb. But
in the case of left-dislocation, it is not the left-dislocated TERM or
locative but rather the logical subject or locative of a clause
that governs agreement on the verb. The following structures are
illustrative :

    (31)a. Ba- ana   ba-di ba-nanga bi-muma

          np-children Ag-are Ag-like   np-fruit
          (Children like fruit.)

      b. Bi-muma, ba-ana   ba-di ba-<u>bi</u>-nanga

          np-fruit np-children Ag-are Ag-<u>OP</u>-like
          (Fruit, children like them.)

      c.*Bi-muma, ba-ana   ba-di ba-nanga

          np-fruit np-children Ag-are Ag-like
          (Fruit, children like)

    (32)a. Ba-ana   ba-aku-komb- a mu   -nzubu

          np-children Ag-T/A-clean-FV Loc(in) -house
          (The children cleaned the house.)

      b. Mu   -nzubu, ba-ana   ba-aku-<u>mu</u>-komb- a

         Loc(in) -house np-children Ag-T/A-<u>OP</u>-clean- FV
         (Lit: In the house, the children cleaned <u>in it</u>.)

      c.*Mu   -nzubu, ba-ana   ba-aku-komb- a

         Loc(in) -house np-children Ag-T/A-clean-FV
         (In the house, the children cleaned.)

Here, the TERM <u>bimuma</u> (fruit) is a <u>2</u> in (31)<u>a</u> and so is the Loc <u>mu-nzubu</u>
(in the house) in (32)<u>a</u>. They each have been left-dislocated as illustrated
in (31)<u>b</u> and (32)<u>b</u> respectively. In neither case, the left-dislocated
TERM or Loc governs agreement on the verb. Left-dislocation, like OSR,
requires that a clitic pronoun show up on the verb of the clause in which
it applies. Otherwise, the resulting structure is but unacceptable as
shown in (31)<u>c</u> and (32)<u>c</u>.

6.0 <u>Conclusions and implications</u>. The basic claim throughout this paper
has been that Tshiluba locatives passivize and as such, they should be
included in the hierarchy of TERMS in Relational Grammar. Data from other

Bantu languages such as Olutsootsoo (cf. Dalgish 1976), Lingala and
Kiswahili appear to support this claim. Syntactically and morphologically,
Tshiluba locatives do all the things that TERMS do : (1) they can govern
agreement on the verb , which gives them support by the RG Agreement
Law ; (2) they can undergo all the rules that apply to TERMS, amongst
others, passive, raising, left-dislocation, to cite some ; (3) they can
passivize in both transitive and intransitive clauses. With regard to
advancement, the data from the languages considered here have
sufficiently demonstrated that 3 to 2 advancement or Loc to 3 to 2 to 1
advancement is a questionable matter in these languages. If such an
advancement were operative in these languages, it would have indicated
that due to the Stratal Uniqueness Law, an initial 2 for example loses
its 2-relation to the predicate when a 3 passivizes. In other words,
for a 3 to passivize, it must, according to RG, advance first to 2 before
advancing to 1 and consequently, the initial 2 must be put en chômage
and bear the chômeur-relation to the predicate. However, this does not
seem to be the case at least for the languages considered here. The
direct passivization of TERMS or Locatives explains why this is not so.
The facts discussed here show that there is an imperious need in RG to
modify the scope of the notion of TERM and the proposed Laws to accomodate
the data presented in this paper and elsewhere in the Bantu literature.

NOTES

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[1]Although there are generally two noun prefixes, one singular and the
other plural, some nouns, however, do not show a singular/plural alternation.
e.g. (a) nzubu u-di   mu-nene
         house Ag-is Ag-big (The house is small)

     (b) nzubu i- di mi-nene
         house Ag-are Ag-big (The houses are big)

It is only through the subject-verb agreement that one can tell that nzubu
(house) in (a) is singular and that in (b), it is in plural (cf. Table 1 for
SVA prefix in Tshiluba).

[2]Generally speaking, Tshiluba phonology requires that l's become n
in intervocalic position, V_1-----V_2, when V_1 is preceded by a nasal. Thus,
ku-kum-il-a (to beat for) in (3)b surfaces as ku-kum-in-a.

[3]In RG, it is customary to use numbers such as 1, 2 and 3 respectively
to refer to SUBJECT, DIRECT OBJECT and INDIRECT OBJECT. Similarly, 1-hood,

2-hood and 3-hood refer, by analogy, to subject, direct object and indirect object respectively.

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HOW DO TENSE AND ASPECT INTERACT IN DETERMINATION OF VERB FORMS?
VERB PAST FORMS AND NON-PAST FORMS IN JAPANESE `WHEN'-CLAUSES

Tsuneko Nakazawa

A Japanese relative clause and a noun toki `time', which
syntactically behaves as the head noun of the relative clause,
constitute a subordinate clause, in effect equivalent to the
English `when'-clause. In toki-clause, however, the verb forms,
non-past ru-form and past ta-form, do not directly reflect the
time that the action referred to by the verb occurred. The
present paper describes the determination of verb forms in toki-
clauses in relation to the verb form in the matrix clause. Both
the concepts of "aspect" and "tense", as well as subcategorization
of verbs, are necessary to clarify the determination of the
subordinate verb forms.

Different authors have asserted repeatedly that the two verb
forms are interchangeable in toki-clauses without resulting in
different semantic readings if the verb is a stative verb.
However, it will be shown that the verb forms are not always
interchangeable even if the verb is a stative verb, while the
interchange of non-stative verb forms is also possible if certain
conditions are satisfied.

The present paper claims that both the ru-form and the
ta-form can be used in the toki-clause when (1) the entire
sentence indicates a past event, and (2) the action (or state)
indicated by the verb in the toki-clause takes place at the same
time as that of the verb in the matrix clause. That is, when the
actions indicated by the toki-clause and the matrix clause take
place simultaneously, both the ru-form as an indication of
incompletive aspect and the ta-form as an indication of past tense
are possible in the toki-clause, regardless of whether the verb is
stative or not.

I. DEFINITION OF TERMS

I-A. RU/TA-FORM

The term "verb form" is used in this paper simply to mean either
the ru-form or the ta-form of a verb and does not presuppose any
one-to-one correspondence between the verb form and the present/past
tense indicated by the verb.

I-B. PAST/NON-PAST TENSE

"Tense relates the time of the situation referred to to some other
time, usually to the moment of speaking." (Comrie 1976:1) That is,
tense denotes a temporal relation between the time referred by the verb
and the time when the utterence is made.

In a simplex sentence, the ta-form indicates a time prior to the speech act, i.e. past tense or [+past], while the ru-form indicates a time simultaneous with or later than the speech act, present/future tense or [-past].

In a complex sentence such as a sentence with a toki-clause embedded, the tense of the entire sentence is determined by the verb form in the matrix clause.

    (1) Taro wa daigaku ni hair-ru toki kuruma o kaw-ta.
                college   enter   when car   bought
      When Taro was about to enter college, he bought a car.

    (2) Taro wa daigaku ni hair-ta toki kuruma o kaw-ta.
                            entered
      When Taro entered college, he bought a car.

In (1) and (2), regardless of the ru- or the ta-form of the embedded verbs, the sentences indicate past events, [+past], due to the ta-form of the matrix verb, and both entering college and buying a car take place prior to the speech act.

On the other hand, (3) and (4) indicate future events, [-past], and at the point of speech Taro had neither entered college nor bought a car.

    (3) Taro wa daigaku ni hair-ru toki kuruma o kaw-ru.
                                            buy
      When Taro is about to enter college, he will buy a car.

    (4) Taro wa daigaku ni hair-ta toki kuruma o kaw-ru.

      When Taro enters college, he will buy a car.

I-C. COMPLETE/INCOMPLETE ASPECT

In examples (1)-(4), the ru/ta-forms of the embedded verbs do not indicate tense in relation to the speech act. They show the aspectual relation with the time referred to by the matrix verb.

The ru-form of a verb in a toki-clause indicates that the action of the embedded verb is incomplete, or [-complete], at the time of the action referred to by the matrix verb as in (1) and (3), while the ta-form indicates that the action of the embedded verb takes place prior to, and is complete, or [+complete], at the time of the action referred to by the matrix verb as in (2) and (4). That is, in toki-clause the temporal reference point of the verb generally shifts from the time of the speech act to the time referred to by the matrix verb.

II. EMBEDDED VERB FORM AND ASPECT: LITERATURE REVIEW

II-A. [-STATIVE] EMBEDDED VERB

In the literature to date, cases like the above examples (1)-(4) are the least problematic. When the ru-form is used in a toki-clause, the action of the embedded verb (EV) has to take place after the action of the matrix verb (MV), and the action referred to by the ta-form in a toki-clause has to take place before the action of the matrix verb. Good examples of this are given by Josephs, cited by Kuno. (1973:266)

(5) John wa basu o ori-ru toki niwa itumo tyuui-su-ta.   EV<-MV
     bus   get-off   always careful-was
   When John was about to get off a bus, he was always careful.

(6) John wa basu o ori-ta toki niwa itumo tyuui-su-ta.   EV->MV
       got-off
   When John had gotten off a bus, he was always careful.

(7) John wa basu o ori-ru toki niwa itumo tyuui-su-ru.   EV<-MV
              careful-is
   When John is about to get off a bus, he is always careful.

(8) John wa basu o ori-ta toki niwa itumo tyuui-su-ru.   EV->MV

   When John has gotten off a bus, he is always careful.

The arrow between EV and MV indicates the temporal relation between the times referred to by EV and MV by pointing to the verb that refers to the later action.

Many authors claim that when actions of EV and MV are considered to take place simultaneously, the ta-form must be used for EV while the ru-form cannot be used. Soga (1983:72), for example, gives the following sentence as an example of simultaneous actions:

(9) Kinou   sakana o kaw-ta toki depaato   e ik-ta.   EV=MV
   yesterday fish   bought   department
             store
   When I bought fish yesterday, I went to a department store (lit.).

The equal sign between EV and MV indicates the simultaneous occurrence of actions referred to by EV and MV.

Kuno (1973:268-269) also makes the same conclusion that the ta-form of EV "represents a past action simultaneous with, or prior to, the action represented by the main clause predicate", while the ru-form indicates only "future with respect to the time referred to by the main clause predicate", without giving a specific example for "simultaneous" case. I personally do not see how Soga's example (9) can represent the simultaneous occurrence of EV and MV, but in either case this generalization is proved to be false in the following sections.

II-B. [+STATIVE] EMBEDDED VERB

There are, however, more problematic cases where both the ru-form
and ta-form in a toki-clause are used "interchangeably" without
changing semantic readings. Soga (1983:71) gives examples:

(10) Kyonen   Yokohama ni i-ru toki Tanaka-san ni aw-ta. EV=MV
     last year   am   met
     When I was in Yokohama last year, I met Mr. Tanaka.

(11) Kyonen Yokohama ni i-ta toki Tanaka-san ni aw-ta.   EV=MV
                             was
     When I was in Yokohama last year, I met Mr. Tanaka.

Soga (1983) and Kuno (1973) (though Kuno is dealing with a relative
clause in general) attributes this interchangeability to the semantic
subcategorization of verbs: i.e. the verb forms are interchangeable in
case of stative verbs but they are not interchangeable in case of
action verbs. Verbs, or more generally "verbals" to include adjectives
and copulas, with a semantic feature [+stative] indicate a state and
what is referred to by those verbs has some duration of time, while
[-stative] verbs are so-called action verbs and indicate actions or
events. When EV in a toki-clause is [+stative], the ru-form and
ta-form can be interchanged.

However, this interchangeability is canceled when MV has the
ru-form.

(12) Waka-i toki niwa okane ga na-katta.   EV=MV
     young-am   money   had-not
     When I was young, I did not have money.

(13) Waka-katta toki niwa okane ga na-katta.   EV=MV
     young-was
     When I was young, I did not have money.

(14) Waka-i toki niwa okane ga na-i mono des-u.   EV=MV
                                    usual-is
     When people are young, they usually do not have money.

(15)*Waka-katta toki niwa okane ga na-i mono des-u.

     When people are young, they usually do not have money.

In the above examples, the ru- and the ta-forms of EV in (12) and (13)
are interchangeable but, with the ru-form for MV, the ru-form cannot
interchanged with the ta-form and hence (15) is ungrammatical.

To summarize the existing literature, the following rules can be
given:

```
                                                                Examples
If EV is [-stative], EV with ru-form indicates EV<-MV          1,3,5,7
                            ta-form         EV->MV or          2,4,6,8
                                            EV=MV.             9

If EV is [+stative] and if MV is [-past],
                EV with ru-form indicates EV=MV.              14

If EV is [+stative] and if MV is [+past],
                EV with ru-form indicates EV=MV              10,12
                            ta-form indicates EV=MV.         11,13
```

These rules, in spite of their complexity, do not tell what will happen
when [+stative] EV takes the ta-form with [-past] MV, or if such a case
is possible.

III. EMBEDDED VERB FORM AND ASPECT: ANALYSIS

III-A. [+STATIVE] EMBEDDED VERB

To account for the interchangeability of the ru-form and the
ta-form of [+stative] EV, Soga (1983:73) gives an explanation:

> One reason for this phenomenon may be that the stative verbs are
> aspectually "imperfective" and "incompletive" regardless of their
> tense forms. Since their ru-form is also imperfective and
> incompletive, there is no aspectual distinction between their ta-
> and ru-forms.

If this were true, not all of the behavior of stative verbs would be
accounted for.

First, if the ru-form and the ta-form of [+stative] EV were
equally [-complete], and if that were the reason for their
interchangeability, then why is the interchange not possible when MV
takes the ru-form?

Second, there are cases where [+stative] EV does not indicate a
simultaneous state with MV as in (16) and, not surprisingly, in such
cases the interchange between the ru- and the ta-forms is not possible.

(16) Gobi-sabaku dewa hiru   atu-katta toki niwa   EV->MV
     the Gobi   daytime hot-was
     When it had been hot in the daytime at the Gobi,

     yoku hosi ga matataite mieta.
     often stars   twinkling viewed-were
     the stars were often twinkling

(17)*Gobi-sabaku dewa hiru atu-i toki niwa
                               hot-is
    When it was not in the daytime at the Gobi,

    yoku hosi ga matataite mieta.

    the stars were often twinkling.

(17) is ungrammatical unless what is meant is "The stars can be seen in the daytime."

    Third, there are cases where [+stative] EV takes the ta-form and MV takes the ru-form.

(18) Byouki no toki ni undou-su-ite wa ikenai.   EV=MV
     sick-are   exercise-do   must-not
     When you are sick, you must not do exercise.

(19) Byouki datta toki ni sugu undou o hazimete wa ikenai.EV->MV
     sick-were   right-away   start
     When you have been sick, you must not start doing exercise right away.

As shown in (18) and (19), the replacement of the EV forms results in different meanings.

    The interchangeability between the ru-form and the ta-form of [+stative] EV is not because of the stativeness of EV but rather the simultaneous occurrence of the state referred to by EV and the action of MV. Therefore, even if EV is [+stative], it cannot take the ru-form to indicate the state completed prior to the action of MV as shown in (16) and (17). (18) and (19) show that the interchangeability should also be attributed to the ta-form of MV, which indicates that the entire sentence refers to the past event.

III-B. [-STATIVE] EMBEDDED VERB

    According to the rules in Section II, the ru-form and the ta-form of [-stative] EV always result in a different temporal sequence of EV and MV. However, there are cases where the ru-form and the ta-form can be interchanged equally indicating the simultaneous occurrence of actions of EV and MV.

(20) Kinou   peipaa no zyunbi   o su-ru toki   EV=MV
     yesterday paper   preparation   do
     When I prepared for the paper yesterday,

     koohii o nom-ta.
     coffee   drank
     I drank coffee.

(21) Kinou peipaa no zyunbi o su-ta toki koohii o nom-ta. EV=MV
             did   EV->MV
When I prepared for the paper yesterday, I drank coffee.

(22) Nihon-ryouri o tabe-ru toki hasi   o tukaw-ta. EV=MV
Japanese food   eat   chopsticks used
when I ate Japanese food, I used chopsticks.

(23) Nihon-ryouri o tabe-ta toki hasi o tukaw-ta.   EV=MV
             ate   EV->MV
When I ate Japanese food, I used chopsticks.

Evidently, the interchange between the ru-form and ta-form is possible
to express the temporal sequence EV=MV even if the EV is [-stative],
though (21) and (23) are ambiguous. (21) and (23) could also mean
EV->MV as the result of the completive aspect of ta-form.

   In these examples, zyunbi o su-ru and tabe-ru are action verbs
and, at the same time, "durative verbs".

   Semantically, durative verbs (keizoku dousi) express the meaning of
actions, events or processes which are perceived to require a certain
amount of appreciable time from the inception to the termination. On
the other hand, punctual verbs (syunkan dousi) are conceived not to
require such a time. (Soga 1983:107, parentheses added)

This semantic feature of verbs, [+durative], is a sub-subcategory of
[-stative] verbs. Therefore, verbs are either [+stative] or [-stative]
and, furthermore, [-stative] verbs are either [+durative] or
[-durative].

   In case EV is [-stative, +durative], the interchange of the
ru-form and the ta-form is possible. If MV takes the ru-form, however,
the ru-form and the ta-form of [-stative, +durative] EV result in
different meanings as is the case of [+stative] EV with [-past] MV.
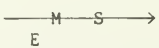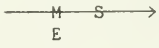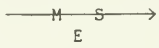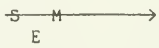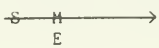
(24) Peipaa no zyunbi o su-ru toki wa itumo koohii o nom-ru. EV=MV
                                    always
When I prepare for papers, I always drink coffee.

(25) Peipaa no zyunbi o su-ta toki wa itumo koohii o nom-ru. EV->MV

When I have prepared for papers, I always drink coffee.

IV. CONCLUSION

   To account for all the counterexamples in the previous section,
the rules given in Section II must be modified as follows:

```
                                                                    Examples
If EV is [-stative   , EV with ru-form indicates EV<-MV           1,3,5,7
          -durative]

                       EV with ta-form indicates EV->MV.          2,4,6,8

If EV is [-stative   and if MV is [-past],
          +durative]

                       EV with ru-form indicates EV<-MV or        24
                                                   EV=MV          24
                       EV with ta-form indicates EV->MV.          25

If EV is [-stative   and if MV is [+past],
          +durative]

                       EV with ru-form indicates EV<-MV or        20
                                                   EV=MV          20,22
                       EV with ta-form indicates EV->MV or        21
                                                   EV=MV.         21,23

If EV is [+stative]  and if MV is [-past],
                       EV with ru-form indicates EV=MV            14,18
                       EV with ta-form indicates EV->MV.          19

If EV is [+stative]  and if MV is [+past],
                       EV with ru-form indicates EV=MV            10,12
                       EV with ta-form indicates EV->MV or        16
                                                   EV=MV.         11,13
```

These rules look even more incomprehensible than the previous set of rules. To clarify the relation between the EV forms and the temporal sequence of MV and EV, see the following diagram, where an interesting generalization emerges: When and only when, the events expressed by MV and EV overlap on the temporal scale, EV has an option of taking either the ru- or ta-form regardless of whether it is [+stative] or [-stative].

```
                    Tense & Aspect of EV                          Form of EV

   case(1) -stative +past    +durative      ——M——S——→   ta-form
                    +complete               E

   case(2) -stative +past    +durative      ——M——S——→   ta-form or
                    -complete               E                     ru-form

   case(3) -stative +past    -durative      ——M——S——→   ru-form
                    -complete                 E

   case(4) -stative -past    +durative      S——M————→   ta-form
                    +complete               E

   case(5) -stative -past    +durative      S——M————→   ru-form
                    -complete               E
```

case(6)	-stative	-past -complete	-durative	S̶ M̶ → E	→	ru-form
case(7)	+stative	+past +complete		─── M̶ S̶ → EEE	→	ta-form
case(8)	+stative	+past -complete		─── M̶ S̶ → EEE	→	ta-form or ru-form
case(9)	+stative	-past +complete		S̶ M̶ → EEE	→	ta-form
case(10)	+stative	-past -complete		S̶ M̶ → EEE	→	ru-form

```
-> flow of time
S   point of speech act
M   event referred to by MV
E   event referred to by EV
```

What happens then, is a shift of a speaker's viewpoint. The tense [±past] of a verb requires its reference point to be at the time of the speech act, while the aspect [±complete] requires the reference point to be at the time referred to by MV. When MV and EV overlap on the temporal scale, as in cases (2) and (8), EV can take either the temporal reference point [+past], in which case EV takes the ta-form, or the aspectual reference point [-complete], in which case, the ru-form. This also explains why the option of the ta-form for EV is not available in case (9) although MV and EV overlap on the temporal scale. This is because both the temporal reference point [-past] and the aspectual reference point [-complete] requires the EV form to have the ru-form.

The diagram also explains why examples (21) and (23) are ambiguous. [-stative] EV with the ta-form in (21) and (23) can represent either case (1) or (2). In summary, the general rules for determining the verb form in a toki-clause are:

Rule 1. If what is referred to by EV takes place simultaneously with what is referred to by MV, that is, EV is [-complete], and if the entire sentence refers to a past event, that is, MV takes the ta-form, then EV can take either the ru-form or the ta-form. (When EV is a [-durative] verb, its semantic property inherently does not allow the EV to express a simultaneous event with what is referred by MV.)

Rule 2. Otherwise, what is referred to by EV takes place after that of MV, that is, EV is [-complete], then EV takes the ru-form.

Rule 3. Otherwise, EV takes the ta-form.

These rules point out an important generalization which the previous
rules in Section II lack. That is, the EV forms are determined in
terms of the temporal sequence of actions referred to by EV and MV, and
not in terms of a particular kind of EV. Even if EV is a stative verb,
the interchange of the two forms is not possible if the state referred
to is [+complete] at the point of action of MV, while even if EV is an
action verb, it is possible to interchange the verb forms if the action
of EV is [-complete] at the point of action of MV.

V. FOR FURTHER STUDY

V-A. "INTERCHANGEABILITY"

So far, the phrase "interchangeable without changing the meaning"
has been used in a rough sense, but strictly all this means is that
"the replacement of verb forms does not change the temporal sequence of
EV and MV". It would be much more reasonable to assume that there are
some semantic differences between [+past, -complete] EV with the
ru-form and with the ta-form.

The difference between the ru-form and the ta-form is in the
temporal reference point. In (26) the reference point is the time when
the book was taken away and in (27) the reference point is when the
sentence was uttered. Therefore, (26) carries Taro's viewpoint, and
possibly a subjective connotation, while (27) carries the speaker's
viewpoint, and a more objective connotation.

    (26) Taro wa hon o yonde-i-ru toki   EV=MV
                book reading-is
         When Taro was reading a book,

         sore o Hanako ni toriage-rare-ta.
         it   taken-away-was
         he had it taken away by Hanako.

    (27) Taro wa hon o yonde-i-ta toki   EV=MV
                     reading-was
         When Taro was reading a book,

         sore o Hanako ni toriage-rare-ta.

         he had it taken away by Hanako.

Since the interchange of the verb forms is a result of a shift of a
speaker's view point, the above observation is not surprising. The
ru-form shows the view point of the subject of the sentence and
describes the event as it is taking place, while the ta-form shows that
of the speaker of the sentence and describes the past event.

Another difference is that the ta-form of a stative verb carries
the connotation that the state no longer exists at the time of the

speech act. This, of course, is a result of the completive aspect of the ta-form.

(28) Yamada wa isya o site-i-ru toki kimyouna kanzya o mi-ta. EV=MV
　　　 doctor doing-is　　　 strange patient saw
　　When Yamada was a doctor, he saw a strange patient.

(29) Yamada wa isya o site-i-ta toki kimyouna kanzya o mi-ta. EV=MV
　　　　　　 doing-was
　　When Yamada was a doctor, he saw a strange patient.

It is natural that (29) has a stronger connotation that Yamada was not a doctor any longer when the sentence was uttered since the ta-form of EV is chosen to state the toki-clause as something [+past] while the ru-form emphsizes the toki-clause as [-complete] in (28).

It follows from the above generalization that, when a toki-clause includes an adverb which refers to past time, the ta-form is used more often since such an adverb shares the feature [+past] rether than [-complete]. This phenomenon was first stated by Josephs (1971) as an obligatory choice of a verb form in a relative clause in general, but as far as a toki-clause is concerned, the ta-form with such an adverb is not obligatory.

(30) Taro wa Hanako ga kinou　　　 benkyou site-i-ru toki　　 EV=MV
　　　　　　　 yesterday study　 doing-is
　　When Hanako was studying yesterday,

　　sore o soba de mite-i-ta.
　　it　　 nearby　 watching-was
　　Taro was watching her nearby.

None of the factors above obligatorily determines the form of [+past, -complete] EV. It will be interesting to find out more about the factors that trigger a specific form.

V-B. EMBEDDED VERB FORM AND ASPECT IN WIDER SCOPE

This work deals with a small portion of the relationship between embedded verb forms and their aspects. A toki-clause is a special case of a relative clause, and there is a closed set of other head nouns that do not leave a gap in the relative clause as their trace, such as tokoro `place/time', baai `case', koto `thing (nominalizer)', no `thing (nominalizer)', nioi `smell', oto `sound' and koe `voice'. Moreover, subordinate structures that are marked by nara `if', tara `if', ba `if', to `if', nagara `while' or the te preverval-form of a verb seem to indicate aspect rather than tense. The diagram given in the previous section lacks the following case even though it should be possible semantically:

EV [+stative, -past, -complete]   —S——M——→
                                          EEE

This case cannot be expressed by means of a toki-clause.

(31)*Tugino hi tenki ga waru-i toki   EV<-MV
     next   day weather bad-is
     When the weather is going to be bad on next day,

     watasi wa hana ni mizu o yar-na-i.
     I   flower water   give-not
     I do not water plants.

(32)*Tugino hi tenki ga waru-katta toki   EV<-MV
                        bad-was
     When the weather is going to be bad on next day,

     watasi wa hana ni mizu o yar-na-i.

     I do not water plants.

Rather,

     (33) Tugino hi tenki ga waru-i nara watasi wa hana ni mizu o yar-na-i.
                                  if
          If the weather is going to be bad on next day, I do not water plants.

     Some of the subordinate-clause markers morphologically require a
specific verb form, while some can take either the ru-form or ta-form.
Further study is needed t extend or modify the rules for the
toki-clause in order to capture the more general nature of aspect in
Japanese.

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PARTITIVE CONSTRUCTIONS, UNACCUSATIVITY AND ERGATIVITY

Jon Ortiz de Urbina

The purpose of this article is to provide an analysis of
some partitive constructions (-rik constructions in Basque,
genitive of negation in Russian), as an alternative to Pesetsky's
(1982) ECP account. After reviewing some of the characteristics
of these constructions and presenting Pesetsky's analysis, I will
point out some of its problems. I will try to show that a
condition on the structural relation between partitive phrases
and the elements that define the domain where such phrases can
appear (especially sentential negation, on which I will
concentrate in this article, but also yes/no questions and other
less easily characterizable environments) accounts for the same
distributional properties of partitive phrases as the alternative
analysis does, while eliminating the problems related with it.1

The analysis of partitive phrases in a language like Basque, with
morphological ergativity, is important in that it bears directly on the
syntactic ergativity or accusativity of the language. Nominal phrases
marked with the partitive case ending -rik may appear in the same contexts
as phrases marked by the absolutive ending: subjects of intransitive verbs
conjugated with the auxiliary izan 'to be' (1i), and objects of transitive
verbs conjugated with the auxiliary ukan 'to have' (1ii). As shown in
(1iii), partitive phrases cannot appear as subjects of transitive clauses,
where ergative marking is obligatory:

(1) i. Gizon-ik ez da etorri
       man-part neg has come
       'No man has come'

   ii. Ez nuen gizon-ik ikusi herri-ko kale-etan
       neg ukan man-part see   town-of street-in
       'I did not see any man in the streets of the village'

  iii.*Gizon-ik ez zuen saio-a   ikusi
       man-part neg ukan performance-Abs see
       'No man saw the performance'

Since the asymmetry in distribution is not dependent on the subject/ object
asymmetry, but rather on the absolutive/ergative distinction, one might
claim that partitive phrases provide some evidence that Basque shows
syntactic constructions based on ergative relations. On the other hand, an
alternative explanation that maintains the non- ergative status of Basque
syntax is possible. Levin (1983) has shown that the class of verbs
selecting the izan 'to be' auxiliary is only a subset of the class of
semantically intransitive monadic predicates, in particular, that only
unaccusative verbs (in Perlmutter's (1976) terminology) belong to that
class. It can be added as confirming evidence that unergative predicates
are in fact conjugated with the transitive auxiliary ukan 'to have', their
arguments appearing in the ergative case. Thus, verbs like argitu 'to
shine', erausi 'to murmur', or kurritu 'to run' take only ergative
subjects. Another sizable class of unergative predicates are expressed by
[NP EGIN] phrases, treating them as particular cases of the two place

predicate <u>egin</u> ´to do´: <u>lan egin</u> ´to work, to do work´, <u>hitz egin</u> ´to talk,
to do word´, <u>negar egin</u> ´to cry, to do cry´, etc. Then, following Burzio´s
(1981) GB rendering of Perlmutter´s unaccusative hypothesis, <u>izan</u> ´to be´
selecting unaccusative predicates would take D-object arguments while <u>ukan</u>
´to have´ predicates would take a D-subject only if unergative and both
subject and object if transitive. In this analysis the asymmetry in (1) is
a subject/object asymmetry: partitive phrases are possible in D-objects of
unaccusative verbs (1i), D-objects of transitive verbs (1ii), but not
subjects of transitives (1iii).

The partitive construction in Basque corresponds rather closely to
some quantificational constructions in other clearly accusative languages,
like French <u>pas de</u> partitives (Kayne 1981) and Russian genitive of negation
(Pesetsky 1.982). As discussed by Pesetsky, in clauses with sentential
(pre-verbal) negation Russian allows genitive nominals corresponding to
objects of transitive verbs (2i) and subjects of intransitive verbs (2ii),
but never subjects of transitive verbs (2iii), as shown in the following
sentences:

    (2) i. Ja ne polučal pis´ma
        I neg received letter-acc. pl.
        Ja ne polučal pisem
                letter-gen. pl.
        ´I did not receive letter/any letters´

     ii. Nikakie dokladčiki ne pojovilis´
         no speaker-nom. pl neg showed up-pl.
         Nikakix dokladčikov ne pojavilos´
                 gen.pl. neg   -net.sg.
         ´None of the speakers/No speaker showed up´

    iii. Studenty ne smotrjat televizor
         nom. pl.   watch-pl.
       *Studentov ne smotrit televizor
        gen.pl.   -sg.
       ´The students/*Not one student watched T.V.´

Not all intransitive predicate subjects can appear in the genitive,
however. As Pesetsky shows, a restriction applies to the effect that no
genitive can correspond to the agentive subject of an intransitive verb.
Sentence (ii) above, whose subject bears the theme theta-role, contrasts
with (3), where the predicate assigns the agent theta-role to the subject,
ruling out the genitive construction as ungrammatical: one place predicates
with agent arguments fall under the unergative, rather than the unaccusat-
ive class, and therefore agent intransitive arguments are ungrammatical
when they appear in this partitive construction:

    (3) i. Takie sobaki   ne kusajutsja
        such dog-nom.pl. neg bite-pl.

     ii.*Takix sobax   ne kusaetsja
               -gen.pl. neg bite-sg.
       ´Such dogs/*No such dogs bite´

If theme theta-role predicates are analyzed as unaccusative verbs with a

single D-structure object argument, an explanation for the construction can be supplied based on the descriptive statement that such genitives may appear only in D-structure object position. S-subjects corresponding to D-structure subjects will be ruled out. The same generalization would be available for Basque if verbs selecting izan auxiliary are syntactically unaccusative, that is, if they only theta mark an argument in D-object position. In this case, partitive nominals may appear in D-structure object position.

In addition to sentential negation, this type of partitive may also appear in other contexts like the yes/no interrogative clause below, which show the same distribution as their counterparts in negative contexts in (1):

(4) i. Arrain-ik ikusi duzu   ibai honetan?
     fish-part see   aux-ukan river this-in
     ´Have you seen any fish in this river?´

  ii. Gizon-ik atera al da   etxe horretatik?
      man-part go out Q aux-izan house that-from
      ´Has any man come out from that house?´

  iii.*Pertsona-rik ulertu   du   nere azalpena?
       person-part understand aux-ukan my   explanation
       ´Has any person understood my explanation?´

Morphologically the partitive case has one single indefinite form, as opposed to the other cases, which show singular, plural and indefinite forms. Since there is no absolutive noun in these sentences, the auxiliary will take the unmarked third person singular form of the absolutive marker as it takes the third person singular form in the Russian examples shown above.

Semantically sentences with partitive -rik differ from their counterparts with absolutive nominals in that the former, but not the latter, are given an indefinite quantification interpretation, both in negative and interrogative contexts. Similar to any phrases in English, the type of quantifier involved seems to vary between universal and existential the latter being common in negative and interrogative contexts. Thus, the interpretation of sentences (1i,ii) above, with the negative quantifier, would be something like (5) and (6):

(5) $\neg \exists$ x, x man, I saw x   (=1iii)

(6) $\neg \exists$ x, x man, x come   (=1i)

Negation has always scope over the existential quantifier in these sentences. Similarly, in interrogative contexts like those in sentences (4), the existential quantifier seems to be required in their interpretation. Corresponding to (4i,ii) we have the following:

(7) ? $\exists$ x, x fish, you have seen x in this river (=4i)

(8) ? $\exists$ x, x man, x has come out from that house (=4ii)

However, a universal reading occurs in other contexts where partitives may be used, including "affective predicate" complements and superlative phrases:

(9) Ijito-rik   hor   bizi-tzea zoroa iruditzen zait
    gipsy-part there live-NOM crazy seem   aux
    'It seems to me crazy for (any) gipsy to live there'

(10) Hau-xe   duk estilo-rik aurreratu-en-a
     this-emp have style-part advanced-sup-Abs
     'This is the most advanced style'

Their interpretation is shown in the following representations:

(11) $\forall$ x, x gipsy, x to live there...

(12) $\forall$ x, x style, more (this advanced than x)

As discussed above, only patient/theme arguments will occur in this construction with intransitive verbs, since only monadic verbs taking patient arguments select the izan auxiliary and hence surface as absolutive subjects, to which partitive nominals can correspond.

Pesetsky´s analysis tries to provide an explanation based on the ECP Principle. Noting that certain Russian quantifiers govern genitive case, he analyzes the genitive phrase as including an empty quantifier which is the head of the phrase, following the analysis of Kayne (1981). After application of Quantifier Raising to the quantifier phrase in object position, we get an LF representation like (13):2

(13) [QP   [NP   INFL [V [e]   ]]]
     S´   i S   i

where the trace -A-bound by the quantifer adjoined to S is properly governed by V. However, movement out of the subject position is also allowed by ECP. In (14)

(14) [QP   [[e]   INFL   VP]]
     S´   i S   i

the subject trace is properly governed by the binder in adjunction position. If QP is not a proper binder here, the structure with subject QP´s would be ruled out as desired. To achieve this effect, his analysis is based on the assumptions that categorial selection (c-selection) is independent from theta-selection and that trace theory can be independently derived from other principles of UG without any specification. As a consequence of his first assumption, if the Projection Principle refers only to theta-role sub- categorization but not to c-selection, although at D-structure we will have a representation of the theta-role subcategorization frame of any verb, the constituents to which the theta-roles are assigned need not be of the category specified in the verb´s categorial selection information. It is only at LF that these complements of particular categories have to be present (and by the Projection Principle, the theta-roles assigned to them). By the second assumption, it follows that gaps are freely indexed with any constituent, whether sharing its category

feature or not. Independent principles will rule out most cases produced by
this free gap-indexing mechanism. Assuming then that nothing prevents an
empty category x from being coindexed with a c-commanding phrase of
category y, we can therefore co-index a QP with a gap [e] of category NP
rather than QP. In this case, if we assume that proper binding is defined
as in (15), incorporating condition (iii),

(15) a properly binds b iff
     i. a and b are coindexed
     ii. a c-commands b
     iii. a is a possible antecedent of b

where for a to be a possible antecedent of b they must share number, gender
and categorial features, then QP would not be a proper binder of the trace,
since, as they have distinct categorial features, QP is not a possible
antecedent of [np e]. Then QP in -A-position after adjunction does not
properly bind the trace, the latter violating the ECP Principle. At LF,
c-selection of the verb is met since the traces are NP's, although at D-
structure, before QR has applied, c-selection is not (and need not be) met
by the QP.

The same analysis involving an empty quantifier is motivated for
Basque. Although the use of partitive -rik with overt quantifiers is
diminishing, it is still possible, as shown in phrases like

(16) i. Eskerr-ik   asko
     thank-part many
     'Thank you / Many thanks'

    ii. Hizkuntza-rik gehien-ak
     language-part most-Abs pl
     'Most languages'

The presence of an empty quantifier requiring partitive Case of the
quantified element can therefore be justified for Basque as for other
languages (Franch, Russian) where the analysis has been proposed.3 After
Quantifier Raising applies, the quantifier phrase adjoined to the clausal
node is not a possible antecedent and the trace is not properly governed in
subject position, while object positions of both polyadic ukan verbs and
monadic unaccusative verbs will be always properly governed by the verb and
QR will apply without any ECP violation being involved.

There are some problems with the analysis, however. If partitive
phrases are like any other quantifier phrase, we should expect to find the
same types of scope ambiguities in clauses with more than one quantifier.
Thus, in the following sentence, either quantifer may be interpreted as
having wide scope over the other, allowing the two LF structures after QR:

(17) Alkimista guzti-ek hiru sustantzia erabiltzen zuten
     alchemist all-E pl three substance use   aux
     'All of the alchemists used three substances'

　　　　i. all x, x alchemist, three y, y substance, x used y
　　　　ii. three x, x substance, all y, y alchemist, y used x

On the other hand, there is one single reading for a sentence with two
quantifiers, if one of them is the partitive phrase. For sentence (18) the
only interpretation is as shown, with wide scope of the universal
quantifier over the partitive:

　　(18) Alkimista guzti-ek lortu al zuten urre-rik?
　　　　　　　　　all-E pl get　Q　aux　gold-part
　　　　　´Did all of the alchemists get any gold?

　　　　?, for all x, x alchemist, x got gold

The same situation obtains with the negative operator, both in Basque and
in Russian. For a sentence with sentential negation and a quantifier, like
(19), we have the intepretations shown:

　　(19) a. Ez　ziren lau　ikasle　klase-ra etorri
　　　　　　　neg aux　four student class-to come
　　　　　　´Four students did not come to class´

　　　　　b. i. not, x=four students, x come to class
　　　　　　　ii. x=four students, not, x come to class

In (i) negation has wide scope over the quantifier, and the interpretation
is that it was not the case that four students came to class (ten came
instead); in (ii), with the quantifier having scope over negation, the
interpretation would be that ´for four students, it is not the case that
they came to class (they went to the cinema instead)´. On the other hand,
the only interpretation of a sentence with both negation and partitive,
like the ones in (1i,ii) is the one shown in (4) and (5), with wide scope
of negation over the partitive. In addition to this problem, this analysis
seems to make the wrong predictions with respect to the variable left
behind by the movement of the partitive phrase at LF. If QR actually
applies to these phrases creating an operator- variable chain at LF, the
variable should display the same type of properties of other variables at
that level. In particular, it should obey general principles like the
Bijection Principle, which has among its consequences that operators cannot
bind more than one variable. It is then predicted that application of QR to
partitive phrases will leave behind a trace with the same coindexing
properties as traces in cross- over structures. Thus, in (20i), the phrase
gizon gazterik ´any young man/young men´ should not be interpretable as
coreferential with the pronoun berak ´he´, since at LF the operator will
bind both the trace and the pronoun, violating the Bijection Principle. But
this principle holds for other Basque operator-variable relations, as shown
in (20ii), where we have the quantifier phrase gizon asko ´many men´:

　　(20) i. Berak$_i$ maite duen lurra uzteak ez　du gizon gazterik$_i$ izutzen
　　　　　　he$_i$　　love　aux country leave neg aux man　young$_i$　　frighten
　　　　　　´To leave the country that he loves does not frighten any
　　　　　　young man´

ii.*Berak$_i$ maite duen lurra uzteak ez du gizon asko$_i$ izutzen
ʹTo leave the country that they love does not frighten many menʹ

In fact, the sentence is grammatical in the intended interpretation, indicating that the analysis is not adequate.4

The alternative analysis I would like to propose attempts to relate the two factors that seem to play a role in determining the distributional properties of partitive constructions: on the one hand their limitation to D-object environments, whether as transitive object NPʹs or as unaccusative subjects, and on the other hand, their limitation to certain negative and interrogative domains. The intuitive idea is that partitive phrases have to appear within the domain of certain elements to be interpretable as such. I will define ʹdomainʹ here as a type of asymmetric c-command relationship. Thus, partitive phrases will have to appear ʹunderʹ sanctioning elements. The relation between the negative particle and the partitive phrase, will have to be one of superiority, where I follow Chomskyʹs (1973) definition according to which A is superior to B iff A c-commands B and B does not c-command A. Then, the negative element will have to be superior to the partitive phrase. following standard assumptions in placing NEG in INFL, in an S-structure like (21)

(21) [Q$_i$ INFL [VP V Q$_i$]]

the subject quantifier is not within the domain of NEG in INFL and hence it can correspond to a partitive phrase. Then the basic asymmetry observed follows directly at this level: object partitives, but not subject partitives will be acceptable.

While Pesetskyʹs formulation crucially depends on the application of Move-alpha to generate operator bound variables on which the ECP account is based, the alternative presented here fares equally well with the movement and the non-movement analysis. However, if, as suggested by the evidence provided above, partitive phrases belong to a class of name-like quantifiers that according to Hornstein (1984) do not generate operator-variable structures at LF, partitive phrases will remain in their D-structure positions and only those within the domain of a negative element will be interpretable. The ECP account is not then applicable.

The relation between partitive and its licensing element will have to be checked at S-structure in this analysis. The reason is that if NEG is treated as an operator and moved at LF to account for scope rela- tions, any subject partitive would be positively sanctioned, since an operator adjoined to S is superior to the subject.5

Notice that the fact that negation has always scope over the quantifier in these constructions, which is left unexplained in the ECP analysis, follows as a particular case of the general relation between A and B. If partitives are not moved and scope relations are expressed in terms of c-command, as generally assumed, the negative operator will always c-command the partitive phrase in object position. If, on the other hand, a movement analysis of partitives is motivated, QR could apply in any order to either of the elements, generating both (22) and (23):

(22)
```
        S´
       / \
    NEG    S´
          / \
       PART   ...
```

(23)
```
        S´
       / \
    PART   S´
          / \
       NEG    ...
```
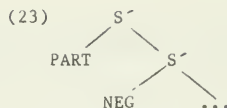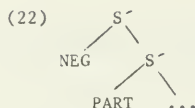
Only (22) would not violate the condition on asymmetric c-command. Hence, the wide scope relation of the negative element follows directly from the analysis. The effect is that the asymmetry is always preserved, a not uncommon situation. Thus Huang (1982) motivates an analysis of scope interpretation where if one quantification phrase or quantifier c-commands the other at S-structure, it must also c-command it at LF. The cases discussed above would be those where the c-command relation is not bi-unique, and the unidirectionality has to be preserved.

The present analysis relies on fewer assumptions than Pesetsky´s, while providing an explanation that is based on the relation between the partitive and the element that creates the semantic context for its appearance, a move that seems plausible. Even if all the above mentioned assumptions for the ECP analysis prove warranted, and ignoring the problems mentioned earlier, it cannot be claimed that on sinplicity grounds the ECP analysis involves less cost in that it follows from independent principles, since reference to semantic contexts ´licencing´ partitive constructions must be made in the ECP analysis as well.

Returning to the overall significance of these data to the analysis of Basque, it can then be concluded that morphological ergativity does not carry over to the syntax of Basque, since some apparently ergative based constructions can be shown to be explained in accusative terms, in ways parallel to other morphologically non-ergative languages.

NOTES

1 See deRijk (1972) for an exhaustive description of contexts where the partitive can be used in Basque.

2 Since the head of this phrase is an empty quantifier and the case filter applies to phonologically realized elements only, the quantifier phrase does not need to be moved to subject position to receive case, as other elements must in Burzio´s ergative verb analysis.

3 In fact, deRijk (1972) had already proposed an analysis based on empty quantifiers in Basque

4 Hornstein (1984) considers quantifiers like any in English as belonging to a name-like class that does not create operator-variable structures at LF.

5 This is not an implausible assumption. Other relationships like Kayne´s connectedness relation are also assumed to be checked at that level.

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KOREAN IRREGULAR VERBS AND NONLINEAR PHONOLOGY

Hyang-Sook Sohn

The irregular verbs of Korean under discussion exhibit
alternations between null and obstruents (/s/-irregular
verbs), r and t (/t/-irregular verbs), u, w, and p
(/p/-irregular verbs), ɨ and null (/ɨ/-irregular verbs), l
and null (/l/-irregular verbs), and lɨ and ll
(/lɨ/-irregular verbs). The alternation of the stem-final
segment before vowel-initial suffixes has interested Korean
phonologists, but there are still shortcomings in the
previous accounts. In this paper, I argue that the vertical
encoding of multi-level representation and the horizontal
encoding of cyclic expansion accounts for the deeper
phonological regularity of the irregular verbs, which would
otherwise not be captured. In nonlinear analysis, rules
apply to both regular and irregular verbs only if the
structural description is met, and no diacritic is needed to
differentiate these two types of verbs.

1. Introduction

    Korean has two classes of verbs: those whose stem-final segments show
alternations before some suffixes ("irregular verbs"), and those whose
stem-final segments do not show any alternations throughout the verbal
paradigm ("regular verbs"). The alternation of the stem-final segment
before vowel-initial suffixes in the irregular verbs has been of interest
to Korean phonological studies and linear analyses have been proposed to
account for it (Kim 1971, Kim-Renaud 1973, Lee 1976).

    The present analysis, however, provides a simpler and more insightful
account of these alternations by resorting to the recent developments of
the phonological theory: first, the nonlinear phonology allows phonological
rules to have a variety of reference by separating the concentrated
information in a single linear sequence into several levels and postulating
the skeleton and the melody as autonomous representations (Clements and
Keyser 1983, Harris 1983, and Levin 1984). Secondly, the lexical model of
the interaction between phonology and morphology (Mohanan 1981, Kiparsky
1982, 1983, and Pulleyblank 1983) allows phonology to have a more direct
access to morphology. A third theoretical assumption is the theory of
underspecification (Kiparsky 1982, 1984, Archangeli 1984). Assuming
underlyingly unspecified segments allows rules to be formulated in a
simpler way. These theoretical frameworks provide the phonological
component with an enriched source of phonological differentiation.

    In the next section, an outline of the theoretical framework assumed
in the present analysis is sketched. The following section provides an
overview of regular verbs to show that they show alternations which are not
restricted only to the verbal phonology of Korean. In the final section,
we discuss the alternations peculiar to the irregular verbs and argue that
they are best treated in terms of nonlinear phonological representations in

which irregular verbs are different from regular verbs.

2. A Sketch of the Theoretical Framework

In this section, I will briefly outline the major theoretical frameworks on which the analysis in the following sections are based. The essential assumptions concerning the syllable structure of Korean, underspecification of features, and the model of lexical phonology are discussed.

2.1. Syllable Structure

The analysis in this paper makes crucial reference to the skeletal tier and the syllable structure built on it. Following Levin (1984), the skeletal tier consists of a sequence of empty x slots which represent quasi-timing units. Each feature matrix in the segmental tier is categorially classified with [+N] or [-N]. In the underlying representation, however, only [+N] is specified. [+N] segments are obligatorily syllable nuclei. Even though a segment is unspecified with respect to the categorial component, it can be assigned the value [+N] if the segment is under the nucleus of a syllable.

(1) Nucleus [+N] Assignment

```
                    N
                    |
   [ ]  --->  [+N]/  x
                    |
                    __
```

Nucleus [+N] Assignment (1) applies to a newly created nucleus x slot which is derived by rule. Otherwise, [+N] is specified underlyingly. Otherwise, a feature matrix is assigned a default value [-N].

(2) Default [-N] Assignment
    [ ] ---> [-N]

The two rules (1) and (2) are intrinsically ordered by the Elsewhere Condition. Since the environment of rule (1) is more specific than that of (2) and the outputs are distinct, rule (1) applies prior to rule (2).

In Korean all the vowels except i and u are assigned [+N] underlyingly. All consonants and i and u are underlyingly unspecified with respect to the categorial feature. Consonants are assigned [-N] by Default rule (2). The two vowels i and u which alternate with glides y and w respectively are assigned [+N] by Nucleus [+N] Assignment (1) when they are dominated by the nucleus. Otherwise, they are assigned [-N] by rule (2), as consonants are.

The syllable structure built on the skeletal tier contains information on the categorial specification of each slot. The syllable structure of Korean can be roughly represented as (3).

(3)
```
              N"
             /|
            /N'
           /·\
          / N \
         /  |   \
        x   x   x
        |   |   |
      [-N][+N][-N]
```
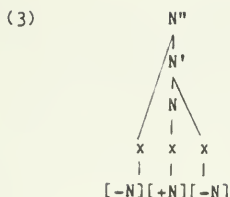
Universal grammar specifies the position of the syllable head, N. The nucleus N node percolates itself up to N", which is the highest constituent for a syllable. Thus, N" cannot exist without the syllable head, N. The stray x slots are incorporated into the syllable constituent node to build a syllable.

    (4) Syllable Building Rules
        a. N" Branching
            Attach to the left of N" the x' immediately preceding x (x' refers to the unsyllabified x),
        b. N' Branching
            Attach to the right of N' the x' immediately following x.

    The application of the rules (4a) and (4b) are shown as (5a) and (5b) respectively.

(5) a.
```
                              N"
                             /|
                            /N'
                           / |
            N             /  N
            |            /   |
          x' x   ---->  x    x
            |           |    |
          [+N]        [-N] [+N]
```

     b.
```
                            N"
                            |
                            N'
                            /\
            N              N \
            |              |  \
          x  x'   ---->   x    x
          |               |    |
         [+N]           [+N] [-N]
```
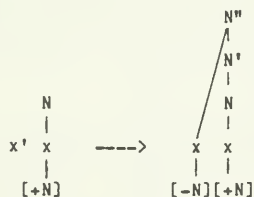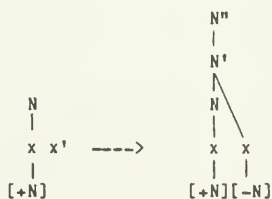
Rules (4a) and (4b) apply in that order. Core syllabification of Korean represented by rule (4) allows at most binary branching for N, N', and N" nodes.

2.2. Underspecification

    It is assumed in this paper that the syllable structure and vowel melody planes involve underspecification in their underlying representation

(Archangeli 1984). Universal grammar specifies nothing but the nucleus
position. Other parts of the syllable structure are built by either
language particular or universal parameters. Thus, the three kinds of
nuclei in Korean, short vowel, long vowel and diphthong are represented
with the following underlying structure:

(6) a.   N   b.   N   c.   N
           | /\   /\
           x   x   x   x   x
           | \/ | |
          [ ]   [ ]   [ ][ ]
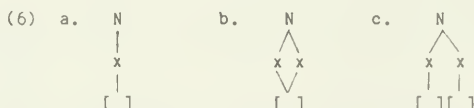
(6a) represents a nucleus N occupying a single slot i.e. a short vowel. In
(6b), a single feature matrix occupies two skeletal slots under N, and
represents a long vowel. In (6c), however, two slots under a branching N
are linked to different features i.e. a diphthong. The contrast between
(6b) and (6c) illustrates how a long vowel is differentiated underlyingly
from the diphthong. Syllable Building rules (4) and the underlyingly
specified nucleus structures in (6) predict that a syllable in Korean
occupies at most four x slots.

The assumption of the underspecification of the vowel melody plane is
crucial to the simplification of the grammar. The fact that *w$\overset{\cdot}{+}$ and *y$\overset{\cdot}{+}$
are not possible diphthongs and that the featureless nucleus surfaces as a
high back unround vowel [$\overset{\cdot}{+}$] suggests that the vowel [$\overset{\cdot}{+}$] is least marked in
Korean. If we follow Archangeli (1984) in assuming that the redundancy
rules which fill in the feature matrices interact with other phonological
rules, these two observations are accounted for in a much simpler way, as
briefly mentioned below.

The absence of diphthongs including $\overset{\cdot}{+}$ as a half of their structure is
simply stated as deleting the x slot which has no feature matrix, as will
be shown with respect to $\emptyset$-Deletion (25). If the vowel matrix is fully
specified in the underlying representation, the gaps in diphthongs can be
accounted for only by stipulation. We return to this in the discussion of
the p-irregular verbs in 4.3. Considering the interaction of the vowel $\overset{\cdot}{+}$
represented as an empty nucleus x slot with other vowels, underspecifying
the features and later filling in the unspecified features by redundancy
rule is less costly than specifying the inserted x slot with concrete
features [+high, +back, -round] from the underlying entry. We return to
this in the discussion of the vowel-final regular verbs in 3.4. Though a
full-fledged account of the underspecification of Korean vowels is not
relevant to this paper, it is necessary to see where the features for the
vowel $\overset{\cdot}{+}$ are assigned. As Baker (1982) argues, the feature [-back] is
underlyingly specified in Korean. A redundancy rule fills in the default
value [+back] to the unspecified slot after certain phonological rules.
Finally, default values [+high] and [-round] are inserted by Complement
Rules (Archangeli 1984), spelling it out as [$\overset{\cdot}{+}$]. The underspecification of
the syllable structure and of the feature matrix for a vowel simplifies the
grammar and provides an explanatory account of the phonological
alternations. This is illustrated with respect to vowel deletion,
monophthongization, and glide formation rules in lexical phonology.

As already mentioned, the account of consonant alternations in this

paper makes crucial use of the lexical stratum of verbal morphology. We now turn to an outline of the lexical model of Korean phonology.

2.3. Lexical Phonology

Korean has a rich morphology of verbal suffixes. The verbal form adds its suffixes from the verbal stem to the right in an endocentric fashion. Illustrative among the verbal suffixes are morphemes of honorifics, formality, and aspectuals. For example, the verbal form konpuha-si-pni-ta expands as in (7), where C_n stands for "cycle n".

(7) [[[[verbal stem]$_{C1}$ honorific]$_{C2}$ formal]$_{C3}$ indicative ending]$_{C4}$
    [[[[konpuha] si] pni] ta]

Lexical phonology allows the application of phonological rules to follow each morphological operation. That is, each addition of morphological structure is followed by application of phonological rules. Thus, the morphology and phonology processes are interwoven.

In order to properly account for the alternation of the final consonant of the irregular verbal stem, it is necessary to look into the morphological stratum in addition to the cyclic expansion shown in (7). Following the model of lexical phonology (Mohanan 1981), I assume the lexicon of Korean verbal morphology consists of ordered lexical strata, as shown in (8). The cycles C_2 and C_3 in (7) belong to a single stratum, and the aspectuals constitute a separate stratum.

(8)   Stratum I: Nominalizer m
                  Effective marker ni
                  Honorific marker si
                  Propositive marker psi
                  Formal marker spni
       Stratum II: Indicative ta
                   Connective ko
                   Stative a

There is no loop between stratum I and stratum II in Korean. That is, the stratum II morpheme cannot feed back the stratum I morpheme.

The expansion of each cycle to add a morpheme is followed by the application of the phonological rules available in the corresponding stratum. The lexical rules that apply in the domain of a stratum meet the Strict Cycle Condition (Mascaro 1976) because they should be prevented from applying in a non-derived environment. The lexical rules apply across brackets or if the environment is created by application of a phonological rule. Contrary to the lexical rules which are sensitive to word internal morphological information, postlexical rules do not refer to the internal constituent structure since all brackets are erased at the end of each stratum, although not at the end of each cycle (Mohanan 1981).

The model of lexical phonology, along with underspecification, contributes to simplifying rule formulation. If the redundancy rule which assigns a feature matrix for the least marked vowel ÷ in Korean is delayed as a postlexical rule, both lexical and postlexical rules which are

sensitive to the vowel ɨ turn out to refer to the skeletal tier, regardless
of the features that are linked to the x slot. The ɨ-deletion rule, for
instance, can be simply formulated to delete a featureless x slot.

With the theoretical assumptions and the lexical model of Korean
verbal morphology sketched so far, we now turn to the analysis of the
verbs. Before discussing the irregular verbs, I provide an overview of the
regular verbs in Korean in the following section.

In the analysis of the verbs, morphemes are assumed to have the
following underlying representations. The x slot with a vertical line
above it refers to a nucleus specified in the underlying representation,
whereas the simple x slot a consonantal position.

```
(9)  a. Nom.     b. Effect.   c. Honor.    d. Propos.   e. Formal.
        |           |  |          |  |          |   |         |     |
        x x         x x x        x x x        x x x x       x x x x x
        |           |  |          |  |          |  |  |      |   |  | |
        m           n i          s i          p s i        s   p n i

     e. Ind.    f. Conn.   g. Stat.
        |           |         |
        x x         x x       x
        |  |        |  |       |
        t a         k o       a
```

The underlying representations above account for the alternation between
the presence and absence of the vowel ɨ which is represented by the
unspecified nucleus x slot. We will return to this in 3.4.

3. Regular Verbs in Korean

Study of the regular verbs reveals how regular the behavior of the
irregular verbs are. In what follows we look into regular verbs which are
relevant to the discussion of the irregular verbs. Among the verbs with a
consonant-final stem, /s/-, /t/-, and /p/-regular verbs are of particular
interest since they contrast with their irregular counterparts. Verbs with
vowel-final stems are also interesting due to their interaction with the
following suffix initial vowel.

3.1. /s/-Regular Verb

/s/-regular verbs refer to a class of verbs whose stem ends with the
consonant s.

```
(10) Nom.       Effect.     Honor.      Propos.      Formal
  a. pəs-ɨm     pəs-ɨni     pəs-ɨsi     pəs-ɨpsi     pət-s'ɨpni
  b. s'is-ɨm    s'is-ɨni    s'is-ɨsi    s'is-ɨpsi    s'it-s'ɨpni
  c. us-ɨm      us-ɨni      us-ɨsi      us-ɨpsi      u:t-s'ɨpni

     Ind.       Conn.       Stat.       Gloss
  a. pət-t'a    pək-k'o     pəs-a       `to wear off'
  b. s'it-t'a   s'ik-k'o    s'is-a      `to wash'
  c. u:t-t'a    u:k-k'o     us-a        `to smile'
```

In the verbal paradigms in which the suffix begins with the nucleus x slot i.e. with vowel, the stem-final consonant s does not show any alternation. In the formal, indicative, and connective forms, however, the stem-final consonant s alternates with either t or k. In the former case where the stem-final s does not show any alternation, all that is left for phonology to do is to fill in the feature matrix for the unspecified nucleus x slot in the suffix. Thus, the honorific form pəs-ɨsi is derived by inserting the vowel [ɨ].

(11)
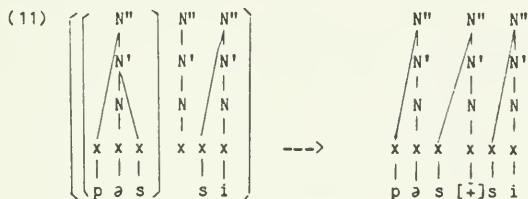
The feature matrix of an empty x slot is determined by the redundancy rule if the x slot is directly dominated by N node in the syllable structure. Since the empty x slot in (11) is the nucleus of the syllable, it is underlyingly specified with the categorial feature [+N]. Once the x slot is specified with respect to the categorial feature [+N], it is subject to the redundancy rule for a [+N] segment. Redundancy rules fill in the feature matrix for the unspecified nucleus x slot.

(12) [+N] Redundancy Rules
  a. [ ] --> [+high]
  b. [ ] --> [+back]
  c. [ ] --> [-round]
  d. [ ] --> [-low]

[+N] Redundancy Rules in (12) spell out the empty nucleus x slot with the least marked vowel [ɨ], thus deriving pəs-ɨsi in (11).

In the latter case where the stem-final s alternates with either t or k, the phenomena involved in the alternations are accounted for by such phonological rules as Tensing, Neutralization, and Assimilation.

Tensing of the suffix-initial obstruent is explained by a very general rule in Korean.

(13) Tensing
      x   ---> [+tense] /   x ___
      | |
    [-son]   [-son]
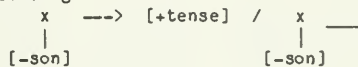
The second obstruent in obstruent clusters is always tensed by the preceding obstruent. For example, /kakca/ `individual' is realized as kakc'a, and /cəptæ/ `entertainment' as cəpt'æ. Since Tensing (13) applies in a nonderived as well as derived environment it is a postlexical rule. The alternation of the suffix initial consonants s, t, k with s', t', k' in

formal, indicative, and connective forms respectively in (10) do not form a peculiar part of the Korean phonology.

Neutralization is another postlexical rule by which the obstruent in the coda position is neutralized into the homorganic stop.

(14) Neutralization[3]

$$
\begin{bmatrix} -son \\ +cont \end{bmatrix} \ ----> \ \begin{bmatrix} -son \\ -cont \end{bmatrix} \ / \begin{array}{c} N' \\ | \\ x \\ \underline{} \end{array}
$$
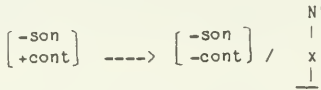
The formal form pət-s'ɨpni is derived as follows:

(15)
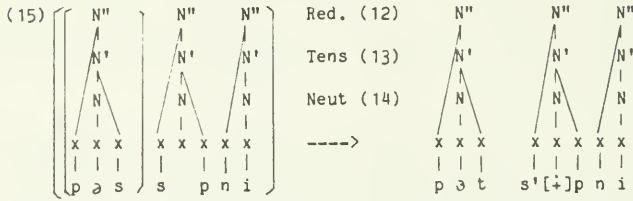
The connective form pək-k'o involves an assimilation of place of articulation.

(16) Assimilation
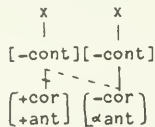
The assimilation of the alveolar obstruents into labial or velar is another common postlexical rule since it applies in nonderived environments as well. For example, /sətpulli/ `hastily' is realized as sapp'uli, and /cətkarak/ `chopsticks' as cakk'arak.

The derivation of pək-k'o is as follows:

(17)
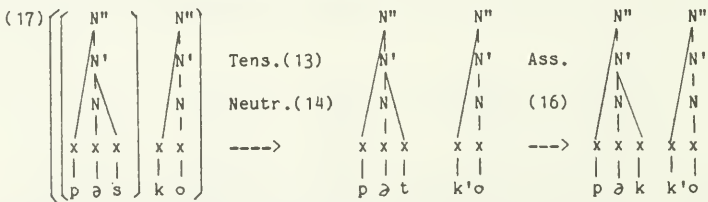
The derivation of the verbal forms of the /s/-irregular verb involves [+N] Redundancy Rules (12), Tensing (13), Neutralization (14), and

Assimilation (16), all of which apply in the postlexical cycle. One
alternation left unaccounted for is that of stem vowel length in (10c). It
is discussed in 3.3.

    The reason the verbs in (10) are regarded as regular in spite of the
alternations in the formal, indicative, and connective forms is that the
alternations are general phenomena with respect to the whole phonology of
Korean. That is, the four rules needed to account for the verbal
alternations are not peculiar only to the verbal forms.

3.2. /t/-Regular Verbs

    The verbs in (18) show some of /t/-regular verbs.

    (18)   Nom.   Effect.   Honor.   Propos.   Formal.
        a. kət-ɨm   kət-ɨni   kət-ɨsi   kət-ɨpsi   kət-s'ɨpni
        b. mut-ɨm   mut-ɨni   mut-ɨsi   mut-ɨpsi   mut-s'ɨpni
        c. tit-ɨm   tit-ɨni   tit-ɨsi   tit-ɨpsi   tit-s'ɨpni

           Ind.   Conn.   Stat.   Gloss
        a. kət-t'a   kək-k'o   kət-a   `to pull up'
        b. mut-t'a   muk-k'o   mut-a   `to bury'
        c. tit-t'a   tik-k'o   tit-a   `to tread'

The alternation of the stem final t with k before the connective suffix ko
is accounted for by Assimilation (16). The connective form kək-k'o is
derived as follows:

(19)
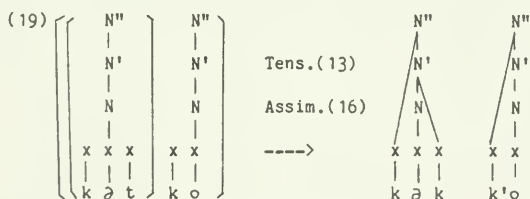
The alternations involved in /t/-irregular verbs are accounted for without
adding any more rules to the phonological component.

3.3. /p/-Regular Verbs

    /p/-regular verbs refer to the verbs whose stem-final consonant ends
with p.

    (20) Nom.   Effect.   Honor.   Propos.   Formal.
        a. kop-ɨm   kop-ɨni   kop-ɨsi   kop-ɨpsi   kop-s'ɨpni
        b. kup-ɨm   kup-ɨni   kup-ɨsi   kup-ɨpsi   kup-s'ɨpni
        c. s'ip-ɨm   s'ip-ɨni   s'ip-ɨsi   s'ip-ɨpsi s'i:p-s'ɨpni

           Ind.   Conn.   Stat.   Gloss.
        a. kop-t'a   kop-k'o   kop-a   `to be numb'
        b. kup-t'a   kup-k'o   kup-a   `to bend'

c. s'i:p-t'a   s'i:p-k'o   s'ip-a   `to chew'

Tensing of the suffix-initial obstruent is, as already pointed out, a common phenomenon. However, the alternation of the stem vowel length in (20c), along with the one in (10c), remains to be explained. A closer look at the verbal forms in (20c) reveals that the length of the stem vowel is dependent upon whether the following suffix begins with vowel or consonant. That is, the underlying long vowel in the stem becomes short when the following suffix begins with vowel.

(21) Vowel Shortening
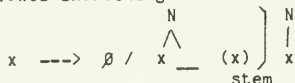
Vowel Shortening (21) is a lexical rule since it refers to the morpheme boundary.

The derivations of s'ip-+ni and s'i:p-s'+pni are as follows:

(22)
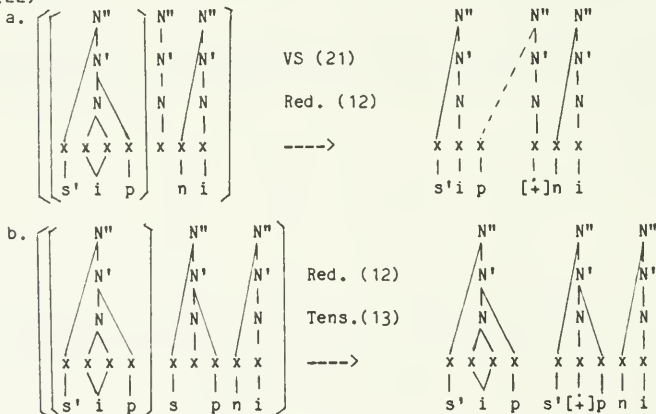
In (22b), Vowel Shortening does not apply because the suffix does not begin with syllable nucleus.

Shortening the stem vowel is a general process in verbal phonology, conditioned by the suffix initial vowel. As we will see below, it applies regardless of whether the verb is regular or irregular, and regardless of whether the stem is consonant- or vowel-final.

3.4. Verbs of Vowel-Final Stem

Verbs whose stem ends with vowel show interesting phenomena with respect to underspecification.

(23) Nom.   Effect.   Honor.   Propos.   Formal.
  a. ci-m   ci-ni   ci-si   ci-psi   ci-pni
  b. i-m   i-ni   i-si   i-psi   i-pni
  c. ka-m   ka-ni   ka-si   ka-psi   ka-pni
  d. sə-m   sə-ni   sə-si   sə-psi   sə-pni
  e. pe-m   pe-ni   pe-si   pe-psi   pe-pni

     Ind.   Conn.   Stat.   Gloss
  a. ci-ta   ci-ko   ci-a   `to lose'
  b. i-ta   i-ko   i-a   `to put on the head'
  c. ka-ko   ka-ta   ka   `to go'
  d. sə-ko   sə-ta   sə   `to stand'
  e. pe-ko   pe-ta   pe-a   `to cut'

The verbs in (23) are regular in the sense that the verbal stem does not
alternate through the verbal paradigms. However, the suffix-initial
nucleus is systematically deleted when the suffix begins with a syllable
nucleus. The other alternations to be accounted for are deletion of the
initial consonant s in the formal suffix, and the absence of the stative
suffix in (23c,d).

     In case of the vowel-final verbal stem, suffixation results in a
sequence of syllable nuclei when the suffixal morpheme begins with a
syllable nucleus. One of the abutting vowels in such a sequence is always
deleted in stratum I. Let's take, for example, the effective form ci-ni in
(23a). The morphological derivation in stratum I gives the following
detailed representation. Universal Association Convention associates the
feature matrices with x slots in the skeletal tier one to one from left to
right.

(24)
$$\left[\left[\begin{array}{cc} & N \\ & | \\ x & x \\ | & | \\ c & [-back] \end{array}\right]_{+N} \quad \begin{array}{ccc} N & & N \\ | & & | \\ x & x & x \\ & | & | \\ & n & [-back] \end{array}_{+N}\right]$$
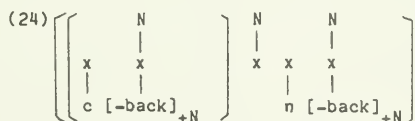
In (24), one of the two adjacent vowels is specified with the feature
[back], while the other is totally unspecified. In a sequence of two
syllable nuclei, the unspecified syllable nucleus is deleted.

(25) ⊗̇-Deletion

$$\overset{|}{\textcircled{x}} \;\; \longrightarrow \;\; \emptyset \; / \; \left.\begin{array}{c} N \\ | \\ x \end{array}\right]\underline{\quad}$$
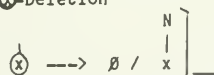
Circled x slot with a vertical line refers to a nucleus vowel whose
'feature matrix is empty. Empty Nucleus Slot Deletion (25) is a lexical
rule since it refers to a bracket. Thus, the unspecified nucleus x slot in
(24) is deleted by ⊗-Deletion (25), and the correct form ci-ni is derived.

   In the stative forms in (23) where the two vowels surface, however,
neither the stem-final vowel nor the stative suffix a is unspecified.
Thus, the structural description of ⊗-Deletion (25) is not met, and both of

the two adjacent vowels surface, as in ci-a, i-a, and pe-a.

The appearance of vowel sequences in the stative forms in (23) provides evidence for underspecification. It shows what counts in deletion of a vowel in the vowel sequence is not linear order but the presence or absence of specified features. If all the distinctive features are underlyingly specified for all the vowels as SPE theory (Chomsky and Halle 1968) does, then the vowel $\dot{+}$ is no different from the rest of the vowels in Korean. As a consequence, deletion of the vowel $\dot{+}$, but not of any other vowel, in a vowel sequence is accounted for by an ad hoc stipulation to that effect. Following underspecification, however, a vowel sequence with the vowel $\dot{+}$ is not comparable to a sequence without $\dot{+}$.[4] The former has an empty x slot, while the latter has no empty x slots. Since the two types of nucleus sequences are different in their featural representations, it does not take an ad hoc stipulation for the unspecified nucleus x slot to be deleted. Rather, it naturally follows from the theory of underspecification, according to which $\dot{+}$ is asymmetrical to the rest of the vowels in Korean.

Turning to the formal form ci-pni in (23a), we need a rule to delete suffix-initial s after a stem-final vowel.

(26) s-Deletion
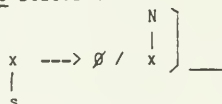
```
              N ⎤
              |  ⎬
  x  ---> ∅ / x ⎦ ___
  |
  s                        (Domain: Stratum I)
```

The formal form ci-pni in (23a) is derived as follows:

(27)
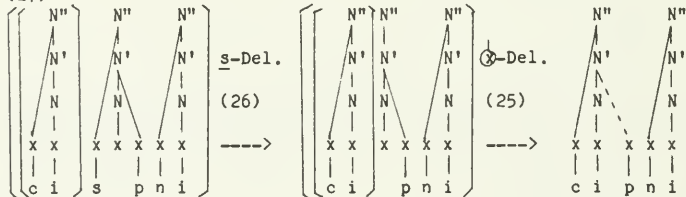
In the derivation in (27), application of s-Deletion (26) feeds ⊗-Deletion (25). This is why the formal suffix loses its empty nucleus slot although it does not begin with empty nucleus x slot as other suffixes in stratum I do.

One more point to be made about the verbal forms in (23) is the vowel deletion in the stative forms of (23c,d). Since the stative suffix is a, ⊗-Deletion (25) is not applicable. Deletion of the stative vowel is simply a contraction which applies when the two adjacent vowels are of the same feature.[5]

(28) Contraction[6]

$$
\left.
\begin{array}{cc}
N & N \\
| & | \\
x \ \dashrightarrow \ \emptyset \ / \ x \\
| & | \\
[\alpha\,F] & [\alpha\,F]
\end{array}
\right\} \ \underline{\quad}
$$
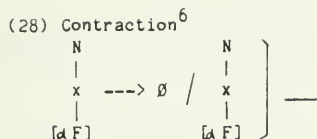
To illustrate, <u>ka</u> as stative form in (23c) is derived as follows:

(29)
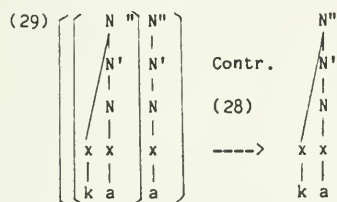
Although paradigms of only five vowel-final verbs are illustrated in (23), the vowel-final verb behaves regularly whatever vowel the stem ends with, except <u>i</u>. Discussion of the <u>i</u>-final stem is given in 4.5.

3.5. Summary

The regular verbs in Korean need phonological rules to account for the interaction between the verbal stem and the suffix. Among the postlexical rules are [+N] Redundancy rules (12), Tensing (13), Neutralization (14), and Assimilation (16). Among the lexical rules are Vowel Shortening (21), ⊗-Deletion (25), s-Deletion (26), and Contraction (28). These lexical rules, except s-Deletion (26), do not need a lexical domain specified as a part of their rule description. All the postlexical rules listed above are general rules in the sense that they are required to account for general Korean phonological processes. The lexical rule ⊗-Deletion (25) is also a general rule since it applies to nouns when they are followed by affixes which begin with a featureless nucleus. On the other hand, the rest of the lexical rules apply only to the verbs.

With the rules necessary to account for the regular verbs, we now turn to discussion of the irregular verbs to show that they are no less regular than their regular verbs.

4. The Irregular Verbs
4.1. /s/-Irregular Verb

In figure (30) we see some verbs traditionally called /s/- irregular verbs.[7] This class of irregular verbs contrasts with the regular counterpart in (10).

(30) Nom.	Effect.	Honor.	Propos.	Formal
a. ci-ɨm	ci-ɨni	ci-ɨsi	ci-ɨpsi	ci:t-s'ɨpni
b. i-ɨm	i-ɨni	i-ɨsi	i-ɨpsi	i:t-s'ɨpni
c. kɨ-ɨm	kɨ-ɨni	kɨ-ɨsi	kɨ-ɨpsi	kɨt-s'ɨpni

	Ind.	Conn.	Stat.	Gloss
a.	ci:t-t'a	ci:k-k'o	ci-a	`to make'
b.	i:t-t'a	i:k-k'o	i-a	`to connect'
c.	kɨt-t'a	kɨk-k'o	kɨ-a	`to draw'

Of interest first is the vowel-final to consonant-final alternation.
Another strange alternation to be accounted for in the irregular verbal
forms in (30) is the appearance of a sequence of vowels across the morpheme
boundary. In discussion of regular vowel-final verbs, it has been noted
that the verbal forms in Korean do not tolerate vowel sequence in derived
environments if one of the vowels is /ɨ/. Recall Ⓧ-Deletion (25) here.
None of the regular vowel-final verbs in (23) allows two adjacent vowels,
while the /s/-irregular verbs in (30) do.

The non-application of Ⓧ-Deletion (25) to the so-called /s/- irregular
verbs in (30) is reduced to two possible reasons: one is that the stem of
this class of verb is not vowel-final, and the other is that it is
vowel-final but this class of verbs are diacritically marked so that
Ⓧ-Deletion (25) cannot apply. In accounting for the appearance of vowel
sequences in (30), we prefer the former to the latter because a diacritic
use of a phonological rule does not provide any explanatory adequacy.

Now, if the appearance of vowel sequences in (30) is due to the fact
that the stem does not end with vowel, then it must be the case that either
the stem is consonant-final or it has some featureless consonant slot in
the stem-final position. In case the stem is consonant-final, we can
derive the correct form, for example, ci-ɨni in (30a), by deleting the
postulated stem-final consonant and ordering Ⓧ-Deletion (25) prior to the
stem-final consonant deletion. Since the two processes are extrinsically
ordered in a bleeding relation, we derive the correct form with a vowel
sequence. However, this analysis is not plausible because the features of
the postulated stem-final consonant are totally arbitrary. At best,
deletion of the stem-final consonant is diacritically marked since there
are regular verbal counterparts whose stem-final consonants are not
deleted.

Adopting the alternative possibility, if the stem of the so-called
/s/-irregular verb ends with a featureless x slot which is redundant with
respect to the feature matrices in the segmental plane, then
non-application of Ⓧ-Deletion (25) is exactly what is expected since the
suffix-initial nucleus is not abutting the nucleus in the stem due to the
intervening stem-final featureless x slot.

Comparing the /s/-irregular verbal forms in (30) with the /s/-regular
verbs in (10) and vowel-final regular verbs in (23), I suggest different
underlying representations.

```
(31)  a.   N     (30)  b.  N    (10)  c.  N    (23)
          /\              |              |
        x x x x         x x x          x x
        | \/            | | |          | |
        c i             p ə s          c i
```

(31a), (31b), and (31c) are the underlying representations of the verbal

stems in (30a), (10a), and (23a) respectively. What is noticeable is that the so-called /s/-irregular verbs have an empty x slot in the skeletal tier in the underlying representation. Core syllabification attaches it to the N' node.

(32)

```
        N"
       /N'.
     / N
     / /\
    x x x x
    |  \/
    c   i
```
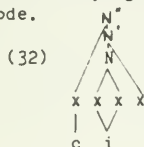
Thus, (31a) is differentiated from (31b) with respect to whether the final slot under N' is segmentally empty or not (interested readers are referred to the Turkish data in Clements and Keyser (1983) for a similar case), and it is differentiated from (31c) with respect to whether the N' node is branching or not. It has already been explained in 3.4 that a vowel is deleted when abutting another vowel, and that the precise determination of the vowel to be deleted is predictable on the ground of underspecification. These facts are captured in $\otimes$-Deletion (25), which is repeated below for convenience.

(25) $\otimes$-Deletion

$$x ---> \emptyset \quad / \quad \left. \begin{matrix} N \\ | \\ x \end{matrix} \right\} \underline{\qquad}$$
$$\text{stem}$$

At first glance, the stratum I verbal forms in (30) (except for the formal forms) look like counterexamples to $\otimes$ -Deletion (25), thus turning out to be diacritically marked as exceptions to the rule. However, it is argued that the structural description of $\otimes$-Deletion (25) is not met in those forms if we assume the nonlinear underlying representation like (31a).

The effective forms <u>ci-⁺ni</u> and <u>ci-ni</u> respectively in (30a) and (10a) are differentiated with respect to the applicability of $\otimes$-Deletion (25). The derivations of <u>ci-⁺ni</u> and <u>ci-ni</u> are shown in (33a) and (33b) respectively.

(33) a.

```
  (( N"    ) N"  N" )   VS(21)
  |  |      /|  /|
  | /N'    / N' /N'    Red(12)
  | |\    / | | |
  | N \  / N  N
  | |\ \/  |  |
  | x x x x  x x x
  | | \/     | | |
  (( c  i   ) [⁺]n i )
```

b.

```
  (( N"  ) N"  N" )   $\otimes$-Del(25)
  |  /|   |  /|
  | /N'   N' /N'
  | | |   | | |
  | N |   N  N
  | | |   | | |
  | x x   x x x
  | | |   | | |
  (( c i  ) n i )
```
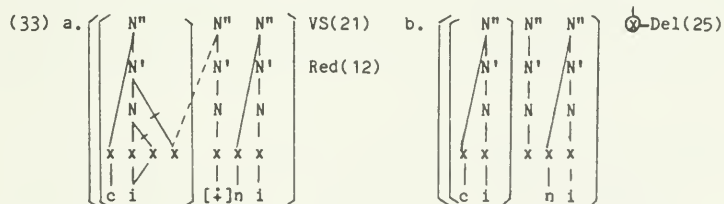
In (33a) the empty x slot which makes the N' node branching blocks the application of the $\otimes$-Deletion (25). That is, the empty x slot intervenes between the two otherwise adjacent nuclei. Unless the skeletal tier is separately represented from the feature matrix, the empty x slot is invisible because it has no feature. As a result, the $\otimes$-Deletion (25) would apply in (33a) as it does in (33b), deriving an incorrect form for

(33a). Within the framework of nonlinear representation, however, the
structural description of Ⓧ-Deletion (25) is simply not met in (33a) since
the rule deletes an unspecified nucleus x slot immediately after another
syllable nucleus.

The empty x slot is resyllabified as the onset of the following
syllable at the end of the lexical cycle. The x slot which is assigned no
feature is not realized phonetically. It is shown shortly that the empty x
slot in the coda position is specified with features by rule. [+N]
Redundancy rule (12) derives ci-ɨni in (33a). In (33b), Ⓧ-Deletion (25)
derives ci-ni.

It is only by way of incorporating the skeletal tier in the underlying
representation that the two forms in (33) are distinguished. The
appearance of a sequence of vowels, though one of the vowels is the
underlyingly unspecified vowel ɨ, is not an exception to the application of
Ⓧ-Deletion (25). Since the inapplicability of Ⓧ-Deletion (25) in the
/s/-irregular verb naturally follows from the underlying representation
like (31a), it is incorrect to regard this class of verb as irregular. The
least marked vowel ɨ appears though preceded by another vowel, because it
is not abutting the preceding vowel in the skeletal tier.

Let's look at the formal, indicative, and connective forms in (30).
We find that the empty skeletal slot in the underlying representation is
filled only when a consonant-initial suffix follows. The empty slot in the
stem is filled by a redundancy rule for [-N] segments.

(34) [-N] Redundancy Rule

$$
\begin{array}{ccc}
N' & & N' \\
| & & | \\
Ⓧ & \longrightarrow & x \\
& & | \\
& & [t]
\end{array}
$$
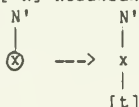
"N'" in the formulation of rule (34) refers to a consonantal position in
rime i.e. a coda. If [-N] Redundancy Rule (34) applies on any cycle, it
fills in the empty x slot in every verbal form of the /s/-irregular verb,
which is not correct. In order to derive the correct form, we follow
Archangeli (1984) in assuming that the redundancy rule applies as late in
the postlexical cycle as possible, as the [+N] Redundancy Rules (12) do.

The connective form in (30a) is derived as follows:

(35)

$$
\left[
\begin{array}{c}
N'' \\
N' \\
N \\
x\;x\;x\;x \\
c\quad i
\end{array}
\right]
\quad
\begin{array}{c}
N' \\
N' \\
N \\
x\;x \\
k\quad o
\end{array}
\qquad
\begin{array}{l}
\text{[-N]Red. (34)} \\
\text{Tens. (13)} \\
\text{Assim.(16)} \\
\longrightarrow
\end{array}
\qquad
\begin{array}{c}
N'' \\
N' \\
N \\
x\;x\;x\;x \\
c\quad i\quad k
\end{array}
\quad
\begin{array}{c}
N'' \\
N' \\
N \\
x\;x \\
k'o
\end{array}
$$
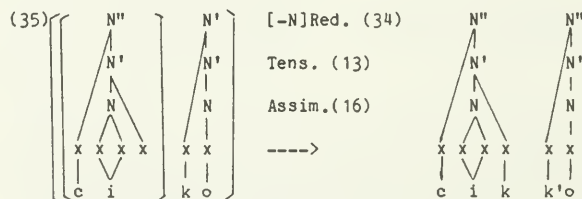
In the derivation of the verbal forms, resyllabification is assumed to

apply at the end of every cycle. In the lexical cycles, no rule is applicable. In the postlexical cycle, the empty x slot is attached to the N' node as coda of a syllable. Thus, [-N] Redundancy Rule (34) applies, filling in the empty x slot with [t]. The correct connective form c̲i̲:̲k̲-̲k̲'̲o̲ is derived by Tensing (13) and Assimilation of place of articulation (16).

The derivation of the formal form c̲i̲:̲t̲-̲s̲'̲ɨ̲p̲n̲i̲ in (30a) is shown in (36). The lexical entry at stratum I is (36a).

(36) a.

```
 ⎡⎧  N'''  ⎫   N'''    N''' ⎤   [+N]Red(12)        N'''     N'''     N'''
 ⎢⎪   |   ⎪    |       |    ⎥                       |        |        |
 ⎢⎪  /N'  ⎪   /N'     /N'   ⎥   [-N] Red(34)       /N'      /N'      /N'
 ⎢⎪  |    ⎪   |       |     ⎥                      |        |        |
 ⎢⎪  N\   ⎪   N\      N     ⎥   Tens(13)           N        N        N
 ⎢⎪ / \   ⎪   | \     | \   ⎥                     / \       |        |
 ⎢⎪x x x x⎪  x x x x x      ⎥   ---->         x x x x   x x x x x
 ⎢⎪| \/   ⎪  | | | |        ⎥                 | \/ |    | | | | |
 ⎣⎩c  i   ⎭  s  p n i       ⎦                 c  i [t]  s'[ɨ]p n i
                                                                  b.
```
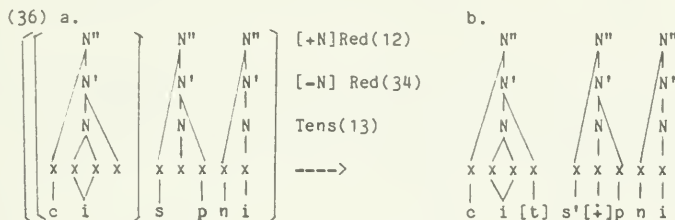
The empty x slot which makes the N' node branching blocks the application of s̲-Deletion (26). As a consequence, the verbal stem is not directly followed by a vowel, and hence Vowel Shortening (21) does not apply. The empty x slot is not resyllabified as onset of the following syllable, allowing [-N] Redundancy Rule (34) to apply (compare with the derivation of vowel final verbs in (27) where there is no empty x slot).

The derivations in (35) and (36) are no less regular than regular verbs, since their underlying representations are different from those of the regular verbs. [-N] Redundancy Rule (34) is the only one that is additionally motivated to account for the irregular verbs. But this may be independently motivated as a more general rule in Korean[9].

The traditional analysis, in which s̲ appears underlyingly as a stem-final consonant, still needs Neutralization (14) to derive t̲ in formal or indicative forms. Therefore, adding one more rule in the present analysis does not simply make the grammar more complex. Rather, the present analysis shows that the /s/-irregular verbs behave differently from the /s/-regular verbs because the underlying representations of these two classes of verbs are different. As a result, the alternations in /s/-irregular verbs are not unpredictable or idiosyncratic, but entirely rule-governed and regular.

To recapitulate, the vowel- to consonant-final alternation on the one hand, and the systematic appearance of a vowel sequence with the vowel ɨ preceded by stem-final vowel on the other, are best treated by assuming an underlying representation like (31a), namely, where the stem looks vowel-final in the segmental plane but actually is not vowel-final in the core skeleton.

So far, assuming an empty x slot in the underlying representation of the /s/-irregular verb has been motivated with respect to ⊗-Deletion (25) and s̲-Deletion (26). Another piece of evidence that the stems of the /s/-irregular verbs have an empty x slot in the skeletal tier is provided

with respect to the glide formation rule which applies in the postlexical cycle.

(37) Glide Formation[10]

```
      N       N
      ╵  . - ╴ ╷
      x       x
      |
    ⎡ +hi ⎤
    ⎣ +son ⎦
```
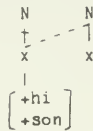
In a sequence of two vowels where the first vowel is <u>i</u> or <u>u</u> and the second one is not <u>ɨ</u>, the high vowel becomes a glide before another vowel. The application of Glide Formation (37) is optional. Thus, the stative forms in (23) show the applicability of Glide Formation (37). But rule (37) cannot apply to the stative forms of the /s/-irregular verb in (30). To show the contrast:

(38) a. ci-ə/ cya `to lose'    i-ə/ ya `to carry on the head' (23)
     b. ci-ə/ *cya `to make'   i-ə/ *ya `to connect'   (30)

The two forms in (38a) are the stative forms of the regular verbs in (23), while those in (38b) are the stative forms of the irregular verbs in (30). Since the stative forms in (38b) have an empty x slot intervening between the syllable head of the stem and that of the stative morpheme, it does not meet the structural description of Glide Formation (37). Unless we refer to the skeletal tier, this distinction cannot be made since the empty x slot is not defined by featural representation.

The way in which the verbal forms in (30) interact with ∅-Deletion (25), <u>s</u>-Deletion (26), and Glide Formation (37) provides substantial evidence for postulating structures like (31a) as the underlying representation of the /s/-irregular verb. Thus, the presence or absence of a consonant in the stem-final position, and the presence of the two vowels in a row in the /s/-irregular verb are accounted for by making crucial reference to the skeletal tier and the underspecified features. With respect to the account provided in the present analysis the so-called /s/-irregular verbs are neither irregular, nor do they end with <u>s</u> in their stem.[11]

4.2. /t/-Irregular Verb

This class of verbs is called /t/-irregular because the stem-final consonant alternates between <u>t</u> and <u>r</u>.

(39) | Nom. | Effect. | Honor. | Propos. | Formal. |
|---|---|---|---|---|
| a. kər-ɨm | kər-ɨni | kər-ɨsi | kər-ɨpsi | kə:t-s'ɨpni |
| b. mur-ɨm | mur-ɨni | mur-ɨsi | mur-ɨpsi | mu:t-s'ɨpni |
| c. tɨr-ɨm | tɨr-ɨni | tɨr-ɨsi | tɨr-ɨpsi | tɨt-s'ɨpni |

Ind.	Conn.	Stat.	Gloss
a. kə:t-t'a	kə:k-k'o	kər-a	`to walk'
b. mu:t-t'a	mu:k-k'o	mur-a	`to ask'
c. tɨt-t'a	tɨk-k'o	tɨr-a	`to hear'

Except for the connective, the alternation in (39) is reduced to that between t and r. If we take the underlying phoneme of the alternating segment as /r/$^{+2}$, the words in (39) are derived rather straightforwardly. The underlying phoneme of the stem-final consonant in the regular verb in (18) is /t/.

(40) Underlying Representation
    a. /t/-regular   b. /t/-irregular

```
        N                        N
        |                        /\
    x   x   x                x   x   x   x
    k   ə   t                k   ə       r
   `to pull up'                `to walk'
```
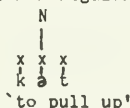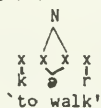
Assuming the underlying representations like (40b), the derivation of the verbal forms in (39) whose suffix begins with a vowel is simply without any alternation. The derivation of the propositive form kər-ɨpsi is as follows:

(41)

```
  ⎡⎛   N"  ⎞   N"      N"  ⎞       VS (21)
  ⎢⎜   /\  ⎟   /|      /\  ⎟
  ⎢⎜  /N'  ⎟  / N'    /N' ⎟       [+N] Red.(12)
  ⎢⎜  /\   ⎟ /  |    /  |  ⎟
  ⎢⎜  N    ⎟/   N    /   N  ⎟
  ⎢⎜  /\   /    |   /    |  ⎟
  ⎢⎜ x x x x   x x x x   ⎟
  ⎢⎜ | V | |   | | | |   ⎟
  ⎣⎝ k ə  r ⎦[ɨ]p s i    ⎠
```
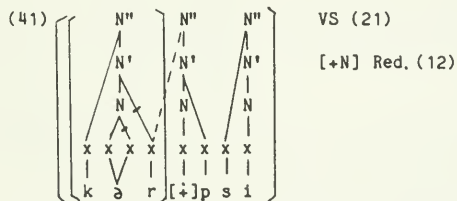
The stem-final consonant r alternates with t in formal, indicative, and connective forms in (39). The position of r in the syllable in these forms is different from that of the non-alternating r. In the former case, r remains in the coda position, while in the latter case, it is resyllabified as the onset of the following syllable since the suffixes begin with vowels.

In general, Korean [r] is not regarded as a phoneme, but is an allophone of the phoneme /l/, which is distributed to appear only in the onset position. This explains why stem final r does not alternate before vowel-initial suffixes but does alternate before consonant- initial suffixes.[13] r in the coda position is not viable in Korean and it is deleted.

(42) r-Deletion

```
                    N'
                    |
                    x
                    |
    r  ---> Ø  /  ____
```
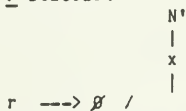
Since r-Deletion (42) refers only to the segmental plane, the x slot for r remains empty. Take, for instance, the connective form kə:k-k'o in (39a).

(43)

```
   ┌┌   N"    ┐  N" ┐                      N"        N"
   ││    ↑    │  ↑  │                       ↑         ↑
   ││   N'    │ /N' │   r-Del.            N'        /N'
   ││  ↑      │  ↑  │                      ↑         ↑
   ││  N      │ / N │   (42)               N       / N
   ││  ∧      │  ↑  │                      ∧         ↑
   ││ x x x x │ x x │                    x x x x   x x
   ││ ↓ ∨ ↓  │ ↓ ↓ │   ---->            ↓ ∨ ↓    ↓ ↓
   └└  k ə  r ┘ k o ┘                    k   ə    k o
```
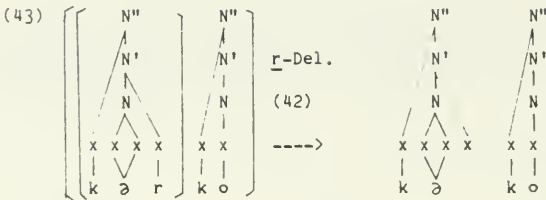
Now, the output of r-Deletion in (43) is of exactly the same
structure as the /s/-irregular verbs where [-N] Redundancy Rule (34)
applies (refer to the derivations in (35) and (36)). The rest of the
derivation of the correct form kə:k-k'o is as follows:

(44)

```
              N"        N"                              N"        N"
              ↑         ↑                               ↑         ↑
[-N] Red.    /N'       /N'      Tens(13)               /N'       /N'
             ↑          ↑                               ↑          ↑
(34)         N         / N      Ass. (16)               N        / N
             ∧          ↑                               ∧          ↑
            x x x x   x x                             x x x x   x x
  --->      ↓ ∨ ↓    ↓ ↓        ---->                 ↓ ∨ ↓    ↓ ↓
            k ə [t]  k o                              k ə k    k'o
```
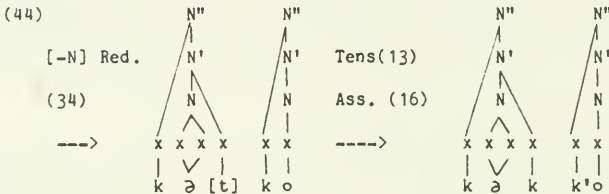
Deletion of r in coda position creates an environment where [-N] Redundancy
Rule (34) applies. The application of [-N] Redundancy Rule (34) is made
possible, since r-Deletion (42) refers only to the segmental plane
excluding the skeletal tier, and as a consequence, the x slot remains.
Since the linear phonological representation wipes out the x slot as well
as the segment r by rule (42), the assumption of the nonlinear phonological
representation is essential.

The alternation between r and t in the /t/-irregular verbs is thus
accounted for by postulating /r/ as an underlying stem-final consonant and
by making crucial reference to its position in the syllable structure.

Before closing discussion of /t/-irregular verbs, the effect of adding
/r/ to the Korean phoneme inventory needs to be discussed. Postulating /r/
as the stem-final consonant in /t/-irregular verbs greatly simplifies the
grammar at the cost of increasing the number of the phonemes. Although the
distribution of r and l as allophones of the phoneme /l/ is completely
predictable, it has been pointed out by Korean phonologists that r needs to
be a phoneme. If /r/ is posited as an underlying phoneme, the grammar is
more simplified, since /l/ is replaced with /r/ in the onset position, and
hence the application of a rule, l --> r / V __ V, can be largely
economized. Moreover, in the unmarked case, a language has nonlateral
consonants as well if it has lateral consonant in the underlying phoneme
inventory. It is also the case in Korean since all the underlying
consonants are nonlateral except l. Therefore, it is anything but arbitrary
to postulate /r/ in the underlying phoneme inventory. The phoneme /r/ is
only constrained in its position in the syllable due to the surface

constraint of Korean, *N'.
                   |
                   x
                   |
                   r

4.3. /p/-Irregular Verb

The so-called /p/-irregular verb shows alternations as in (45), while
the regular counterpart stays unaltered as already shown in (20).

(45)   Nom.   Effect.   Honor.   Propos.   Formal.
   a. kou–m   kou-ni   kou-si   kou-psi   ko:p-s'⁺pni
   b. kuu–m   kuu-ni   kuu-si   kuu-psi   ku:p-s'⁺pni
   c. miu–m   miu-ni   miu-si   miu-psi   mip-s'⁺pni

       Ind.   Conn.   Stat.   Gloss.
   a. ko:p-t'a   ko:p-k'o   kow-a   `to be beautiful'
   b. ku:p-t'a   ku:p-k'o   kuw-a   `to roast'
   c. mip-t'a   mip-k'o   miw-a   `to be hateful'

The /p/-irregular verbs show a rather complex alternation between p
and w or u. The analysis of this class of verbs follows Kim (1971), in
assuming that the underlying representation of the stem final consonant for
this class of verbs is /w/. Thus, the underlying representation of
p-irregular verbs is like (46b).

(46) a. regular verb   b. irregular verb
          N   N
          | /\
        x x x   x x x x
        | | | | |/ |
        k o p `to be numb'        k o  w `to be beautiful'
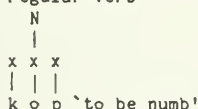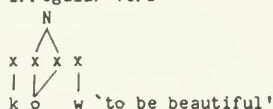
(46a) and (46b) are the underlying representations of the regular stem in
(20a) and the irregular stem in (45a) respectively.

What is to be accounted for in these data is the vowel length
alternation and the w and p alternation. Let's take, for example, the
effective, formal, and stative forms in (45a). The lexical entries are as
follows:

(47) a.   b.   c.
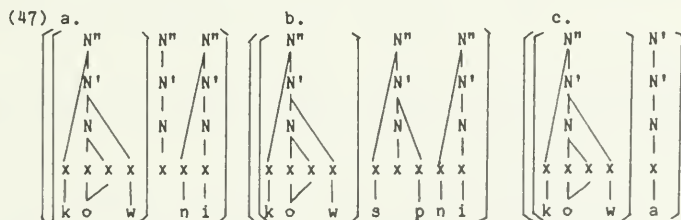
In the first cycle Syllable Building rules (4) build syllable structure.
In the three representations in (47), ⊗-Deletion (25) does not apply
because the stem-final N' node is branching. Vowel Shortening (21) applies

to (47a,c) since the suffixes begin with vowel. In (47b), the stem-final
branching N' node blocks the application of s-Deletion (26), and hence the
structural description of Vowel Shortening is not met. Resyllabification
applies at the end of each cycle. The verbal forms in (47) are represented
as (48) when the lexical stratum is exhausted.

```
(48) a.   N"    N"  N"    b.   N"         N"    N"    c.   N"        N"
          /\    /\  /\         /\         /\    /\         /\        /\
         /N'   /N' /N'        /N'        /N'   /N'        /N'       /N'
        / |   / |   |        / |         /\    |         / |       / |
       / N  / N  / N        / N        / N   / N        / N      / N
      / | / |  / |         / |         /\    / |        / |      / |
      x x x  x x x         x x x x   x x x x x        x x x      x
      | | |  | |           | \/ |    | | | | |        | | |      |
      k o w  n i           k  o w s  p n i            k o w      a
```
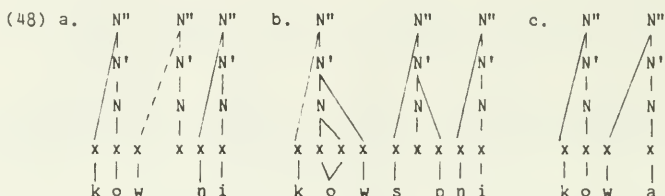
In the postlexical cycle, w in (48) is unspecified with respect to the
categorial feature. However, it is underlyingly specified with the feature
[round], which is to be incorporated into nucleus [14] immediately before
another nucleus by Nucleus Branching rule (49).

(49) Nucleus Branching

```
              N'
             /\
            / N'
           /  |
          /   N
         /  --|
        x--   x
        |
     [+round]
```
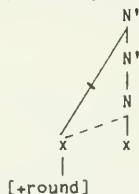
Nucleus Branching (49) creates a branching syllable nucleus, i.e. a
diphthong. The structural description of Nucleus Branching (49) is met in
(48a,c), but not in (48b). The newly-added nucleus node in (49) is
automatically assigned the categorial feature [+N] by Nucleus [+N]
Assignment (1). Thus, we derive the correct stative form kow-a by applying
Nucleus Branching (49) to (48c).

In (48a), however, the structure derived by Branching Nucleus (49) is

```
          N
         / |
        x  Ⓧ
        |
    [+round]
```

, which is possible neither as a long vowel (6b) nor as a
diphthong (6c). Thus, the branching nucleus is reduced to a nonbranching
one by deleting the unspecified nucleus x slot.

(50) Monophthongization

```
                    N
                   /|
    Ⓧ  --->  ∅  /  x ___
                   |
              [+round]
```
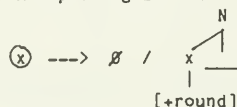
Monophthongization (50) spells out the nucleus x slot with the vowel u̠.
Thus, we derive the correct effective form kou-ni by applying Nucleus
Branching (49) and Monophthongization (50) to (48a). However, the
structural description of Monophthongization (49) is not met in the
representation of the stative form in (48c) since the second x slot in the
syllable head is underlyingly specified with a feature (I am assuming
[+low]), and the branching nucleus makes a well-formed diphthong structure.

w̠ in (48b) is attached to the N' node and the categorial feature [-N]
is assigned by Default [-N] Assignment (2). Thus, it is represented as
[+round]_N', which is phonetically realized as p̠. The application of
Tensing (43), along with the phonetic realization of p̠ from [+round]_N',
derives the correct formal form ko:p-s'+pni.

In the derivation of the stratum I verbal forms except the formal
form, the suffix-initial syllable nucleus is deleted not by the lexical
rule Ø-Deletion (25) in stratum I, but by the postlexical rule
Monophthongization (50). If the suffix-initial nucleus were deleted by
Ø-Deletion (25), the structural description of Vowel Shortening (21) would
not be met and the length of the stem vowel would not be affected by the
rule.

In the following derivation (51) of the nominal form kou-m, the stem
vowel becomes shortened by the suffix-initial nucleus which remains at the
end of the lexical cycle.
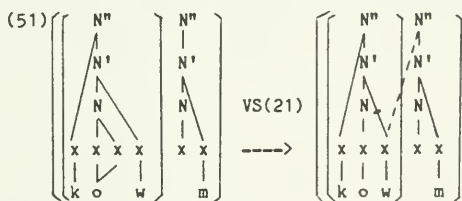
Nucleus Branching (49) and Monophthongization (50) apply prior to [+N]
Redundancy Rules (12) in the postlexical cycle, and the correct form kou-m
is derived. This explains why the stem vowel length has shortened even
though the suffix-initial vowel does not surface and the suffix begins with
a consonant in the derived forms.

The account of the alternations in the /p/-irregular verbs makes
crucial use of underlying representation like (46b), underspecification of
segmental features as well as categorial features, and their interaction
with position in the syllable structure.

Before closing this section, one more point needs to be discussed
about the alternation between w̠ or u̠ and p̠. The fact that the underlying
/w/ alternates with either the vowel u̠ or the consonant p̠ provides
substantial evidence that the labial consonants and round vowels share some
articulatory feature "representing constriction of the lips" (Walli 1984).
In order to properly account for the phonological behavior represented by
the alternations in /p/-irregular verbs, I suggest that the feature

[labial] is more appropriate than [round].

4.4. /÷/-Irregular Verb

It has been noted in 3.4. that vowel-final stem verbs show regularity
in their verbal paradigm. In the previous discussion of vowel-final verbs,
verbs whose stems end with the vowel ÷ were omitted intentionally. This
class of verb is regarded as one of the irregular types in Korean
traditional grammar. In this section, I argue that ÷-final verbs are as
regular as the other vowel-final regular verbs. Verbs in (52) belong to
this class of verbs.

(52) Nom.   Effect.   Honor.   Propos.   Formal.
   a. yep'-÷m   yep'-÷ni   yep'-÷si   yep'-÷psi   yep'-÷pni
   b. k'-÷m   k'-÷ni   k'-÷si   k'-÷psi   k'-÷pni
   c. th-÷m   th-÷ni   th-÷si   th-÷psi   th-÷pni

   Ind.   Conn.   Stat.   Gloss
   a. yep'÷-ta   yep'÷-ko   yep'-a   `to be pretty'
   b. k'÷-ta   k'÷-ko   k'-a   `to extinguish'
   c. th÷-ta   th÷-ko   th-a   `to come out'

When we compare the ÷-final verbs in (52) with other vowel-final verbs in
(23), we find that what stigmatizes ÷-final verbs as irregular is the
absence of stem-final vowel ÷ before the stative suffix a. The stem of
this class of verbs ends with the vowel ÷, since otherwise, ÷ in the
indicative and connective forms is not motivated. The absence of s in the
formal form also supports the claim that the stems of the verbs in (52) are
vowel-final. Thus, I suggest (53) as the underlying representation of the
stem in (52a):

```
(53)    N   N
        |   |
      x x x x
      | | |
      y e p'
```

Assuming the underlying representation (53), the derivation of the
indicative and connective forms in (52) is straightforward since no rule
applies but [+N] Redundancy Rules (12) to fill in the stem-final
featureless x slot. Thus, yep'÷-ta and yep'÷-ko are derived.

In case of the verbal forms whose suffixes begin with unspecified
nucleus, the structural description of Contraction (28) is met. The
effective form yep'-÷ni in (52a), for instance, is underlyingly represented
as (54a):

```
(54) a. ⎡⎡  N"   N" ⎤ N"   N" ⎤           b.     N"     N"    N"
     ⎢⎢  /\   /\ ⎥ |    |  ⎥                    /\     /\    /\
     ⎢⎢ N'   N' ⎥ N'   N' ⎥ Contr.            N'    N'    N'
     ⎢⎢ |    |  ⎥ |    |  ⎥                    |     |     |
     ⎢⎢ N   /N  ⎥ N    N  ⎥ (28)               N     N    /N
     ⎢⎢ |  / |  ⎥ |    |  ⎥                    |    /|   / |
     ⎢⎢ x x x x ⎥ x x x  ⎥ ---->              x x x  x x x
     ⎢⎢ | | |   ⎥   | |  ⎥                    | | |  | | |
     ⎣⎣ y e p'  ⎦   n i  ⎦                    y e p' [÷]n i
```
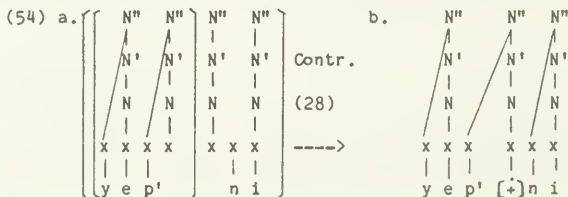
Contraction (28) is applicable to (54), since the two nucleus nodes across
morpheme boundary are of the same representation (following the notational
conventions in Pulleyblank (1983)) whether it is specified or unspecified
with respect to the feature matrix. The remaining empty nucleus x slot is
filled by [+N] Redundancy Rules (12), deriving the correct form yep'-+ni.
Thus, deletion of [+] in the nominal, effective, honorific, and propositive
forms [15] is taken care of by Contraction (28), as seen in the discussion of
vowel-final verbs.

In case of the stative forms in (52), the stem-final vowel is deleted.
The deletion of the stem-final vowel + is basically the same process as
that of the suffix-initial vowel + in the vowel-final regular verbs shown
in 3.4., in the sense that the unspecified nucleus x is deleted when
abutting another nucleus x slot.

We are thus in another position to provide evidence for the
underspecified feature representation. ⓧ-Deletion (25) shows a potential
for a mirror image rule since the unspecified nucleus x slot is deleted
when abutting a specified nucleus x slot. That is, precise determination
of vowel deletion is dependent upon the vowel quality, but not upon linear
order in the vowel sequence. The evidence for the rule (25) being a mirror
image rule is provided with respect to the stative forms in (52).

The mirror image version of ⓧ-Deletion (25) is (55):

(55) ⓧ-Deletion

$$\text{ⓧ} \dashrightarrow \emptyset \ / \ \underline{\quad} \left.\begin{array}{c} \\ \\ \end{array}\right\rangle \begin{array}{c} N \\ | \\ x \end{array}$$
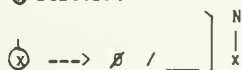
Two adjacent syllable nuclei are not possible with an intervening morpheme
boundary, if one of these nuclei is featureless.

The derivation of the stative form yep'-a in (52a) is as follows:

(56) a.

```
        N'''  N'''  N'''          b.     N'''   N'''
         |     |     |                     |      |
        N'    N'    N'      ⓧ-Del         N'     N'
         |     |     |                     |      |
         N     N     N       (55)          N      N
         |     |     |                     |      |
        x x x x     x       --->          x x x   x
        | | |       |                     | | |   |
        y e p'      a                     y e p'  a
```
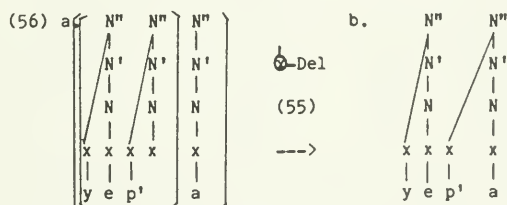
In (56a) the last two syllable nuclei are adjacent. Since the stem-final
nucleus is unspecified at the point of rule application, it is deleted.

To avoid the clash of two nuclei, Korean phonology chooses [16] to delete a
syllable nucleus. The vowel to be deleted in a vowel sequence is
determined by whether there is a nucleus which is not specified with
respect to the feature matrix, as it is in the deletion of suffix-initial
vowel +. Within the framework of underspecification, it does not cost for

x̣-Deletion (25) to be a mirror image rule (55) since what counts is not the
precedence of certain features but the presence or absence of feature
specifications.

The reason this class of verbs is marked as irregular is that the
stem-final vowel ɨ̣ is deleted, while no other vowels in that position are
deleted as shown in vowel-final regular verbs in 3.4. However, x̣-Deletion
(25) and (55) which is motivated to account for the regular vowel-final
verbs, predicts the deletion of the vowel ɨ̲ in the verbal forms in (52).
What is involved in the stem-vowel deletion of the so-called /ɨ/-irregular
verbs is that their stem ends with an unspecified nucleus x slot in
underlying representation, and this is exactly what theory of
underspecification demands.

It is explanatorily inadequate to deal with deletion of the vowel ɨ̣ in
the same context as different processes: one as regular, the other as
irregular. Rather, all the vowel-final stems follow the regular verbal
paradigm: it is always the vowel [ɨ̣] that is vulnerable in a vowel
sequence. This phenomenon is accounted for in a simpler and more unified
manner within the framework of underspecification. Without recourse to
underspecification of features, the ɨ̣-deletion rule is more complex
describing all the features for the vowels in a sequence, and still the
phenomena of ɨ̣-deletion is accounted for in an ad hoc manner (Lee 1976).
Thus, the verbal forms whose stems end with a vowel provide substantial
support for the theory of underspecification of vowel features.

4.5. /l/-Irregular Verb

/l/-irregular verbs[17] show an alternation between l̲ and null.

(57)	Nom.	Effect.	Honor.	Propos.	Formal.
a.	kɔ:-m	ka:-ni	kə:-si	kə:-psi	kə:-pni
b.	mu-m	mu-ni	mu-si	mu-psi	mu-pni
c.	tɨ-m	tɨ-ni	tɨ-si	tɨ-psi	tɨ-pni

In the Stratum II affixes, we see /l/ surfacing:

(58)	Ind.	Conn.	Stat.	Gloss
a.	kə:l-ta	kə:l-ko	kər-a	`to hang'
b.	mul-ta	mul-ko	mur-a	`to bite'
c.	tɨl-ta	tɨl-ko	tɨr-a	`to hold up'

The stem-final consonant r̲ in the stative is the alternant of l̲ in
intervocalic position.

We may hypothesize the underlying representations of the stems in (57)
and (58) as:

```
(59) a.     N           b.    N        c.    N
            /\                 |              |
       X X X X            X X X          X X X
       |  V  |            | | |          |   |
       k  ə  l            m u l          t   l
```

For the stratum II suffixes, the only applicable rules are intervocalic /l/-weakening to r and Vowel Shortening (21). The verbal forms with the stratum I affixes in (57) systematically have no stem-final consonant l present in the surface structure: I suggest a rule deleting /l/ in these forms. The stem-final l is deleted before m, n, p, or s. That is, the deletion of the stem-final l is not conditioned by a natural class. Thus, the environment of /l/-deletion makes crucial reference to the notion of stratum in Korean verbal morphology.

(60) l-Deletion[18]

$$x \longrightarrow \underset{\mid}{\circledX} \; / \; \underline{\quad}]_w$$
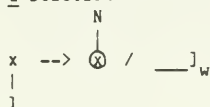
, where w ≠ ∅   (Domain: Stratum I)

With this rule the stem-final l is deleted, changing the thus empty x slot into nucleus x slot, whenever it is followed by a morpheme in stratum I. Since the stem-final x slot in the skeletal tier is assigned a syllable nucleus, the verbal stem behaves as if it were an ɨ-final stem (compare with the verbal forms in (52)). Thus, l-Deletion (60) creates an environment for contraction (28).

In discussion of /ɨ/-irregular verb, it has been pointed out that there is an indeterminacy as to which vowel is to be deleted when both the stem-final and suffix-initial vowels are unspecified. We are now in a position to discuss the evidence that contraction rule (28) truncates stem-final vowel over suffix-initial one. The propositive form ka:-psi in (57a) is derived as follows:

(61)
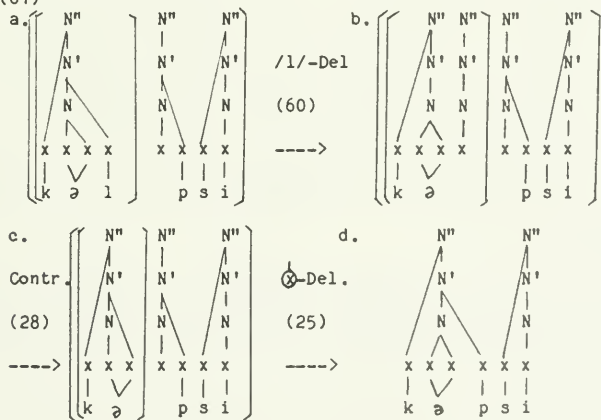
In (61b) there are two unspecified nuclei across morpheme boundary, meeting the structural description of contraction (28). If the suffix-initial nucleus is deleted by contraction (28), then the unspecified stem-final nucleus can not be deleted after another specified nucleus because there is

no morpheme boundary. Therefore, contraction rule (28) must delete the stem-final vowel, as shown in (61).

The formal form ka:-pni in (57a) is derived as follows:
(62)

```
a.                                        b.
  ⌈⌈   N"        ⌉  N"    N" ⌉              ⌈⌈   N"    N"  ⌉  N"     N" ⌉
  │    ∧         │  ∧     ∧  │  /l/-Del     │    ∧     │     ∧      ∧  │
  │   /N'        │ /N'   /N' │              │   /N'   N'    /N'    /N' │
  │   /∧         │ /∧     │  │  (60)        │    │     │     /∧      │  │
  │  / N         │/ N   / N  │              │   / N    N   / N      N  │
  │  /∧          │/│\  / │   │  --->        │  /∧      │  / │       │  │
  │ x x x x      x x x x x   │              │ x x x x  x x x x x       │
  │ │ ∨ │        │ │ │ │ │   │              │ │ ∨      │ │ │ │         │
  ⌊ k ə l        s p n i ⌋                  ⌊ k ə      s p n i ⌋

c.                                        d.
  ⌈⌈      N"  N" N"     N"  ⌉   s-Del        N"          N"
  │       ∧   │  │      ∧   │                ∧           ∧
  │      /N'  N' N'    /N'  │   Contr.      /N'         /N'
  │      / │  │  │      │   │   Ⓧ-Del.      / │          │
  │     / N  N  N      N    │   (28),(25)  / N          / N
  │    /∧    │  │\     │    │               /∧          │
  │   x x x x    x x x x    │   --->       x x x  x x x
  │   │ ∨ │     │ │ │ │     │              │ ∨    │ │ │
  ⌊   k ə       p n i ⌋                    k ə    p n i
```
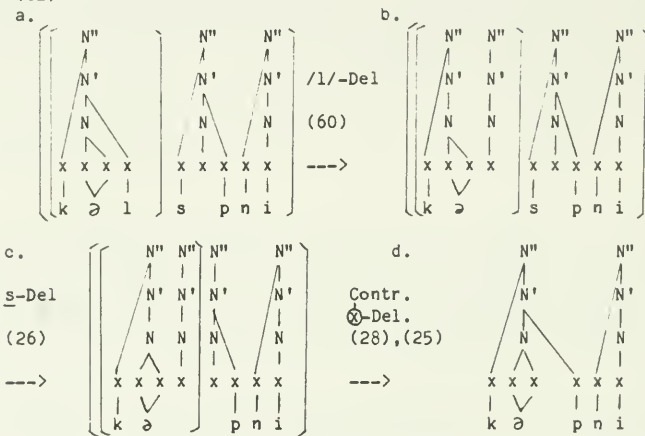
Verbal forms in stratum II do not show any alternation except for the postlexical rule of weakening l into r in intervocalic position.

When we compare the verbal forms in /t/-irregular verbs in (39) with those in /l/-irregular verbs in (57) and (58), we find a striking difference in spite of the identical forms in the stative. Unlike the /t/-irregular verb, the /l/-irregular verb behaves as though the stem has a non-branching N' node. That is, /l/-irregular verbs follow the same verbal paradigms as /ɨ/-irregular verbs when followed by stratum I verbal suffixes. The application of Ⓧ-Deletion (25), however, blocks the application of Vowel Shortening (21), since the morphemes in stratum I no longer begin with syllable nucleus at the point of the application of the rule (21). l-Deletion (60) applies in the beginning of stratum I, followed by s-Deletion (26). The application of these two rules feeds contraction (28) and Ⓧ-Deletion (25).

The l-Deletion (60) before certain morphemes in /l/-irregular verbs can be accounted for only by appealing to the notion of stratum. Basically, it is also this rule that determines the applicability of contraction (28), Ⓧ-deletion (25), and Vowel Shortening (21).

4.6. /lɨ/-Irregular Verb

/lɨ/-irregular verbs are labeled so because ll appears instead of lɨ in the stative form. In the other verbal forms, the phoneme /l/ in lɨ weakens to r since it is in intervocalic position.

(63) Nom.   Effect.   Honor.   Propos.   Formal.
  a. kər-ɨm   kər-ɨni   kər-ɨsi   kər-ɨpsi   kər-ɨpni
  b. mur-ɨm   mur-ɨni   mur-ɨsi   mur-ɨpsi   mur-ɨpni
  c. kur-ɨm   kur-ɨni   kur-ɨsi   kur-ɨpsi   kur-ɨpni

      Ind.   Conn.   Stat.   Gloss
  a. kərɨ-ta   kərɨ-ko   kəll-a   `to filter'
  b. murɨ-ta   murɨ-ko   mull-a   `to be soft'
  c. kurɨ-ta   kurɨ-ko   kull-a   `to roll'

The underlying representation of the stem in (63a) is (64).

(64)   N
          |
        x x x x
        | | | |
        k ə l l

With the underlying representations like (64), /lɨ/-irregular verbs
follow the same paradigm as /l/-irregular verbs. The formal form kər-ɨpni
in (63a) is derived as follows:

(65)
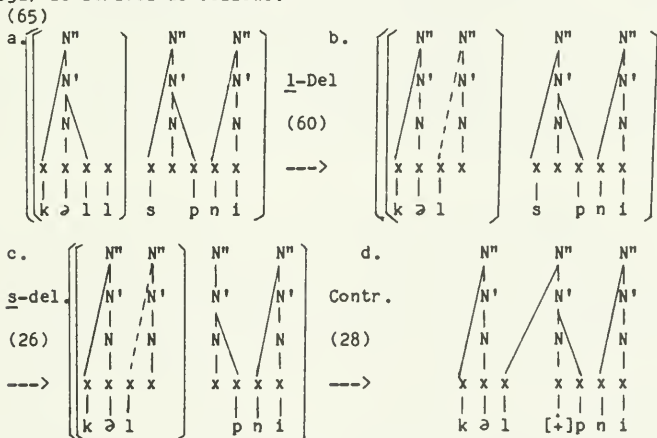
In (65b), stem-final l is deleted and the empty x slot becomes syllable
nucleus by l-Deletion (60) since it is followed by stratum I suffix. As a
consequence, the verbal stem behaves like a verb whose stem ends with vowel
ɨ, and s-Deletion (26) applies. By deleting s, two identical syllable
nuclei are left adjacent across morpheme boundary, as shown in (65c). The
application of contraction (28) derives the corret form kər-ɨpni.

In the derivation of a formal form in (65), it has been shown that
/lɨ/-irregular verbs follow the same derivational processes as
/l/-irregular verbs (compare the derivation in (65) with the one in (62)).
The account of the /lɨ/-irregular verbal forms makes use of rules necessary
to account for /l/- or /ɨ/-irregular verbs, assuming the underlying

representation like (64). That is, both Ⓧ-Deletion (25) and 1-Deletion (60) are motivated independently of /1ɨ/-irregular verbs.

In case of stratum II verbal forms, 1-Deletion (60) does not apply, just as it does not in /1/-irregular verbs, since the domain of 1-Deletion (60) is restricted to stratum I. Thus, the derivations of the stative and connective forms kəll-a and kərɨ-ko are as follows:

(66) a.
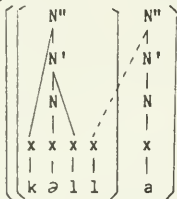
b.
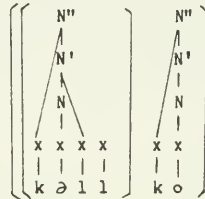
In (66a,b), no rule is applicable in the second cycle and resyllabification applies at the end of the cycle. Thus, the stative form kəll-a is derived in (66a) with no more rule to apply at the postlexical cycle.

In case of (66b), however, resyllabification applies at the end of the lexical cycle and leaves an unsyllabified x slot linked to 1. In the postlexical cycle the unsyllabified x slot linked to 1 is syllabified as a nucleus node losing its feature 1 [19].

(67) Nucleus Assignment
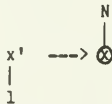
By assigning nucleus node to the unsyllabified x slot the unsyllabified x slot is syllabified.

The unsyllabified x slot at the end of the second cycle in (66b) is syllabified as nucleus of an empty x slot. Nucleus Assignment (67) derives (68) from (66b).

(68)
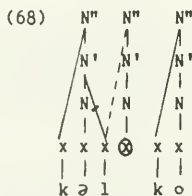
[+N] Redundancy Rules (12) fill in the derived empty x slot in (68) and resyllabification applies at the end of the postlexical cycle.

Intervocalic <u>l</u> becomes <u>r</u> and the correct form <u>kər̴-ko</u> is derived.

In spite of the contribution that the underlying representation like (64) for the /lɨ/-irregular verbal stem makes toward a simplified grammar, the underlying representation in (64) remains problematic: the representation (64) is less highly valued according to the McCarthy's (1981) revised version of Obligatory Contour Principle (OCP), since there are two adjacent x slots of identical segment <u>l</u>. On the other hand, if the underlying representation of /lɨ/-irregular verbs are like (69), meeting OCP,

(69)   N
       |
     x x x x
     | | ∨
     k ə l

then, there is a difficulty in applying <u>l</u>-Deletion (60) and Nucleus Assignment (67). These rules allow only one half of the geminate structure to undergo the structural change, which is strongly rejected by phonologists: Kenstowicz (1982) defends geminate structure constraint at the cost of reducing the OCP to a language specific parameter. Steriade and Schein (1984) make the geminate structure constraint even stronger in case the geminate structure itself is the "target", rather than the "context", of the rule. Following their assumption that the geminate structure constraint is not to be violated, the present analysis chooses without further language specific evidence the underlying representation like (62) violating the OCP, over the underlying representation like (67) violating the geminate structure constraint.

To summarize the discussion of the /lɨ/-irregular verbs, they behave like /ɨ/-irregular verbs in stratum I due to the application of <u>l</u>-Deletion (60) as /l/-irregular verbs do. It has already been argued that /ɨ/-irregular verbs are as regular as other vowel final verbs. Therefore, it follows that neither/l/- nor /lɨ/-irregular verbs are irregular. The regularity of the /lɨ/-irregular verbs are accounted for with reference to the nonlinear underlying representation like (64), the syllable structure, and the lexical stratum.

4.7.Summary

It has been argued that the so-called irregular verbs are different from the regular verbs in their underlying representations, and that as a consequence, the structural descriptions of rules are not met in the irregular verbs though they are met in the regular verbs. This line of deeper phonological distinction is made possible by nonlinear phonological representations.

In addition to the rules needed to account for the alternations in the regular verbs, the so-called irregular verbs require the following rules: as a lexical rule, <u>l</u>-Deletion (60) applies in stratum I. The mirror image version (55) of Ⓧ -Deletion (25) also applies in the lexical cycle. Among the postlexical rules are [-N] Redundancy Rule (34), Glide Formation (37), <u>r</u>-Deletion (42), Nucleus Branching (49), Monophthongization (50), and

Nucleus Assignment (67).

Lexical rules of 1-Deletion (60) and s-Deletion (26) which are
specified with respect to the domain of rule application must apply in the
beginning of each cycle in stratum I. Of those two rules, 1-Deletion (60)
applies first, feeding s-Deletion (26). These two rules feed contraction
(28) and Ⓧ-Deletion (25), blocking the application of Vowel Shortening
(21).

When the lexical cycle is exhausted, postlexical rules apply. They
apply as soon as their structural descriptions are met. Thus, no extrinsic
ordering is necessary. For example, r-Deletion (42) creates the
environment for [-N] Redundancy Rule (34), and Nucleus Assignment (67)
feeds [+N] Redundancy Rules (12). When the structural descriptions for
both Tensing (13) and Assimilation (16) are met, Tensing (13) must apply
prior to Assimilation (16) so that the one feeds the other. The reverse
ordering bleeds Tensing (13) since the application of Assimilation (16)
creates a geminate structure and the application of Tensing (13) violates
the geminate structure constraint, allowing only one half of the geminate
structure to undergo the structural change. Resyllabification applies in
the postlexical as well as lexical cycles, since it applies at the end of
each cycle.

The two redundancy rules (12) and (34) are intermingled to interact
with other phonological rules. The two rules Nucleus [+N] Assignment (1)
and Default [-N] Assignment (2), which are concerned with the categorial
features [+N] and [-N], also interact with redundancy rules on the one
hand, and with other phonological rules such as Nucleus Branching (49) and
Monophthongization (50) on the other.

5. Conclusion

The nonlinear analysis of Korean irregular verbs illuminates a
phonological regularity in the verbal system which was obscured in previous
linear accounts. The allocation of the surface phonetic contents into
separate planes gives room for differentiating the regular and irregular
verbs in their underlying representation. Since the phonological rules in
the framework of nonlinear representation make reference to syllable
structure, the skeletal tier, and the lexical strata, in addition to the
underlying phoneme, the regularity of the irregular verbs as well as the
regular ones is accounted for. Therefore, in nonlinear analysis, two
different types of verbs are differentiated by the underlying
representation without appealing to lexical exceptions to rules or using
other non-phonological diacritics.

From the theoretical point of view, the present analysis supports
several recent theoretical issues. First, the idea of featureless x slot
in the skeletal tier in Clements and Keyser (1983) is examplified in the
behavior of the /s/-irregular verb. The alternations in this class of
verbs are best treated by assuming a stem-final empty x slot.

Secondly, the theory of underspecification allows rules to be
formulated in a simpler way. The notion of specifying only marked features
in the underlying representation whether the value is + or -, and the

interaction between the redundancy rules for the unspecified slot and the other phonological rules, provide a principled way of accounting for the deletion of the vowel i̵.

A ramification of underspecification of features accounts for why the diphthongs *wi̵ and *yi̵ are systematically excluded in Korean. Since the unspecified x slot in the branching nucleus node is deleted by Monophthongization (50), these structures cannot surface as diphthongs.

Thirdly, the notion of lexical stratum is crucial in accounting for the regular phonological processes at a deeper level. Without the notion of stratum, the alternation before certain classes of suffixes is viewed to be conditioned by segments which do not constitute a natural class, and hence, becomes explanatorily inadequate.

Finally, I suggest that the feature [labial] is more appropriate than [round] in capturing the phonological altenation between the round vowel and the labial consonant as well as in defining the articulatory characteristics.

NOTES

[*] For the preparation of this paper I was greatly helped by Professor Diana Archangeli with her insightful comments and suggestions through marathon discussions. I thank Professor C.-W. Kim for his critical comments. I would also like to express my appreciation to Jean D'souza for helping me to crystallize and refine the ideas herein. I am, however, solely responsible for any problems which remain.

[1] The Korean orthography, which used to be regarded as representing the underlying phoneme, has been used to name the irregular verbs. Although this traditonal labeling may be misguided, the labels in this paper follow it.

[2] Mohanan (1981) allows for a "loop". That is, stratum n feeds into stratum n+1 as usual, but it also feeds into stratum n-1.

[3] Neutralization in Korean also involves the neutralization of aspiration and tense into unmarked features in syllable final position. However, this process is not crucial to the present analysis, and it is not specified in Neutralization (14).

[4] It can be claimed in general that the least marked vowel is more likely to be truncated or inserted in the hierarchies of deletion and epenthesis processes. For further discussion, see Archangeli (1984) and Sohn (to appear).

[5] The underlying representation of the stative suffix is /ə/. The representation of a̱ for the stative suffix is mainly used for typographical convenience. However, /ə/ becomes a̱ by Vowel Harmony when the stem-final vowel is a̱ or o̱. We do not go into discussion of Vowel Harmony since it is not relevant in this paper.

[6] There is indeterminacy at this point as to which one of the two identical slots is to be deleted by contraction (28): the stem-final or the suffix-initial nucleus. Preference to the first is argued in the derivation of (61) in /l/-irregular verbs.

[7] The traditional Korean orthogrphic system, which is generally regarded as a reflex of Korean phonemes, dictates that the stem of /s/-irregular verbs be represented with s̲ when it is followed by consonant-initial suffix. But s̲ is n̄ot present orthographically when followed by vowel-initial suffixes. This is why this class of verb is called irregular.

[8] The alternative way of filling in the empty x slot in coda position is to invoke Consonant Spreading from right to left:

```
   N'    N'"
   |     |
   X     X
    `~ ~ _|
      [ ]
```

The preference of [-N] Redundancy Rule (34) over Consonant Spreading is motivated by the resultant structure after the empty x slot is filled by spreading. Later application of Tensing (13) or Assimilation (16), which must be made in the derivation of this class of verbs, violates the geminate structure constraint (McCarthy 1981) by allowing only one half of the geminate structure to undergo the structural change.

[9] I suppose that [-N] Redundancy Rule (34) is a more general rule in Korean, accounting for the tensification phenomenon where an obstruent is tensed without any preceding tense-triggering consonant. Recall the general Tensing (13): an obstruent is tensed when preceded by another obstruent.
/na-ka/ `riverside' is realized as /nak'a/ with a tensed obstruent. If the tensification in compounding is reduced to insertion of an empty x slot between the first and second morphemes, then the empty x slot in coda is filled by [-N] Redundancy Rule (34) triggering tensing of the following obstruent.

```
x  x   x  x   --> x x[x]x x   --> x x x x x -->   x x x x x
n  æ   k  a       n æ   k  a       n æ[t]k a       n æ k k'a
```
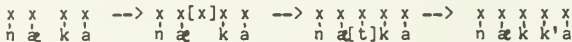
Tensing (13) and Assimilation (16) apply in the last step of of derivation.

[10] The feature matrices in Glide Formation (37) are not described in terms of underspecification of features because the whole picture of underspecification of vowels is not elaborated at this point. Roughly speaking, the vowel i̲ is specified with [-back], and u̲ with [+round]. Unlike the SPE theory in which i̲ and u̲ constitute a n̄atural class represented as [+high, +sonorant], underspecification of features does not allow for the natural class of these two vowels. However, these two vowels are differentiated from other vowels in that they are not specified with categorial feature in the underlying representation. They are differentiated from consonants in that they are possible syllable nuclei.

Thus, Glide Formation (37) can be reformulated in terms of underspecification as follows:

(37)' Revised Glide Formation

```
   N _ _ N
   |     |
   X     X
  [ ] [ ]_+N
```
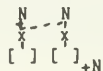
The empty bracket [ ] refers to a specified feature matrix attached to x slot. With this formulation, Glide Formation (37)' must apply prior to Nucleus [+N] Assignment (1) since it crucially refers to whether the specified feature under N node is specified with the categorial feature.

[11] In Middle Korean the irregular verb cis `to make' has /s/ as a stem final phoneme. Historically, the voiceless fricative s has either changed to voiced z which eventually disappears, or remained unchanged.

The /s/-irregular verbs in (30) follow the former type of historical change when followed by vowel-initial suffix, while they follow the latter type when followed by consonant-initial suffix. Therefore, assuming /cis/ or /ciz/ as the underlying representation of cis does not solve the problem of explaining two alternations that a single underlying phoneme shows. Moreover, it is explanatorily inadequate in the synchronic grammar since there is a class of verbs as in (10) whose stem-final s does not become silent before vowel- initial suffix.

Furthermore, it is not likely that a child acquires a language on the basis of the historical model. Therefore, there is no /s/ present in the underlying representation of this class of verbs.

[12] I follow Kim (1971) in assuming that the stem-final consonant of the /t/-irregular verb is /r/.

[13] r-Deletion (42) was suggested to me by Professor Diana Archangeli, whose insight captured the similar processes going on in the derivations of /s/- and /t/-irregular verbs in Korean.

[14] Nucleus Branching is independently motivated with respect to the syllable structure of Korean. As in Spanish (Harris 1983), glides y and w in Korean are not onset but parts of nuclei. For further argument, see Sohn (to appear).

[15] As mentioned in note 6, there still remains indeterminacy on deleting a vowel by contraction (28).

[16] Refer to note 4.

[17] /l/-irregular verbs, unlike the already discussed irregular verbs, do not have regular counterparts.

[18] l-Deletion is an independently motivated phenomenon when l is a morpheme-final consonant and it is followed by another morpheme. First, l in the reduplicated morpheme is deleted. Some adverbs in Korean are derived by reduplication of a noun. i in the following two examples is an adverbial marker.

    a. tal `month' /tal+tal+i/ --> ta-tal-i `every month'
    b. nal `day' /nal+nal+i/ --> na-nal-i `every day'
Secondly, Verbal Compoundings show l-deletion.
    c. yəl `to open' /yəl+tat/ --> yə-tat `to open and shut'
    d. mil `to push' /mil+tat/ --> mi-tat `to slide-open'
Thirdly, noun compoundings also show l-deletion.
    e. sol `pine' + namu `tree' --> so-namu `a pine tree'
    f. pul `fire' + napi `butterfly' --> pu-napi `a tiger moth'
    g. pul `fire' + sap `shovel' --> pu-sap `a fire shovel'

According to 1-Deletion (60), 1 in these examples becomes ɨ, which will eventually derive incorrect forms. ɨ needs to be deleted.

In order to account for the phenomena above or /l/-irregular verbs the linear rule 1 --> Ø / __]ₘ (where w ≠ Ø) is sufficient. However, 1-Deletion formulated as (60) sheds light on the phonological alternation in /lɨ/-irregular verbs.

[19] The general way of taking care of unsyllabified x slot in Korean is deleting it, rather than epenthesizing a vowel. For example,

a.   b.
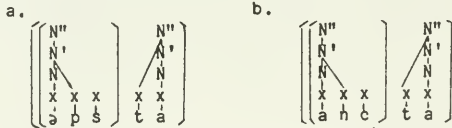
(a) and (b) above are derived as ap-ta `there is nothing' and an-ta `to sit' respectively.

However, when the unsyllabified x slot is a stop and the preceding syllabified x slot is not, the continuant x slot is delinked and the noncontinuant x slot is incorporated into a syllable.

c. [-continuant] Incorporation
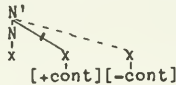
The derivations of pa:p-ta `to tread' and pak-ta `to be bright' are as follows:

d.   e.
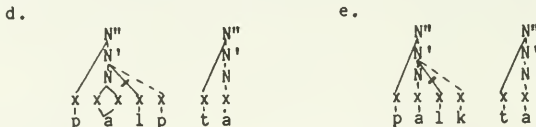
The unsyllabified x slot is syllabified delinking the already syllabified x slot, when the unsyllabified x slot is [-continuant]. Nucleus Assignment (67), however, is not applicable to the resultant unsyllabified 1 in (d) or (e) because it violates the Well-Formedness Condition that association lines do not cross. Thus, Nucleus Assignment (67) is not contradictory to other syllabification processes in Korean.

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Sex, Power and Linguistic Strategies in the Hindi Language

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This paper explores the complex relationship among
power, gender, and linguistic strategies in the
non-Western, Indo-Aryan language, Hindi. Examining
data from contemporary literary text-based Hindi
cross-sex conversations (Ashk 1976, Rakesh 1958, Verma
1964), evidence is provided that a differential use of
verbal interactional patterns is held by male and
female Hindi speakers, and that these linguistic
strategies are verbal expressions of strength or energy
which are interpreted and motivated differently by each
sex for the purposes of coordinating interaction and
achieving effective communication with each other.
Specifically, the discoursal strategies of
conversational topic initiation, maintenance, and
shift, gaining an appropriate response and establishing
a common theme, and the organizational devices used to
regulate and coordinate discussion are examined. It is
revealed that the female Hindi speakers are primarily
the maintainers and supporters of cross-sex
conversation and the male Hindi speakers are the
relators of events, conveyors of messages, and gainers
of information.

1.0 Over the past few years a considerable number of studies
has emerged on the sexual differentiation of language and speech,
shedding light on the complex, varied ways in which males and
females verbally interact with each other. The primary data and
research on cross-sex interaction come from actual conversations of
American couples (Fishman 1980, 1983; Leet-Pellegrini 1980; Sattel
1983; West and Zimmerman 1983; Zimmerman and West 1975). It is
shown that when women and men verbally interact as equals or
intimates they do not necessarily make use of the same discoursal
skills, nor do they play the same roles in cross-sex conversations.
By the examination of male-female discourse, gender differences in
such strategies as the patterns of topic initiation, interruption,
question asking, and conversational style, to name a few, emerge.
The explanation researchers offer for these verbal interactional
differences between the sexes is found in the interdependent
relationship among language, gender and power: the hierarchical
relations in cross-sex discourse are attributed to male-female power

relations in society. In view of the fact that the norms of
appropriate behavior in society establish and enforce the power and
control for men and are withheld from women, it is assumed that
males also control, dominate, and command power in cross-sex talk.
"Just as male dominance is exhibited through male control of
macro-institutions in society, it is also exhibited through control
of at least a part of one micro-institution" (Zimmerman and West
1975:125). Hence, power is seen as a measure of dominance which is
exercised by one language user over another. A powerful speaker is
one who directly and indirectly influences others through discourse.

As an alternative to viewing power as a restriction of freedom
and as the ability to control, dominate, and determine the goals and
behaviors of another, Hartsock (1981) suggests that power in
language discourse is 'energy, effective interaction, and
empowerment.' In verbal interactions "no compulsion is present
other than the force of discourse itself; domination is absent, and
reciprocity pertains between and among participants" (Elshtain
1982:620). In this sense power is not understood as a system of
dualism: powerful vs. powerless; dominating vs. dominated; and
winner vs. loser, but is presented as a strategy that affirms the
patterns found in females' and males' speech. Each speaker's act in
itself is an act of strength and energy. Power is effective
communication, an accomplishment understood to be satisfying in
itself.

Taking into account the view of power as energy, I examine its
relationship to language strategies in cross-sex conversation of the
non-Western language, Hindi. Such an exploration reveals how
discoursal work is done in cross-sex Hindi conversation, provides
evidence that different discoursal models are held by male and
female Hindi speakers, and suggests that these linguistic strategies
are acts of power used for the purpose of attaining and achieving
efffective communication. I provide detailed, illustrative examples
from literary text-based cross-sex conversations in the Hindi
language. Primarily data are drawn from three contemporary Hindi
works: one novel and two plays of well-known contemporary authors of
India (Verma 1964; Ashk 1976; Rakesh 1958, respectively), among
other Hindi short stories to substantiate my claims. Each creative
text contains conversations between intimate, heterosexual Hindi
speaking couples. I isolate what verbal strategies and skills are
used and examine how these particular linguistic patterns are
employed by male and female Hindi speakers in order to communicate
with each other. Specifically, I examine the strategies of
discourse topic initiation and the success rate in gaining an
appropriate response and in establishing a common theme, how this
discourse topic is maintained or shifted, and the organizational
devices used to regulate verbal contact and conversation. Analysis
reveals that these discoursal strategies function to ensure,

encourage, and direct conversation between the couples. The different use of these strategies by the Hindi speakers does not suggest that inequality of power exists in the verbal interaction between the sexes or is due to one of the parties exerting control over the other, but that each of the speakers exercise her or his power in conversation differently as a drive to interact effectively. I am making no claim that these patterns of cross-sex interaction are generalizable to live conversations in Hindi; no empirical investigation of natural actual speech has been done as yet.

2.0 One aspect of effective communication within the Hindi discoursal system of turn-taking is in initiation and maintenance of conversational topic. Evidence for the strength of topic initiation has been presented in many linguistic studies by analyzing the success rates of raising, adopting, and maintaining a topic in an on-going conversation (Coulthard 1977; Keenan and Schieffelin 1976; Sachs et.al., 1974; Soskin and John 1963, as well as the aforementioned research). An utterance is considered an initiation of topic when the subject raised is different from that of the preceding utterance. However, initiating a topic is only an attempt to get a discussion started, it does not necessarily guarantee that it is developed nor ensure that the theme is adopted and maintained in conversation. In order for a discourse topic to evolve into an actual discussion and be considered successful, both of the speakers must work and contribute to the topic's development. Not only must one participant raise the topic, but the other must respond, thus mutual orientation and direction is displayed to each other and to the topic at hand. Although topic initiation is a strategy available to both speakers in a cross-sex conversation, it is not motivated, understood, and interpreted similarly and the success rates differ.

With a possible gender differential usage of topic initiation and maintenance in mind, the following questions come into focus: 1. Does the female or the male Hindi speaker initiate discourse topic more often? 2. Who is more successful in gaining an appropriate response? and 3. Are there statistical and motivational differences in initiating discourse topic with a question or statement form? Firstly, from the cross-sex Hindi conversations examined a count of 118 discourse topics are raised. Of this, 60% are introduced by the male speakers and 40% by the female speakers. The male speaker is 83% successful in initiating topic, while the female speaker is 60% successful. It is evident that there is a clear difference between the sexes in successful initiation of conversational topic in these texts - the male speaker initiates topic more often and is more successful in gaining a response from his listener than the female speaker. Secondly, in these same creative Hindi works the male speaker raises conversational topic

with a statement 64% of the time and the female speaker 52%; the
male raises conversational topic with a statement 36% of the time
and the female 48%. The male speaker is 80% successful in
initiating with a statement or a question, while the female speaker
is 53% successful with a statement and 60% with a question. In
other words, the following pattern emerges: although both sexes use
the option of presenting discourse topic with a statement or a
question the male Hindi speaker predominantly initiates with a
statement, and the female Hindi speaker initiates with a question
slightly more frequently than with a statement.

Although both question and statement forms are opportunities to
initiate discourse topic there is a clear difference in speaker
motivation in the varied use of them by each sex. Generally, it is
argued that questions are stronger forms interactively in that they
are requests for information, action, and acknowledgments and demand
an answer, whereas declarative statements are more easily ignored
and less verbally recognized because they provide information and do
not require a response. If question asking is viewed as a strategy
for the goal of maintaining conversation and for sustaining the
topic and not as a procurement or an elicitation of an answer or
reaction, then the generalization that questions are stronger forms
than statements does not necessarily hold. In the Hindi cross-sex
passages to follow, it will be seen that for the female speaker
effective communication lies in the power of tying together, filling
in, and linking utterances and topics to support and create
continuity in conversation. Therefore, for the female Hindi
speaker, questions serve to maintain an uninterrupted, friendly
stream of talk. For the male Hindi speaker, however, questions are
used primarily to attract the attention of his listener for the
purpose of requesting information. Statement forms, on the other
hand, express facts, rules, attitudes, explanations, and
descriptions. The male Hindi speaker tends to initiate discourse
topic with a statement for the reason that this form suffices to
elict the attention of his listener in order for the maintenance of
his conversational topic. The female Hindi speaker, however, uses a
statement to initiate discourse topic as a conversational strategy
of maintaining continued talk, not as an utterance that ensures the
success of her turn.

Passage I below, from Mohan Rakesh's (1958:45-48) play Asharh
ka ek din, illustrates that the use of question forms by the female
speaker is one discoursal system of sustaining a natural flow of
topic and conversation. The use of questions and tags by the female
participant, Mallikā (M), in lines 1, 3, and 5 is not for the
purpose of seeking a verbal response or even a verbal acknowledgment
from her male partner, Kalidasa (K). Rather these forms function as
a strategy of elicitation of attentiveness from and contact with her
listener as well as of continuity and maintenance of the

conversation in general. No replies are required or expected. On
the other hand, in lines 7 and 9, the question forms which Kalidasa
asks, function to gain a response and are viewed as requests for
information. He is soliciting permission from Mallikā to leave the
village. Mallikā interprets Kalidasa's questions as requests or
inquiries and replies appropriately. The female participant
provides the necessary acknowledgments (e.g., hā and nahī) and
complements her responses with the use of statements, which are
expressed in the forms of internal reports about her feelings and
her future plans. In spite of the fact that these utterances
provide new information, they are not for the purpose of gaining a
successful turn but for maintaining continuance of the verbal
interaction with her male partner.

I.
1. M: phir udās ho gaye? dekho, tum mujhe vacan de cuke ho.
      Are you brooding again? Look, you promised me.
2. K: tum phir ek bār soco Mallikā! prashna sammān
      ɔr rājyāshray svīkār karne kā hī nahī hε.
      usse kahī barā prashna mere samne hε.
      Think again Mallikā! It isn't only a question of
      accepting the honor and patronage. I have a bigger
      question than that.
3. M: ɔr vo prashna mε̃ hu....hũ na. yahā bε̃tho. tum mujhe
      jante ho. ho na? tum samajhte ho ki tum is avsar ko
      thukrakar yahā rah jāoge to mujhe sukh hogā?
      mε̃ jāntī hũ ki tumhāre cale jāne
      par mere antar ko ek rikttā chā legī, ɔr bāhar
      bhī sambhavatah bahut sūnā pratīt hogā. phir bhī
      mε̃ apne sāth chal nahī kar rahī. mε̃ hrday se kahtī hũ
      ki tumhẽ jānā cāhiye.
      And I am the question, aren't I? Sit here. You know me,
      don't you? You think that by turning down this
      opportunity and staying here you will make me happy?
      I know that when you go, I will feel empty
      inside, and outside I'll feel very lonely too.
      Even then, I'm not deceiving myself. From the
      heart I say that you must go.
4. K: cāhtā hũ ki tum is samay apnī ãkhẽ dekh saktī.
      I wish you could see your eyes right now.
5. M: merī ākhẽ isliye gīlī hε̃ ki tum merī bāt nahī samajhte.
      tum yāhā se jākar bhī mujhse dūr ho sakte ho?...yahā
      grām-prāntar mε̃ rahkar tumharī pratibhā ko viksit hone
      kā avkāsh kahā milegā? yahā log tumhẽ samajh nahī pāte
      hε̃. ve samānya kī kasɔtī par hī tumhārī
      parīkṣā karnā cāhte hε̃. vishvās karte ho na ki mε̃ tumhẽ
      jāntī hũ? jāntī hũ ki koī bhī rekhā tumhẽ gher le
      to tum ghir jāoge. mε̃ tumhẽ ghernā
      nahī cāhtī. isīliye kahtī hũ ki tum jāo.
      I have tears in my eyes because you don't seem to
      understand what I'm saying. Even though you go away from
      here will you be far from me? If you stayed in the

village, would you ever find the time to develop
your genius? These people here can't understand
you. They can judge your ability only on general
criteria. Don't you believe that I understand you?
I know that if any line encircles you, you will be caught.
I don't want to hold you. Therefore I say,
that you should go.

6. K: tum mujhe pūrī tarah nahī̃ samajh rahī ho malikkā,
prashna tumhāre gherne kā bhī nahī̃ hɛ....
You don't understand me completely Mallika. It's not a
question of you holding me.....

7. K: mujhe jāne ke liye kah rahī ho?
Are you telling me to go?

8. M: hā̃! dekhnā, mɛ tumhāre pīche prasann rahūgī, bahut
ghumūgī ɔr har sandhyā ko jagdambā ke mandir mē suryāst
dekhne jāyā karūgī...
Yes. You'll see, I'll be happy after you leave. I'll
wander and watch the sunset from the temple....
hɛ 'umse
... ...s mea.. i must leave you?

10. M: nahī̃! vidā tumhe nahī̃ dūgī. jā rahe ho, isliye keval
prārthnā karūgī ki tumhārā path prashast ho...jāo.
No I'm not telling you to leave. You are going so I
only pray that your path is clear...go.

I suggest, then, that rather than positing that the male Hindi
speakers are claiming conversational control and are primary holders
of the floor and attributing the differential characteristics of
initiation of discourse topic to the male dominance and power
structure in Indian society, I treat this linguistic disparity in
initiation of topic between the sexes simply as one discoursal
strategy of power motivated and used by two speakers for the mutual
attainment of effective cross-sex communication. Each strategy
which each speaker empowers is in itself an act of strength, and it
is not that one speaker has more control (or is more powerful) than
another only because one participant initiates more discourse topics
or one uses less question forms. Rather than assuming that such
strategies as initiation of topic are a means of procuring power and
control, they are understood in terms of neutral contributions to
the conversation for better communication. The differential use of
this discoursal strategy, then, is explained by suggesting that male
and female Hindi speakers possess different interpretations of
question and statement forms in initiating topic and sustaining
conversation. For the female Hindi speaker, both questions and
statements are verbal strategies used to maintain and support
conversation. For the male Hindi speaker, question forms are
motivated as acts of requests for information, and statements are
acts of elicitation for attention to ensure a successful topic
initiation.

3.0 A second aspect of effective communication in Hindi cross-conversations which varies with gender are the linguistic conventions of topic flow and topic shift. Once the conversational topic has been introduced, it evolves and changes differently for each sex. For the female Hindi speaker, the system of developing discourse topic progresses gradually and flows smoothly; shifting from one discourse topic to another is usually not sudden or unexpected. Acknowledgments which recognize and evaluate the preceding utterance are made and development of the topic is pursued. For a male Hindi speaker, on the other hand, conversational topic tends to be narrowly defined and topic shifts tend to be disconnected.

Passage II below, an excerpt from Upendranath Ashk's (1976:78-79) short story tɔliye, illustrates the varied linguistic use of topic flow and shift by male and female Hindi speakers. The female participant Madhu (M) and the male participant Vasant (V) are discussing the subject of appropriate behavior. A new subject, the participants' "cousins Ushi and Nimmo", is introduced by the male speaker (line 11); the preceding utterance has no reference to this subject matter. The female speaker recognizes and announces this abrupt shift in topic and exclaims apne phir ūshī ɔr nimmo kī bāt cheṛi 'again you bring up Ushi and Nimmo' (line 12). She then resumes her turn, disclosing personal information and relating a specific party event. Madhu prefaces this forthcoming tale with us din pārṭī mẽ 'at a party one day' (line 12). Vasant obviously does not make an effort to notice this marker of extended talk for he abruptly intervenes with a new subject, Ushi (line 13). Although it may appear Madhu has completed her turn, she has not given up the floor but attempts to continue her talk, this time proceeding with Vasant's newly initiated discourse topic of their cousin. Moreover, it is obvious that Vasant does not interpret the progressive development of Madhu's topic "manners and appropriate behavior" but, in fact, appears to ignore it. He focuses only on her final statement jise bɛthne, uthne, bolne kā salīka nahī̃, vo ādmī nahī̃ - pashu hɛ 'one who doesn't know how to act is not human - but an animal' (line 14). Interpreting this utterance as a personal attack, without warning, Vasant abruptly shifts the topic again to pashu! to tum mujhe pashu samajhtī ho? 'Animal! So you think I am an animal?' (line 15).

II.
11. V: ...- mɛ̃ jab hãstā hũ, jī khōl kar hãstā hũ ɔr isīliye
         ūshī ɔr nimmo...
         When I laugh, I laugh openly and that's why Ushi and
         Nimmo...
12. M: apne phir ūshī ɔr nimmo kī bāt cheṛī. mujhe hãsnā burā
         nahī̃ lagtā. par samay-kusamay kā bhī dhyān honā cāhiye.
         us din pārṭī mẽ āte hī ushī ne mere kān par cuṭakī le
         lī ɔr nimmo ne merī ãkhẽ band kar lī̃. kōī samay thā
         us tarah ke hãsī-mazāk kā. mujhe hãsī-mazāk se nafrat

nahĩ, badtmīzī se nafrat hɛ.
Again you bring Ushi and Nimmo up. I don't hate
laughing. But keep in mind the time and the place.
At a party one day, Ushi covered my ears
and Nimmo covered my eyes. It wasn't the time for
such a joke. I don't hate laughing, but I do
hate bad manners.

13. V: ūshī...
Ūshī...

14. M: parle sir kī badtmīz hɛ. madan kī varṣ-gãṭh ke din
vo sab āye the. nimmo itnī cancal hɛ, par vo to
bɛṭh gayī ek taraf; ye nayabzādī ā bɛthī
mere sāmne sɛndal samet, tāge pasāre ɔr vo uske
gande sɛndal - merī sārī ke bilkul nazdīk ā gaye!
ap is badtmīzī ko shɔk se pasand karẽ, mɛ ise hargiz
bardāsht nahī kar saktī. _jise bɛthne, uṭhne, bolne kā_
salīkā nahī, vo ādmī nahī - pashu hɛ.
On the other hand, she has bad manners. They all came
to my birthday party. Nimmo is usually restless but
she sat on one side; but the princess
sat right in front of me with her sandals,
sprawling and those dirty sandals - they came so close
to my sari. You may like this bad behavior, but I can't
approve of it. _One who doesn't know how to sit, stand,_
and talk is not human - he/she is an animal.

15. V: _pashu!_ to tum mujhe pashu samajhtī ho? tum ādmī kī
sahaj bhāvanāõ ko nirmam varjnāõ kī beriyõ mẽ ɛse
bãdh kar raknā cāhtī ho...
Animal! Then you consider me an animal? You want to
keep a person's natural behavior tied up in chains of
rules...

To gain a clearer understanding of the linguistic systems of
topic flow and topic shift, passage III is provided from Ashk
(1976:75-76). The two participants Madhu (M) and Vasant (V) are
discussing the subject of cleanliness and filth. On the female
speaker's (Madhu) comparison of cleanliness with poetry and art
(line 16), the male speaker (Vasant) expresses impatience and
abruptly interrupts her, changing the discourse topic to and
continuing on a more narrowly defined subject, that of 'hatred for
filth' (line 17). Although in this passage Madhu interjects with
side comments (e.g., to phir kūṛe ke dhero par bɛṭhiye 'then go sit
on a garbage pile' (line 20)) and question forms (e.g., mɛ kab
kahtī hũ? 'When did I say that?' (line 26)), for the most part, she
remains silent while Vasant is absorbed in his particular discourse
topic. It is not until Vasant adds his final touch of samjhi!
'understand!' (line 23) that the floor is formally turned over to
Madhu. Here his use of this emphatic question is not a request for
a response, but an understood signal that he is closing his turn and
that his partner should take the floor.

III.

16. M: me̱ kahtī hū̃, āp unke svabhāv se paricit nahī̃, isīliye
āp ko burā lagā. svacchatā ɔr surūci kī bhāvnā bhī
kāvya ɔr kalā hī kī tarah...
I say, you felt bad because you didn't understand his
behavior. Cleanliness and good taste are like poetry
and art...

17. V: kyõ kāvya ɔr kalā ko apnī is ghṛnā me̱ ghasīṭṭī ho.
tumhāre-ɛse vātāvaraṇ me̱ pale hue sab logõ kī surūci
me̱ ghṛnā kī bhāvnā kam kartī
hɛ - sharīr se, gandagī se, zindagī se ghṛnā kī!
Why do you drag poetry and art into your hatred?
Underneath the good taste of all people brought up
like you is a hatred for the body, for filth and for
life.

18. M: (cup rahtī hɛ)
(remains silent)

19. V: ɔr mujhe zindagī se ghṛnā nahī̃. mujhe sharīr se bhī
ghṛnā nahī̃ ɔr me̱ sac kah dū, mujhe gandagī se bhī
ghṛnā nahī̃.
And life isn't hateful to me. I don't hate the body,
and to tell you the truth I don't hate filth either.

20. M: to phir kūṛe ke dherõ par bɛthiye,
Then go sit on a garbage pile.

21. V: mujhe gandagī se nafrat nahī̃, lekin me̱ gandagī pasand
nahī̃ kartā - baṛā sūkṣma-sā antar hɛ. agar
zindagī kā sāmnā karnā hɛ to roz gandagī
se do-cār honā paregā. phir isse nafrat kɛsī?
jĩn garībo ko tum apne barāmde ke farsh par bhī
pāv na rakhne do, me̱ unke pās ghaṇṭõ bɛṭh saktā hū.
I don't hate filth, but I don't like it either -
there's a big difference - if we're going
to face life then we have to face
dirt everyday. How can one hate it? I can sit
for hours with poor people whose feet you won't allow
on your veranda.

22. M: (Keval hāstī hɛ)
She only laughs.

23. V: ɔr me̱ ne ɛse gande ilākõ me̱ zindagī ke lagātār kaī varṣ
bitāye hɛ, jahā̃ tumhāri surūci kī sanak tumhe̱ guzarne
tak na de. samjhī!
And I have spent years in dirty areas where you,
with your good taste wouldn't pass through. Understand!

24. M: par ab to āp garīb nahī̃. ab to āp gande ilākõ me̱ nahī̃
rahte. garībī kī mazbūrī me̱ samajh saktī hū, lekin
gandepan kā svabhāv merī samajh se dūr kī cīz hɛ.
But now you aren't poor. Now you don't live in dirty
areas. I can understand if you're poor, but I don't
understand how filth can be a part of one's nature.

25. V: to me̱ svabhāv se gandā hū?
So I'm naturally dirty?

26. M: me̱ kab kahtī hū?

|When did I say that? |
27. V: ɛse din mujh par āye hɛ̃...
         I have had days....

Moreover, by examining Hindi cross-sex conversations such as
passages I-III further, it is identified that the female's
participation in the discussion tends to center around joint-sharing
of experiences, providing support and confidence, offering
reassurances, and claiming advice and counsel without being hostile,
dogmatic, or authoritative. Whereas the male speaker tends to act
as an expert or lecturer, giving advice, expressing facts and rules,
and explaining reasons and predictions.

4.0 Other linguistic mechanisms examined which illustrate that
female and male speakers effectively use language differently in
Hindi are the many organizational devices used by the speakers to
regulate verbal contact and conversation. To maintain conversation,
bits of talk, vocalizations, and other related linguistic behavior
are evidence of attention, interest, and understanding on the
listener's part. Not being major contributors to the content of the
conversation, these devices add to the progress and flow of the
verbal interaction.

A number of these cross-sex strategies are available to male
and female Hindi speakers. Some widely used discoursal skills of a
female speaker which coordinate and organize verbal interaction and
fill in discoursal space, include the following. (Examples are
squared in passages I-III above and passages IV-VI below.) 1. The
female speaker employs the strategy of formulaic expressions to
maintain a steady flow of conversation. Throughout the Hindi
passages, the following linguistic fillers are interspersed in the
female speech: routine responses such as mɛ̃ kahtī hū̃ 'I say', mɛ̃
pūchtī hū̃ 'I ask', and mɛ̃ jāntī hū̃ 'I know'; fixed expressions such
as ye āp kah sakte hɛ̃ 'You can say this'; and markers of surprise
such as mɛ̃ kab kahtī hū̃? 'When do I say that?' and mɛ̃ kab inkar
kartī hū̃ 'Do I ever deny it?' 2. A statement uttered by the male
speaker is partially repeated or briefly rephrased by the female
speaker. For example, in passage VI below, the male speaker Vasant
states mɛ̃ ne ɛnak utār rakhī hɛ ɔr ɛnak ke binā tum jāntī ho, hamārī
duniyā... 'I don't have my glasses and you know without my glasses,
my world'... (line 49); the female listener Madhu interrupts (line
50), affirming her attentiveness with honorific jī and reaffirming
her linguistic cooperation with the partial repetition of Vasant's
final statement āp kī duniyā! 'your world!'. She then elaborates
with jāne āp kis duniyā mē rahte hɛ̃! 'who knows in what world you
live'! Similarly, in passage I above, the female speaker Mallikā
seeks clarification of a previous statement uttered by her male
partner, Kalidasa. Kalidasa claims there is a big question

confronting him, usse kahī̃ bara prashna mere samne hɛ 'I have a
bigger question than that' (line 2). Mallikā responds, rephrasing
the male speaker's statement and requesting elaboration: ɔr vo
prashna mɛ̃ hū...hū na? 'And I am the question, aren't I?' (line 3).
3. A sentence begun by the male speaker is completed by the female
partner. In passage VI below, the male speaker Vasant begins a
statement in Hindi mɛ̃ ne āpne sabhī patte... 'I had already...',
(line 55), only to be concluded by Madhu, the female listener, who,
exhibiting and proffering that she holds the same cultural
understanding as he, supplies the rest mez par rakh diye the! 'laid
your cards on the table!' (line 56). Not relinguishing the floor,
she accompanies this thought with a second organizational device mɛ̃
kab inkār kartī hū 'When did I deny it' (line 56). Similarly,
earlier in the passage (lines 43-44) Vasant begins a statement bāt
ye hɛki madan ke tɔliye choṭe hɛ̃ ɔr... 'the problem is that your
towels are small and...'; and Madhu completes it hazamat ke t liyo -
jɛse hɛ 'made of terry cloth'. 4. To begin a turn the female
speaker explicitly acknowledges the previous utterance or discourse
topic spoken by her male partner with the use of acceptance and
non-acceptance responses to questions and non-requests. Common
responses include, among others, affirmatives hã 'yes', jī 'yes',
acchā 'good', sac 'true', zurūr 'to be sure', and denials nahī 'no'
and bas 'enough'. The female speaker then links her male partner's
preceding statements with her own by elaborating on his previous
utterance or on a related topic. This strategy serves to affirm the
existence of her male listener and his discourse topic. In passage
I (lines 7-10) above, Mallikā verbally expresses her recognition of
Kalidasa's questions addressed to her. She explicitly provides
responses of emphatics hã 'yes' (line 8) and nahī 'no' (10) and
information directly complementing the preceding inquiries of
Kalidasa. In addition, Madhu emphasizes the subject matter of her
male partner by using such responses as positive remarks (hã 'yes',
acchā), politeness markers (caliye 'go', āp 'you') and assenting
deference elements (jī 'hon.'), to name a few.

IV.
28. "tum ab sukhī ho?" uskā svar bahut dhīmā thā.
29. "ham donõ pahle bhī sukhī the" - usne kahā.
30. "Hã...lekin ab tum sukhī ho?"
31. "tum jantī ho...ye ham donõ ke liye thīk thā...mɛ̃ ne tumse
    pahle bhī kah thā."
    "Are you happy now?" her voice was soft.
    "We were both happy even before," he said.
    "Yes...but are you happy now?"
    "You know...this was right for both of us...I told you
    that before."
    (Verma, Nirmal: antar)

V.
32. V: kaho bhaī, kyā hāl-cāl hɛ̃? ye sūrat kɛsī ronī banā
       rakhī hɛ. jī kuch kharāb hɛkyā?
       Tell me brother, how are you? Why the long face?

Do you feel ok?

33. M: sukhā jāṛā paṛ rahā hɛ̃. zukām hɛ mujhe tīn- cār
din se.
It's the dryness of winter. I've had a cold for 3-4
days.

34. V: mɛ̃ ne tumse kitnī bār kahā hɛ ki apnī sehat kā dhyān
rakhā karo. sehat-sehat-sehat!... are! ye kāyāpālaṭ
kɛsī! ye palãg drãig-rūm mẽ kɛse ā gayā. ɔr tre ɔr
pyāle....
How many times have I told you to take care of your
health? Health-health-health!... Oh! These changes?
How did the bed get in the drawing room?
And a tray and cups....

35. M: mɛ̃ ne palãg idhar hī bichā diyā hɛ ki āp ɔr āp ke mitrõ
ko zarā bhī kaṣṭ na ho. maze se lihāf le kar bɛṭhiye.
telīfon āpke sirhāne rahegā.
I had the bed moved in here so that you and your friends
would not have any problems. So that anyone could sit
comfortably under the quilt. The phone will
be at the head of the bed.

36. V: vāh! mɛ̃ kahtā hũ. tum to ..tum to... behad acchī ho!
Oh! I say! You, you are wonderful!

37. M: mɛ̃ khud apnī saheliyõ ke sath isī lihāf mẽ bɛṭhī rahī
hũ.
I've been sitting under the quilt with my friends.

38. V: sac!
true?

39. M: acchā, āp jākar hāt-mũh dho lījiye. mɛ̃ cāy tɛyār kartī
hũ.
Ok, go wash your hands and face. I'll get tea.

40. V: mɛ̃ kahtā hũ ki tum kitnī...tum kitnī...tum kitnī acchī
ho!
I say, you're so...you're so...you're so good!

41. M: accha, accha, caliye. pahale hāt-mũh dho kar kapṛe
badliye!
Ok, ok, go. First wash up then change yur clothes.
(Ashk 1976:91-93)

VI.

42. M: mɛ̃ kahtī hũ āp...
I say you...

43. V: Oh! ye kambaxt tɔliye! mujhe dhyān hī nahĩ rahtā.
bāt ye hɛ (hãstā hɛ) ki madan ke tɔliye choṭe hɛ̃ ɔr...
Oh! Those stupid towels! I didn't remember (laughs)
the problem is your towels are small and...

44. M: hazāmat ke tɔliyõ - jɛse hɛ. jī! zara ākh khol kar
dekhiye. hazāmat ke tɔliye kitne rãgīn hɛ̃,
bīsiyõ to dhāriyã paṛī huī hɛ
unmẽ ɔr madan ke kitne sāde ɔr...
...made of terry cloth. Yes! Please look - how
colorful your shaving towels are, there are many stripes
on them while mine are plain and...

45. V: lekin royedār to...
But they are terry cloth...
46. M: donõ hɛ! |jĪ!| ākhe bānd karke ādmĪ donõ kā fark batā
saktā hɛ! |mɛkahtĪ hũ|..
Both are! |Yes!| Even with eyes closed one can tell
the difference. |I say|..
47. V: asal mẽ merā dhyān dūsrĪ ɔr thā. |lāo| mujhe hazāmat
kā tɔliyā de do. kahā hɛ, mujhe dikhāyĪ hĪ nahĪ diyā.
My mind was somewhere else. Ok, |give me| my towel.
I couldn't find it.
48. M: ye to tāgā hɛ sāmne, phir bhĪ...
It's hanging right in front of you, if only...
49. V: mɛ ne ɛnak utār rakhĪ hɛ ɔr ɛnak ke binā tum jāntĪ ho,
|hamārĪ duniyā|..
I don't have my glasses and you know without my glasses,
|my world|..
50. M: |jĪ,|āp kĪ duniyā! jāne āp kis duniyā mẽ rahte hɛ̃!
ab to ɛnak nahĪ, ɛnak ho to kɔn-sā āpko kuch
dikhāyĪ detā hɛ!
|Yes| your world! Who knows in what world you live!
Now you don't have your glasses on, but even when you
do, you don't see anything anyway!
51. V: ye phir tumne mũh phulā liyā, nārāz ho gayĪ ho?
You're pouting again, are you mad at me?
52. M: |nahĪ|mɛ nārāz nahĪ.
|No,| I'm not mad.
53. V: tumhārā khyāl hɛ ki mɛ itnā mūrkh hũ, jo ye bhĪ nahĪ
pahcān saktā?
Do you think that I am that stupid that I can't
recognize that?
54. M: |mɛ kab kahtĪ hũ?|
|When did I say that?|
55. V: |mɛ ne tumse kitnĪ bār kahā hɛ| ki apne bhāvõ ko chipā
lenā tumhāre bas kĪ bāt nahĪ. tumhārĪ nafrat,
tumhārā krodh, tumhārĪ sārĪ bhāvnāẽ, tumhāre
cehare par jhalak ātĪ hɛ. tumhẽ merĪ
ādatẽ burĪ lagtĪ hɛ par mɛ ne tumhẽ adhere mẽ nahĪ
rakhā. apne bāre me, apnĪ ādato ke bāre me, sab kuch
batā diyā thā. mɛ ne apne sabhĪ patte...
|How many times have I told you|that you can't hide your
feelings, even if you try. Your hatred, your anger,
and in fact all your feelings show in your face.
You don't like my habits, but I never kept you
in the dark. I told you about myself, my habits,
and in fact, about everything. I had already...
56. M: mez par rakh diye the! |mɛ kab inkār kartĪ hũ!.|
laid your cards on the table! |Did I every deny it?|
(Ashk 1976:70-71)

This is not to say that the male Hindi speakers do not hold up

their ends of conversation in such a manner, but that the discoursal
strategies which they empower to coordinate turns and organize the
flow of speech are different and less frequent. (Examples are
squared and refer to passages I-VI above). 1. Where the female
speaker uses first person conventions such as mɛ̃ kahtī hū 'I say'
and mɛ̃ pūchtī hū 'I ask', the male speaker addresses to gain and
hold his listener's attention with the direct measure of second
person expressions such as tum 'you', tum jāntī ho 'you know', and
samjhī 'you understand'. 2. Similarly, the male speaker's use of
second and third person pronouns tum and ham, 'you' and 'we',
respectively, is a device to acknowledge and include in the on-going
discussion the existence of the female listener. In passage VI, the
male speaker Vasant utters tum jāntī ho, hamārī duniyā (line 43).
This is literally translated as 'you know, our world' but is
interpreted to mean "my world". 3. The male discussant uses
speaker selection elements to explicitly label and to attract,
catch, and hold the attention of his female listener. Such
linguistic attention getters include, among other constructions:
kaho bhāī 'tell me brother' and tum jāntī ho 'you know'; imperative
markers: lāo 'bring' and soco 'think'; address terms: the listener's
personal given name (e.g., Mallikā); address and reference forms:
bhāī 'brother', maḍam, and tum 'you'; and evocative markers of
surprise: oh, are 'hey', uh 'uh', and vah. Although the female
speaker similarly uses the above linguistic markers, i.e.,
imperative forms such as dekho 'see' and suno 'listen', the male
forms are used as attention getting devices to solicit and secure
the attention of his listener, while the female forms function
similar to boundary markers, fillers, or accompaniments which
regulate and maintain conversation. 4. Where, on the one hand, the
female speaker tends to begin sentences with verbal acknowledgments
the male speaker tends to ignore the preceding comment and pursue
his own topic to effectively hold the floor. As shown in passage
III above, the male speaker (Vasant) does not acknowledge the female
speaker's (Madhu) side comments but continues on as if no
interruption or remark was made. Even vocalizations by his female
partner such as laughter, snickers, and the use of fillers such as
mɛ̃ kab kahtī hū 'When did I say that?' do not deter his continuation
and flow of discourse. To provide further evidence, after each of
Madhu's comments, as if ignoring her verbal presence, Vasant
initiates turns with the conjunction aur 'and', as if making a claim
his turn is still in progress. It is found that the male speaker
begins his turn in this manner five times greater than the female
speaker, all incidences of which are after responses such as these
conversational maintaining devices. 5. The male speaker tends to
use interrogative forms which appear as imperatives, articulating an
immediate concern by the speaker and requiring prompt attention by
his listener. The use of these forms draws attention to the speaker
and exhibits the convention of expert knowledge. Such samples from
the male speech in Hindi, among others, include mɛ̃ ne tumse kah thā
'Didn't I tell you...' (IV,31) and mɛ̃ ne tumse kitnī bār kah hɛ 'How
many times did I tell you...' (VI,55).

For the female Hindi speaker, such organizational devices are signals of continued attention that she is listening to and following closely what is being said by her male partner. Not only do these markers provide the means for her to actively participate in the conversation and to keep the general coordination of speech going, but they also afford a sense of courtesy that her male partner should resume and produce a fuller talk. She is claiming attention as well as calling for elaboration and further development of the discussion. By no means, however, are these mechanisms attempts to take over the turn. For the male speaker, organizational devices are in the form of listener inclusive elements, speaker selection items, expert knowledge expressions, and attention getting markers. They function as a means to ensure that his female partner is listening, following, and attending to his remarks. For both male and female Hindi speakers, then, organizational devices are simply reciprocal discoursal measures. They are symbols of strength which act as a means to ensure an effective cross-sex conversation.

5.0 Conclusion. Since male and female speakers of Hindi have different experiences and social roles and needs in India, it is only expected that the sexes develop different strategies and skills of speech to operate in the society. In particular, I have suggested that when the female and male Hindi speakers interact in cross-sex conversations they use verbal strategies differently. Maltz and Borker (1982) argue that because male and female speakers come from different sociolinguistic subcultures, these language users hold different models for friendly cross-sex conversation. This view possibly explains why female Hindi speakers are the maintainers and sustainers of conversation, whereas for the male Hindi speakers, speech functions more as a means of relating events, conveying messages, and gaining information and attention.

The examination of cross-sex interactions in Hindi reveals that a differential use of discoursal strategies is held by male and female Hindi speakers. First, the speakers have different rates of successful initiation of discourse topic, both with a question and with a statement. For the female speakers, questions and statements function as conversational maintenance devices; for the male speakers, questions are interpreted as requests for information, and statements suffice as forms to initiate successful conversational topic. Second, the female speakers develop and shift conversational topic slowly and gradually; the male speakers narrowly define topic and shift abruptly. And, third, to regulate and coordinate cross-sex verbal interaction, a number of linguistic devices are employed by the female and male participants. As an expression of attentiveness and understanding, sentences begun by the male speakers are completed, partially repeated, restated, clarified, and verbally emphasized and acknowledged by the female partners. As a

direct means to gain attention and a response, the male speakers
ignore their partners' comments and efforts for a smooth stream of
discourse, express expert knowledge, indicate the existence of their
female listeners, and receive verbal deference, acknowledgements,
and attention.

By no means do I propose that all cross-sex conversations are
ideal speech situations. We see the frustration and exasperation
speakers such as Madhu experience when Vasant makes accusations
about her beliefs, or when questions are repeated a number of times
by Mallikā to gain a response from her male partner. That each
gender uses and interprets discoursal strategies in Hindi in varied
ways, suggests that the power strategies of each sex do come into
conflict and can cause miscommunication (Tannen 1982). What is
important, however, is that these discoursal strategies are symbols
of power that do not necessarily require the domination of one
language user over another. The fact that a particular linguistic
skill is used as a resource of interaction and plays a different
role for each sex does not mean that the speaker who makes use of it
more frequently is socially powerful or powerless or
conversationally secure or insecure, but that this verbal strategy
is an expression of strength in itself and is motivated and
interpreted differently by each sex for the mutual goal of
effectively communicating in cross-sex discourse.

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TABLE OF CONTENTS

PREFACE

Theodore M. Lightner was born on September 5, 1934 and died suddenly and unexpectedly in March 1984. He took the B.S. degree at Duke University in 1958 and the Ph.D.in Linguistics at MIT in 1965. He held teaching positions at the University of Illinois (1965-1969), the University of Texas (1969-1973), and several European universities including Aix-en-Provence and Trondheim. He was the author of over forty scholarly publications, including two books. Lightner had wide-ranging interests in linguistics including phonology, morphology, syntax, semantics, mathematical linguistics, Slavic, and Indo-European. His most significant contributions lay in the areas of phonology and morphology.

Throughout his career Lightner was concerned with one basic problem: how to characterize the relation between grammatical units (morphemes) with the same or similar meaning and differing phonetic realizations. His answer was that if there was reason to believe that the relation was systematic, then it should be stated in terms of derivation from a unique underlying form. He saw no reason to believe that there are any inherent constraints on the degree to which the different phonetic alternants may depart from the underlying representation. This position, which he consistently maintained throughout his career as a linguist, had a very significant impact on the development of generative phonology. In their early work, Chomsky and Halle showed that concern for economy and generalization required analyses that violated structuralist preconceptions on proper phonological representations (e.g. Chomsky's derivation of (dialectal) English can't [kæt] from /kant/ or Halle's celebrated argument against the phoneme on the basis of Russian voicing assimilation). While these analyses violated taxonomic phonemic canons, they were well within the spirit of Sapir or the descriptive Bloomfield. Lightner forced generative phonologists to see that the same concern for economy and generalization also motivates a level at which "deeper" alternations such as the vowel shift in English sane-sanity derive from a unique underlying representation--an alternation that even Sapir would have treated by the listing of allomorphs. The most important effect of this move was to considerably expand the data base upon which phonological analysis in terms of underlying representations and ordered rules could be based, thereby making possible most of the important innovations of early generative phonology (e.g. the notational conventions, the cycle, rule ordering, etc.). It is likely that the field would have evolved to this point sooner or later anyway, but it is fortunate that it did so so early. Lightner must be given a good deal of the credit for this.

Lightner's early work was not on English but Russian. Here he showed how many deep alternations traditionally treated by the listing of morpheme alternants could be brought under the rubric of unique underlying representations. His analyses exhibited considerable insight and imagination, as in the famous description of the yers. Lightner's work on Russian culminated in his first book Problems in the Theory of Phonology (1972).

This treatise has been the single most important contribuition to Slavic linguistics by a generative phonologist; all subsequent generative phonological work on Slavic begins by agreeing or disagreeing with the analyses presented in this book.

Ted Lightner had a combative personality, both personally and professionally. His style was to take a strong, often extreme, position and dare you to prove him wrong. One of his favorite locutions was "I bet you ten dollars that...". Encounters with him thus often turned into intellectual arm-wrestling contests. (I am told that he was a varsity wrestler at Duke.) Of course, this kind of stance is often the appropriate one to take when one is trying to develop a radically different approach. It helps to clarify the issues and to attract supporters, especially among the young. During the late '60's when he was at the University of Illinois Lightner was one of the most active and heavily recruited generative linguists and attracted a good many students to the study of linguistics, especially phonology. However, during the '70's the field of phonology and generative grammar as a whole changed to take up the question of constraints on rules and representations. This was a line of research to which Lightner did not contribute, feeling that not enough descriptive work had been done to be able to address the question of constraints satisfactorily. Rather, he continued to develop, essentially in isolation, his concern with characterizing all phonological relationships in terms of unique underlying representations. This line of thought naturally led him to Indo-European and culminated in his final book Introduction to English Derivational Morphology (1983). This strange book is probably best known for proposing that the roots in such English words as father and paternal derive synchronically from the same underlying representation. Among other things this move has the bizarre consequences that the underlying phonemic inventory of English contains laryngeals, and that Grimm's Law is a rule of contemporary English phonology. Lightner continued to challenge what he saw as the phonological establishment to prove him wrong in this and to propose explicit criteria to separate synchrony from diachrony. The majority of phonologists would undoubtedly respond by saying that this line of research is not as likely as others to reveal significant insights into the phonological faculty and hence is not a particularly worthwhile question to be asking, at least at this point in the development of the field. Lightner ended his twenty year career as a linguist in a relatively marginal and isolated position. Nevertheless he was a central figure in the beginning of Generative Grammar and it is the Ted Lightner of these more happy days whom the majority of contributors to this volume knew and wish to pay tribute.

                          Michael Kenstowicz

Editor's note: Given the special nature of this volume, the papers did not undergo the refereeing process that contributions to SLS normally receive. The papers in this issue represent each individual author's way of remembering Theodore M. Lightner.

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MARINA TSVETAEVA
<u>ROLANDOV ROG</u>
March, 1921

ROLAND'S HORN

As the gentle jester of his monsterhood,
I tell the saga of my orphanhood...

Behind a prince, his clan; behind an angel, hosts;
Behind each man, a thousand others at their posts,

A living wall to fall against if faltering, and know
That there are thousands more to carry on the work.

A soldier's proud of his regiment, a devil of his swarm;
Behind the thief's a gang, but back of the jester—his hump.

So, weary at last of cleaving to the ken of pointing
Fingers and the summons to do battle, to the continuo

Of the idiot's hiss and the philistine's hee haw,
—Alone among all, for all, counter to all—

I stand and send, at take-off turned to stone,
This rousing call into the heavens' void.

And by the fire in my breast this pledge is sworn:
Someday a Charlemagne will hear you, Horn!

<div style="text-align: right;">

Translation by
Catherine V. Chvany
September, 1985

TO THE MEMORY OF
THEODORE M. LIGHTNER

</div>

ERGATIVE AND ARGATIVE (NEE ERGATIVE TOO)

Catherine V. Chvany
Massachusetts Institute of Technology

The term ergative has developed a second meaning in the recent
literature, one that is antonymous with the traditional one.
I propose keeping the original term in its root meaning, and
coining for the second meaning the term argative (cf. Argon,
the inactive gas), prefixing the negative a- to the root these
terms share with work, energy, erg.

As Ted Lightner liked to point out, the words energy and work share
the same root, which is also found in erg, the physicists' unit of work
(from Greek ergon 'work'), and in ergative (from Greek ergates 'doer,
actant') a term whose root meaning suggests agency. In so-called ergative
languages, the ergative case inflection marks the (most often agentive)
subject of a transitive verb, while the direct object appears in the
absolutive (or nominative) case, as does the subject of an intransitive
verb. For instance, in the sentence pair, Ivan opened the window/ The win-
dow opened, Ivan would be in the ergative case, while the gloss of window
would appear in both sentences in the same absolutive or nominative case.
Until Keyser and Roeper's 1984 article, some of us Slavists found it
convenient to refer to such window-arguments as "the absolutive set."
In Relational Grammar the roughly corresponding term was "unaccusative."
The terms "absolutive" and "unaccusative" tacitly included in their
reference the role of window in The window washes easily. Since Keyser and
Roeper's evidence for crucial distinctions between window in the first pair
(which they term "ergative pairs"), and window in the latter sentence type
(which they term "middles"), the traditional terms "absolutive" and
"ergative" have become hopelessly ambiguous.

The term ergative has undergone an unusual historical change ever
since Burzio 1981; this change has spread, so that many linguists in the
United States now routinely use ergative to refer to non-agentive "absolu-
tive set" arguments. Pesetsky 1982, for instance, finds interesting
generalizations that apply in Russian to the absolutive set, which he calls
"the ergative set." Keyser and Roeper's discussion of ergative pairs
assigns the term ergative to the inactive rather than the active argument,
with a note pointing out that in other frameworks their "ergatives" are
called "absolutive" or "unaccusative." That is, the new sense of ergative
(let's call it ergative-2) is the antonym of the term in its traditional
sense (or ergative-1).

So far, local communication problems due to the ambiguity have not
been too serious; one adjusts for metadialect variations, resorting to
modifiers, such as "ergative in the sense of Burzio" or, as is now more
likely, "ergative in the sense of Keyser and Roeper." But the rise of
ergative-2 does hamper international and interdisciplinary communication.
Though the results of the research on "ergative-2" and "middle" should
stimulate parallel investigations by linguists all over the world, such

ambiguities pose obstacles (compounded for those colleagues abroad who read English with difficulty). Citation is awkward if one has to redefine an established term; Americans working on, e.g., Slavic should not have to explain to Slavs that these "ergatives" have a precisely opposite role from the one they normally associate[1] with the ergative case.

A more transparent term would greatly facilitate the sharing of the important findings about "ergative-2s" and "middles." For the inactive member of Keyser and Roeper's "ergative pairs" I propose ARGATIVE, with the negative a- attached to the root RG (on the analogy of <u>Argon</u>, the name of the <u>inactive</u> gas.) K&R's "ergative pairs" would then be more perspicuously renamed "ergative-argative pairs." For native speakers of "ergative-2" dialect, the slight phonological change should cause only minimal discomfort. For others it would eliminate an irritant while making the new work on grammatical relations more accessible to linguists in other countries, including those who study or speak "ergative (1)" languages. The term <u>absolutive</u> might remain in its traditional sense of "antonym of <u>ergative</u>," while NPs like the subjects of "middles" might be called something like "argatives with inexpressed generic agent," now that Keyser and Roeper have opened our eyes to this distinction among absolutives.

<div align="right">

<u>Massachusetts Institute of Technology</u>

</div>

NOTE

[1]Slavic dictionaries of linguistic terms associate the term <u>èrgativ</u> with agency. Axmanova says it is a case for marking "the source of the action." Rozental' and Telenkova's entry for <u>èrgativnyj</u> describes ergative sentence of certain (e.g., Caucasian) languages, characterized by "a special case for the active doer (the ergative, or active, case)." The antonymous, complementary case (of our "absolutive set," or "ergative-2") is termed "a direct case (the passive case of the non-doer, having the nominative case form without any case ending).

The older dictionary of Marouzeau defines <u>ergatif</u> and its German, English and Italian cognates as "Cas désignant l'agent dans certaines langues comme le basque .... These brief definitions are of course oversimplified; in spite of the strong association of morphological ergative case marking with the agentive role in the so-called ergative languages, the two are far from fully co-variant.

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    terminov. Moscow: Prosveščenie. [Translations mine, CVC.]

PALATALIZATION IN RUSSIAN

Herbert S. Coats
University of Washington

This paper reviews briefly several analyses that have been proposed for palatalized consonants in Russian: those of the structuralists, for whom palatalization was phonemic; of Theodore Lightner, who proposed an abstract analysis in which consonants become palatalized before front vowels; of other linguists who have retained Lightner's palatalization rule in less abstract phonological systems that typically posit a rich inventory of underlying front vowels, such as /i e ä ö ü/; and finally of Gilbert Rappaport, who retains the palatalization rule in an analysis in which the underlying front vowels are /i e/. This approach is considered here the most promising because it allows for an analysis that is concrete and psychologically plausible, one constrained by the transparency condition. Several problems that arise in this framework are discussed, including the exceptional behavior of /š ž c/, the relationship between /i/ and /ɨ/, and the behavior of velars. This analysis provides a novel but straightforward account of the shift of /velar + ɨ/ to [palatal + i].

In the traditional structuralist view of Russian phonology, a view that dates back to Roman Jakobson and many of his students, palatalization was considered phonemic for most consonants, so that forms like l̲j̲u̲b̲i̲t̲'̲ 'to love' and p̲j̲a̲t̲'̲ 'five' were analyzed as follows:

/l'ub'it'/ → [l'üb'it']
/p'at'/   → [p'ät']

The only rule that applies in these examples is one that fronts vowels between palatalized consonants. In classical phonemic theory there was a simple and direct relationship between phonemic and phonetic representations, such that each can be deduced from the other, the so-called biuniqueness requirement. Alternations of palatalized (soft) and nonpalatalized (hard) consonants were described in the morphophonemic component. This was the generally accepted view of palatalization until Ted Lightner appeared on the scene.

Lightner, impressed by Halle's famous argument against biuniqueness (Halle, 1959, pp. 19-23), rejected the phonemic level and worked out a detailed phonology of Russian that attempted to account for the whole range of data described previously in both the morphophonemics and phonemics. Lightner's synchronic phonology mirrored the historical development of Russian: His underlying representations looked like Proto-Slavic forms, and his phonological rules looked like historical sound changes that took place in the evolution of Russian. Lightner's analysis of the two forms cited earlier, for example, would be roughly as follows (see PTP, pp. 57, 201-2):

/leub-i-tɨ/ → /l'eub'-i-t'ɨ/ → /l'ub'-i-t'ɨ/ → /l'ub'-i-t'/ → [l'üb'-i-t']
/pint-ɨ/   → /p'int'-ɨ/ → /p'ant'-ɨ/ → /p'at'-ɨ/ → /p'at'/ → [p'ät']

The first rule above is one that palatalizes consonants before front vowels. This is a familiar and natural phonological process, one that is described in the SPE feature system as a kind of assimilation: Consonants are marked [+high, -back] when they occur before vowels marked [-back]. In Lightner's analysis later rules sometimes alter these front vowels--they shift to back vowels or are dropped altogether, so that the vowels that caused the palatalization are not present in the phonetic representation, as in the examples above. Neither the opacity of this analysis nor its abstractness ever bothered Ted very much. He was attracted by the rigor, explicitness, and, in a sense, the simplicity of this approach to phonology, and throughout his career he pushed it, with great consistency and perseverance, to the limit.

It might be expected that a phonology that recapitulates historical sound change might run into complications in describing phenomena that arose by analogy rather than regular sound change, and indeed Lightner's analysis of palatalization provides instances of this. For example, in Old Russian there were i-stem nouns like kost' 'bone', which had the prepositional plural form kostixŭ, in which the t was palatalized due to the following front vowel. Then the a-stem ending axŭ spread by analogy to other nouns, yielding kostjaxŭ, with the original soft t retained before a new back vowel. In his analysis of this form Lightner posited underlying kost-axŭ, and now he had the problem of accounting for the palatalization of the stem-final t. In order to describe this and other soft-stem nouns, Lightner marked their stems -HARD, and he expanded the palatalization rule to apply to the final consonant of a stem so marked (PTP, pp. 277-90). Note that this analysis accounts for the hard t in the diminutive kostočka, because the t in kost is not in stem-final position in this form.

Lightner's basic line of analysis, that consonants are palatalized before front vowels, has considerable appeal not only because it is a natural phonological process, but also because it accounts for innumerable alternations of hard and soft consonants in Russian, as in stol 'table' and the following forms that contain this root: stola, stolu, stolĭ, stolovíj, all with hard l, as opposed to stole, stolik, which contain soft l before a front vowel. In addition, there is a clear restriction of the distribution of hard consonants in Russian: With a few exceptions that will be discussed below, hard consonants do not occur before front vowels. A palatalization rule could account for this fact. It is therefore not surprising that a number of linguists who are unwilling to accept Lightner's degree of abstraction are attracted by the idea of predicting palatalization before front vowels. Among such linguists are Lunt (1975), DeArmond (1975), and Bratkowsky (1980). Although each has his own approach, in general they argue that the inventory of phonemes in Russian contains the front vowels /i e ä ö ü/ and that these vowels cause palatalization of a preceding consonant. Their analysis of ljubit' and pjat' is roughly the following:

/lübitĭ/ → [l'üb'it']
/pätĭ/ → [p'ät']

It is clear that the vowels /ü i ä/ will palatalize the preceding consonants. It is less clear how the t becomes palatalized in these forms, and each of the linguists cited above solves this problem in his own way. In the examples above I have followed Lunt's proposal, taken from Lightner, that the underlying form contains a lax ĭ which palatalizes the preceding consonant and then

drops out. In order to account for forms like kostjax, Lunt marks their stems +FRONT, which, like Lightner's -HARD, has the effect of producing palatalized t in this form, although in a way different from Lightner's.

Although I sympathize with the aims of this approach and in particular with the desire to retain the palatalization rule in a framework less abstract than Lightner's, I find this approach still a bit too abstract for my taste. Like the structuralists, I believe that there should be a simple and direct relationship between phonemic and phonetic representations, a relationship defined not in terms of biuniqueness, but rather transparency. By transparency I refer to the requirement that the phonological entities--the segments and boundaries--which condition a phonological process be present on the surface, in phonetic representations. I believe that it is the province of phonology to describe only those phenomena--phonological alternations, restrictions on the distribution of sounds, etc.--which can be characterized in terms of conditioning factors that are readily accessible, factors present at the phonetic level. The transparency constraint appeals to me because there is at least a possibility that phonemic representations subject to this constraint may have psychological reality. It seems less likely to me that highly abstract underlying representations have psychological reality, but of course, as Lightner would point out, this is idle speculation, given our present knowledge of such matters.

However, many of the phonological processes described by Lightner (in PTP, for example) happen to conform to the transparency condition. Among them are regressive voicing assimilation of obstruents, the devoicing of obstruents in word-final position, the reduction of unstressed vowels, the fronting of vowels between palatalized consonants, etc. His description of the palatalization of consonants, of course, does not conform to this constraint, nor do those proposed by Lunt, DeArmond, and Bratkowsky, because the phonological factors that condition the palatalization of t in pjat' are not present at the phonetic level. I believe the same is true for kostjax, which I would expect to contain the ending /ax/, as in stolax, although Lunt posits the ending /äx/ here, a variant of /ax/ that occurs with stems marked +FRONT. This complication could be eliminated and the transparency condition observed by positing underlying soft consonants. Our two forms now have the phonemic representations /kost'-ax/ and /pät'/ or /p'at'/. But if Russian contains underlying soft consonants, then there is no reason to posit /pät'/ rather than /p'at'/, particularly at the expense of including in our inventory of phonemes the vowels /ä ü ö/, phonemes which are no longer necessary and which, I suspect, have little psychological validity.

Rappaport (1981) has suggested that Russian contains the vowel phonemes /i e o u ɨ a/ and that the two front vowels here, /i/ and /e/, cause palatalization of preceding consonants. Palatalization in other positions is not phonemic. This analysis is consistent with the transparency condition; it retains the rule that palatalizes consonants before front vowels, which is a natural phonological process; it accounts for many alternations of hard and soft consonants, as in the examples containing the root /stol/ cited earlier; and it accounts for the restriction on the distribution of hard consonants that was mentioned earlier. In this analysis the palatalization of consonants is comparable to voicing in obstruents. Most obstruent phonemes come in pairs such as /p b/, /t d/, etc., but in certain positions, such as at the

end of the word, this contrast is lost because the rule of final devoicing shifts voiced obstruents to voiceless ones in this position. Similarly, most consonants come in pairs such as /t t'/, /s s'/, etc., but before a front vowel this contrast is lost because the palatalization rule applies in this position. In the remainder of this paper I shall explore several problems that arise if one takes this analysis seriously.

The first problem concerns the few consonants which are not paired with respect to palatalization. These are /č' j/, which are always soft, and /ž š c/, which are always hard. We account for these facts by saying that these phonemes are appropriately marked for the features [high] and [back], possibly by redundancy rules. The problem is that /ž š c/ do not become palatalized when they occur before front vowels, as in no_že_ [naže] 'knife (prepositional singular)', phonemically /nož-e/. Now /ž š̄ c/ differ from other hard consonants in that they are strongly velarized, while the others are only slightly velarized--see Avanesov (1972, pp. 34-44). That is, /ž š c/ are marked [+high, +back], while the others are [-high, +back], in contrast to plain consonants, which are [-high, -back]--see SPE (pp. 305-8), where a different interpretation is given for consonants marked [-high, +back]. I propose that the palatalization rule be restricted to apply only to consonants that are specified [-high]. This now excludes /ž š c/ from undergoing the rule, and it does so in a way that seems fairly plausible. It is not unreasonable that strongly velarized consonants might resist palatalization.

This treatment of /ž š c/, however, leads to a problem with the velars /k g x/, which do undergo the palatalization rule, as in <u>ruke</u> [ruk'e] 'hand (prepositional singular)' and <u>deduškin</u> [d'edušk'in] 'grandfather's', which are derived from /ruk-e/ and /dedušk-in/. The velars are of course specified [+high, +back], and so the palatalization rule as presently formulated will not apply to them. Note that the shift of /k g x/ to /k' g' x'/ does not really involve palatalization, but is rather the change of velars to palatals. That is, the primary point of articulation changes when this shift occurs, while palatalization per se involves a change in secondary articulation only. These considerations lead me to suggest that the shift of /k g x/ to /k' g' x'/ should be described by means of a rule quite independent of the palatalization rule, a rule that applies only to velars. The proposed rule is given below:

$$\begin{bmatrix} -son \\ -cor \\ -ant \end{bmatrix} \rightarrow [-back] / \underline{\hspace{1cm}} \begin{bmatrix} +voc \\ -back \end{bmatrix}$$

The distribution of [k' g' x'] gives some additional motivation for analyzing them differently from the palatalized consonants. With very few exceptions, most of them foreign borrowings, these sounds occur only before the phonemes /i e/, and of course in these positions they are derived from underlying /k g x/. Consequently the phonemes /k' g' x'/ are restricted to the few exceptional forms referred to above. As we have seen in examples like <u>ljubit'</u> and <u>pjat'</u>, the palatalized consonants are not restricted in this way.

I proposed above that the palatalization rule be formulated so as not to apply to /ž š c/. The rule must also be formulated so as not to apply across the prefix-preposition boundary #. The phonemic representations

/s#ekranom/ 'with the screen', /s#ivanom/ 'with Ivan', and /s#igrat'/ 'to
play', for example, yield [s#ekranom], [s#ivanom] and [s#igrat'], with no
palatalization of the initial s̲ in these forms. (The backing of /i/ to [ɨ]
in these examples will be discussed below.) The proposed palatalization
rule for Russian is given below. I adopt here the convention, which as I
understand it is proposed in SPE (p. 67), that rules automatically apply
across a formative boundary, but they apply across larger boundaries such
as # only if these boundaries are specified in the rule.

$$\begin{bmatrix} +\text{cons} \\ -\text{high} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} / \underline{\hspace{2em}} \begin{bmatrix} +\text{voc} \\ -\text{back} \end{bmatrix}$$

This rule will not apply across #, and neither will the rule for velars given
on the preceding page, which is the correct analysis in view of forms like
/k#ekranu/ 'to the screen' and /k#ivanu/ 'to Ivan', which yield phonetic
[k#ekranu] and [k#ivanu].

I would now like to discuss briefly the relationship between /i/ and the
high, back, unrounded vowel /ɨ/. The phonemic status of the latter has been
a controversial question in Russian phonology for a long time. Most recent
studies, such as those of Bratkowsky (1980) and Rappaport (1981), provide
new evidence that /ɨ/ is indeed an independent phoneme, and in this paper I
have assumed, and shall continue to assume, that it is. There are, however,
instances in which /ɨ/ is realized phonetically as [i] and vice versa. We
have seen, for example, that the underlying nominative plural ending in
nouns is /ɨ/, as in /stol-ɨ/, which yields [stalɨ]. After a palatalized
consonant, however, this /ɨ/ is realized as [i]--an example is [los'i] 'elks',
derived from underlying /los'-ɨ/. Thus we need a rule that shifts /ɨ/ to [i]
after a palatalized consonant. If we compare two dimunitive forms like
[stol'ik] and [nožik] 'knife', derived from /stol-ik/ and /nož-ik/, we see
that we also need a rule that shifts /i/ to [ɨ] after a hard consonant. These
two rules can be collapsed by using the alpha convention:

$$\begin{bmatrix} +\text{voc} \\ +\text{high} \\ -\text{round} \end{bmatrix} \rightarrow [\alpha\text{back}] / \begin{bmatrix} +\text{cons} \\ \alpha\text{back} \end{bmatrix} (\#) \underline{\hspace{2em}}$$

The optional # in this rule allows it to apply in forms like /s#ivanom/ which
were discussed above.

There remains one problem to be discussed. It turns out that /ɨ/ shifts
to [i] after a velar, as in nominative plural [dux'i] 'spirits', derived from
/dux-ɨ/. Within the framework developed above there are several ways to handle
such forms. We could posit a rule that shifts velars to palatals before /ɨ/,
and then the rule given above would shift the /ɨ/ to [i]; that is, the deri-
vation would proceed as follows: /dux-ɨ/ → /dux'-ɨ/ → [dux'i]. Or one could
introduce a rule that fronts /ɨ/ after a velar, and then the rule given earlier
that shifts velars to palatals would apply--i.e., /dux-ɨ/ → /dux-i/ → [dux'i].
Finally, we could say that two rules already formulated above, the one that
shifts velars to palatals and the one that fronts /ɨ/ to [i], apply simulta-
neously, each producing the segment that functions in the environment of the
other. Notice that the phonetic representation [dux'i] is transparent with
respect to both of these rules. The rule that shifts /x/ to [x'] requires a

follcwing front vowel, which is present in [dux'i], and the rule that fronts
/ɨ/ to [i] requires a preceding consonant marked [-back], which is also
present in [dux'i] I prefer this last analysis because it is the simplest--
it does not require a new rule--and it is consistent with the transparency
condition. It also avoids unnatural intermediate representations like
/dux'-ɨ/ and /dux-i/.

A final comment about rule ordering. With a single exception, none
of the rules formulated in this paper are extrinsically ordered. They can
apply in random order or, as suggested above, they can apply simultaneously.
The exception involves the palatalization rule, which must apply before the
rule that shifts /i/ to [ɨ]; underlying /stol-ik/ must yield [stol'ik], not
[stolɨk]. I consider this an inadequacy of the present analysis. A possible
solution might be to posit underlying plain consonants rather than what I
characterized above as slightly velarized ones. That is, such consonants
will be marked [-high, -back] rather than [-high, +back]. The derivation of
[stol'ik] now works out all right, but we still have to account for forms
like [sⁱigrat'] and for the fact that the hard consonants in Russian are
slightly velarized. I end this paper with a challenge to the reader to
find a solution to this problem.

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CASE AND CONTROL IN HINDI-URDU

Alice Davison

Non-finite clauses of various kinds may lack overt subj-
jects, but the referent of the null subject is supplied
by an antecedent, or controller. Control may by obliga-
tory or optional, allowing an arbitrary interpretation.
For Hindi-Urdu, the control properties of a non-finite clause
are determined by its syntactic relation to the matrix clause.
VP constituents are clauses which are obligatorily controlled,
others are optionally controlled if there is an available
antecedent. Obligatorily controlled null subjects lack case;
they cannot be NPs originating in positions which receive overt
postpositions, such as the dative-accusative which marks exper-
iencers or patients. The different control properties of non-
finite clauses and the restrictions on null subjects suggest
that Hindi-Urdu can be regarded as a configurational language,
in which phrase structure relations are relevant to rules of
grammar, and that non-finite clauses should be represented as
having a syntactic subject position.

Languages like Hindi-Urdu appear to have relatively free word order in
surface syntax, and to lack syntactic rules which reorder NPs, changing
grammatical relations. For these and other reasons Hindi-Urdu might be
considered a nonconfigurational language, in which grammatical relations
are not encoded in structural relations characterizing phrase structure
trees. Instead, on one view, case marking and grammatical relations might
be assigned by verbs to constituents designated in non structural ways as
their arguments, by lexical frames (cf. Farmer (1985) for example). Yet a
closer examination of the specific patterns of case marking and the rules
for the control, or assignment of reference, to null subjects in Hindi-Urdu
reveals features of the syntax which lend themselves to description in
configurational syntactic terms. It will be proposed in this paper that
case-marking and control in a language like Hindi-Urdu, with some freedom
of word order and extensive case-marking, can be considered a
configurational language, and that syntactic encoding of grammatical
relations is a general principle from which the restrictions on case
marking and control follows natural consequences.

The discussion will be centered on NPs with dative-accusative
case-marking. These NPs have a dual nature, with both object and subject
properties. For example, passive object NPs may retain dative-accusative
case in S-Structure; experiencer NPs always have dative marking. Yet both
kinds of dative-marked NPs also have properties of subjects, as in other
languages such as the Quechua languages (Hermon (1981), (1985)) and Nepali
(Wallace (1985)). Dative NPs may undergo Raising, be marked as subjects in
Exceptional Case Marking contexts, and be the antecedent controlling
reflexives and PRO, which require subject antecedents. This paper takes
the position argued for in Davison (1969, 1985), and the analyses by Hermon
and Wallace that NPs with surface non-subject marking are subjects at
another level of derivation. Within the Government and Binding framework
of Chomsky (1981), NPs get case marking in S-Structure by virtue of their

configurationally defined roles as arguments of the verb in their clause,
but acquire subject properties by being moved in the derivation of LF to
subject positions, where they meet the requirements for binding of
antecedents.

This analysis of dative-marked NPs makes possible some interesting
statements about the role of case-marking in this language, and about the
properties of case-marked subjects, including dative subjects. When
control of PRO is obligatory, case-marked subjects are prohibited. These
facts are of some interest in showing the consequences of language
specific features for the general description of phenomena like the
coindexing of PRO and its antecedent. They also point to specific
grammatical properties of null subjects, a matter which is controversial
and has led to the treatment of infinitives as bare VPs (Gazdar et al
(1985)) rather than as clauses with empty subject positions. Finally the
analysis proposed here will suggest that the level of syntactic description
Logical Form has some syntactic functions which parallel the functions of
the derivation of S-Structure in other languages.

An example of control in the conjunctive participle construction is
given in (1) below. $_1$The conjunctive participle is marked by the affix -kar
on a tenseless verb.^{1}

1) bahut baar woo$_i$ [PRO$_i$ saRak bhuul - kar] bhaTak gayaa
    many   times 3psg   road   forget conj.part be-lost go-perf

    ' Many times PRO forgetting the way he got lost' (T.Q. 42)

2) mistrii$_j$ - nee [PRO$_i$ /* baniyaa$_j$ kal   aa - kar]
    carpenter erg   shopkeeper^j yesterday come CP

    sanduuq   banayaa
    box   build-perf.

    'The carpenter having come yesterday made the box'; *'The
    carpenter made the box the shopkeeper having come yesterday'.

The sentences in (1) and (2) containing the conjunctive participle in
a subordinate clause illustrate the control and case-marking properties
which will be the main topic of this paper. It will be assumed that
sentences like (1) and (2) contain a main clause, with all its arguments
potentially realized as lexical items.^{2} These two sentences also contain a
subordinate clause which has the otherwise tenseless verb marked with -kar,
meaning roughly 'perfective' The subject of the conjunctive participle
clause is always null, and always coindexed with the subject of the main
clause.^{3} This contruction is a case of obligatory syntactic control,
contrasting with constructions of other syntactic types which allow the
subject to be lexically realized, or optionally controlled by an
antecedent. In such cases there may be no syntactic antecedent, allowing
for discourse control of a null subject which has essentially an arbitrary
interpretation.

Case in Hindi-Urdu is assigned to NPs by the verb or verbal complex
which governs them. Direct objects are optionally marked with the
dative-accusative post-position -koo, though some verbs require specific

postpositions such as -par 'on` or -see 'with', which are obligatory. Subjects have either no case marking at all, and appear in the `direct` form if they are inflected words, or else get the ergative marker -nee if the verb is transitive, lexically marked for ergativity and if the aspect of the clause is perfective.⁴ Infinitive clauses are never inflected for perfect aspect per se, so infinitives never assign ergative case to their subjects, whether overt or null. Dative subjects are a somewhat special case, but are obligatorily marked by their c-commanding verb with -koo in a way to be described in further detail in the paper. In examples (1) and (2), the case-marking appears only on the main clause subject, and is determined by the main clause verb. In the sentence in (1), the main verb is intransitive, so the subject has null case, while in the main clause in example (2), the subject has ergative marking because the main clause verb is perfective and transitive; the verb of the conjunctive participle clause is intransitive, and would mark its subject with the null or direct case if it were overt. The verb of the conjunctive participle in example (1) is grammatically transitive, taking an object, but does not assign ergative marking to its subject.

The grammatical rules of Hindi-Urdu allow null subjects in subordinate clauses, which may have syntactic antecedents, or must have syntactic antecedents; their control properties are determined by syntactic relations, as we shall see in more detail later in the paper. Besides the conjunctive participle construction, other syntactic constructions which require PRO subjects to be controlled either by subject or object syntactic antecedents include infinitive object clauses which are complements of verbs like caahnaa `want', kahnaa `say' and siikhnaa `learn'. Examples (3) and (4) illustrate PRO as a complement subject controlled by a subject or an object.

3) pro_i [PRO_i kheelnaa] jaantee nahĩĩ -[PRO kheelnaa]
　　　　　　　　play-inf. know-2ppl not　　　　play-inf.

　　siikhoo
　　learn-2p.pl.fam. Porizka (1963:340) `You don't know how to

　　play (chess); learn to play'.

4) us_i- nee surendra_j- koo [PRO_j saath calnee -kee
　　3psg erg　S　　DAT.　　　　with　go-inf. of

　　liyee] kahaa
　　sake　say-perf. Ibid p. 431. `She asked Surendra to walk
　　　　　　　　　　with her'.

In the sentence in (3), PRO is controlled by the syntactic subject of the sentence, which is not lexical, but its properties of being second person familiar, or tum are recoverable from the person and number inflections on the verb. The antecedent of PRO in the sentence in (4) is surendra, whose postpositional marking shows that it is an indirect object of the main verb kahaa.

Syntactic control by a subject or indirect object antecedent is required for PRO in these cases. The syntactic contexts where control of

PRO subjects is obligatory include the infinitive objects of verbs and the tenseless clauses marked by the conjunctive participle affix -kar, both constituents of VP. As the complement clauses are tenseless, the subject could not be assigned ergative marking even if it normally has such a marking in a main clause. Hence there is no reason to assume that the PRO subject in these examples would be assigned any case. It is indistinguishable from the lexical subjects which have the `direct' morphological form rather than the oblique form of inflected nouns etc., and no postposition. The pattern of obligatory syntactic control with no case-marking illustrated above will now be contrasted with another pattern in the following examples. Here, control is pragmatic, PRO is not obligatory, and case is assigned to the NP in subject position.

The syntactic contructions with the latter set of properties includes subject infinitives, participial adverbial clauses and modifier clauses. These are illustrated in (5)-(7) below:

5) [PRO$_{arb}$ pyaar karnaa] zindagii /PRO$_x$ jiinaa hai
       love do-inf. life   live-inf. is

`PRO$_{arb}$ to love is life/ PRO$_x$ to live'.

6) [PRO$_i$ deer soonee - see] mujhee$_i$ sirdard hoo jaataa
      late sleep-inf.from   1psg-DAT headache be go-impf

hai. `I get a headache from going to bed late'.
is

7) kaun sii baat [PRO$_{arb}$ karnee -kaa] hai, aur kaun sii
   what like matter   do-inf.-obl.of is and who like

nahĩĩ? `What should one do and what should one not do?'
not

(Porizka (1963:338))

In the sentences in (5) and (7), the PRO subject in the first, or subject infinitive has no syntactic antecedent, and so refers arbitrarily. Information in the discourse context may be used to fix the reference. The PRO subject in the second infinitive clause in (5) is controlled by the PRO of the first clause; that is, it does not have independent arbitrary reference. The PRO subject inside the adverbial clause in (6) is coreferential with the dative subject of the main clause; as we will see shortly, clauses with infinitival or participial morphology and adverbial function allow optional control.

The clauses which have PRO subjects of the types just illustrated all allow overt lexical subjects which do not have to co-refer with any other part of the sentence. Counterparts to sentences (5) - (7) are given in (8) -(10) below:

8) [sarfraaz kaa kyaa karnaa] ajiib kii baat hai?
   { S   of what do-inf. } strange of matter is

`What is it strange for Sarfraz to do?

9) ⌈ meeree   kyaa   karnee - see ⌉ pitaa -koo gussaa aayaa?
   ⌊ 1psg-of what   do-inf.-obl.from ⌋ father-DAT anger come-perf

   `Father got angry on account of my doing what?'

10) kaun sii baat ⌈meeree   karnee   kii⌉hai, aur   kaun sii
     who like matter 1psg-of do-inf.obl.of is   and   who - like

     tumharee?   `What should I do, and what should you?
     2pplfam-of

In each of the three sentences above, the PRO subject which occurred
in (5) -(7) has been replaced by a lexical NP with genitive case, which is
normal for NPs referring to animate beings. Subject NPs referring to
inanimate objects have 0 case:

11) ⌈ yahãã - see landan -tak bhaaii - kee/ciTThiiØ pahũcnee-
    ⌊ here   from L.   to brother of   letter   reach-inf.

    -mee ⌉ kitnee din   lagtee   hãĩ?
    in   ⌋ how-many days strike-pl is-pl

    `How many days does it take for brother/for a letter to reach
    London from here?' (Porizka (1963: 342))

As the example in (11) shows, the subject of the adverbial clause may have
either genitive or null case, depending on the properties of its referent.
In all these syntactic contexts, PRO and control of PRO are not obligatory,
and there is a case, the genitive, associated with the complement subject
position. There may be null subjects in adverbial clauses which are not
syntactically controlled. This is the case in the example in (12):

12) ⌈ PRO_arb caltee   caltee   ⌉ andheeraa   hoo gayaa
                walk-impf-walk-impf darkness   become go-perf

    `As (he) went along, darkness fell'. (Porizka (1963:359))

Here the subject of the modifying clause is null, and certainly not
identical in reference to the subject of the main clause andheeraa
`darkness'. Of course, there are other sentences in which the PRO subject
of the adverbial could be controlled by the subject of the main clause.
The reference of the subject of the participial modifying clause can be
determined by the discourse context, and is not restricted by syntactic
principles.

It was mentioned earlier that there are some reasons to believe that
dative NPs, both direct and indirect objects, have subject properties of
various kinds. Two kinds of evidence will be given below in the examples
in (13) and (14):

13) too kumar_i-koo kaisaa   lageegaa, ⌈PRO_i unhẽẽ_i
    then K.   DAT.   how   strike-fut. ⌊   3ppl.DAT.

```
deekh - kar? 5   ]
see    Conj. Part.
```

`Then how will it strike Kumar, PRO having seen them?'
    (Mohan Rakesh, Antaraal)

The subject position of the conjunctive participle clause is obligatorily
null. This null subject of the verb deekh-kar must be controlled by a
subject in the matrix clause, in this case kumar-koo, which is marked with
the dative postposition as the experiencer complement of the verb lageegaa.
This verb is subcategorized for an experiencer. It is proposed in Wallace
(1985) and Davison (1985) that experiencer NPs are verb complements in
syntactic structure, but are moved in the derivation of Logical Form to
subject position. The requirements for control of PRO would be relevant to
LF, not to S-Structure (as proposed for Quechua by Hermon (1985)).

    A similar account is proposed in Wallace and Davison for passive
objects. Object marking by -koo is not obligatory, so that some objects
have the same case, or rather absence of case, whether they are in active
or passive clauses. If a direct object has the dative postposition, it
does not lose it as a result of being in a passive sentence and in
being moved to subject position with absorption of object case. Hence the
passive construction may be analyzed as having no instances of move alpha
in the derivation of S-structure. Case is assigned, or not, to the direct
object on the basis of definiteness and animacy. In the derivation of LF,
the object NP may be moved to subject position, retaining its case marking.
The sentences in (14) provide some evidence for the subject properties of
passive objects:

```
14) a.  raam - koo  pulis  - see  piiTaa   gayaa
        R      DAT police-  by    beat-perf.go-perf
```

    `Ram was beaten by the police.'

```
    b.  mãí- nee  [ raam - koo pulis -see piiTee  jaatee  huee   ]
        I     erg.   R      DAT police by  beat-perfgo-impf be-obl.

        deekhaa.
        see-perf.
```

    `I saw Ram being beaten by the police.'

```
    c.  mujh-see  [ raam - koo pulis- see  piiTee  jaatee  huee    ]
        I-obl.-by    R       DAT police- by  beat-pf.go-impf be-obl.
        nahii  deekhaa    gayaa.
        not    see-perf   go-perf.
```

    `I couldn't bear to see Ram being beaten by the police'.

raam-koo in (14) a. is the object in a passive sentence, marked by the
perfective participle on the main verb and the auxiliary jaa `go'. The
dative marking is retained in (14) b, in which the passive clause is the
object of the verb deekhaa, a verb which requires that its complement has
an imperfective oblique verb with an auxiliary huee `become'. The subject

of the complement clause must be lexical, and must have dative marking, a counterpart of Exceptional Case Marking. As in similar cases in other languages like English, the complement subject with object marking has the properties of an object with respect to the verb of the matrix clause. Hence we find that in (14) c., the dative NP is also the object of deekh (unless we want to treat the sentence in (14) a. as an instance of an impersonal passive). But in any case, the very same NP marked as an object satisfies the requirement for a complement subject marked with the dative postposition, a requirement which is the property of object clauses of the verb deekhnaa `see'.

NPs marked as datives have a dual nature. They receive case as objects, direct or indirect; they are syntactically complements of the verb which assigns their case. and grammatical role. These features are ones which are assigned to lexical items, and are instantiated in specific sentence structures, as properties of complements of tokens of a lexical item. But nothing in the S-Structure representation of sentences with experiencer predicates or passive verb phrases marks NP -koo as a subject. Its case marking assigned by the verb reflects its grammatical role, or theta role, of goal or theme. But these NPs also have subject properties in being well-formed antecedents for reflexives and controllers of PRO. Their subject properties are not reflected in the case marking which they retain even when serving as subject antecedents. If dative NPs are also subjects, then they are subjects by virtue of occupying a configurationally defined subject position without having their dative case marking be absorbed by passive morphology (cf Chomsky (1981)) or be replaced by a case marker assigned by INFL, 0 or -nee. Subjecthood is not a grammatical role, and in any case, the dative NP already has a grammatical role, as patient or experiencer. Case does not get absorbed or assigned by inflection, since the dative case is just the case assigned by the verb to its complement. Hence the subject properties of dative NPs must be represented in some other way.

One method of representing subject properties is to say that the dative NP is moved from its origin inside VP to a null subject position. There is no principle which makes it obligatory for the NP to move, no case filter for example. If it does not move, the resulting construction is simply impersonal, with a null subject rather than an expletive it, etc. Sentences such as pitaa -koo kroodh aayaa `father got angry' could equally well be interpreted as examples of an impersonal construction as of a dative subject construction. The tree structure showing movement is as follows:

15)
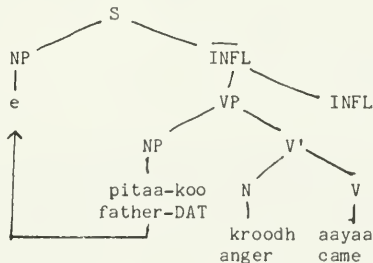
If <u>pitaa-koo</u> is moved to the null subject position, it takes on the subject properties relevant for control and the binding principles, which must hold at LF in this language. It can be the antecedent for a reflexive or a null subject PRO in an infinitive, participial or conjunctive participle clause (cf. Pandharipande (1981) for discussion of the subject properties of the analogous passive cases; see Davison (1969, 1985) for more examples of dative subjects.)

A configurational representation has been proposed in (15) for the subject properties of dative NPs. It is also possible to define in configurational terms the difference between non-finite clauses which require null subjects and syntactic antecedents, and those with optional null subjects and arbitrary readings for them in the absence of a syntactic antecedent. Examples of obligatory and optionally controlled null subjects are illustrated in (16):

16)

a.
```
              S
        /         \
      NP          INFL
                 /      \
               VP        INFL
              /  \
            S'    V
           / \    |
        COMP  S   caah-
             / \   want
           NP   VP
           |    |
          PRO  { V-inf }
               { V-kar }
```

b.
```
                  S
           /            \
         S'             INFL
        /  \             |
     COMP   S            VP
           /       \    /    \    \
          NP       VP  NP     V
          |        |   '      \
         PRO       V  zindagii  hai
              /    |   life      is
            NP   karnaa
                 do-inf.
          pyaar
          love
```
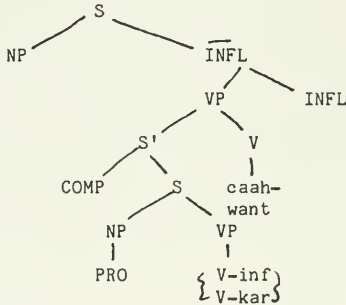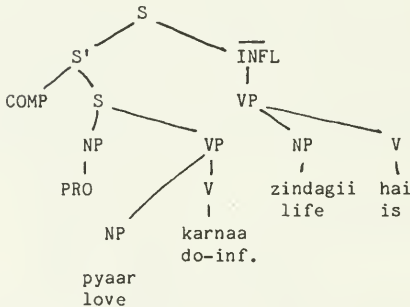
The tree in (16) a. represents object infinitive complements as well as conjunctive participial adverbials as constituents of VP. These complement clauses have obligatorily controlled PRO subjects. The controller must be a subject which c-commands and precedes the PRO subject. The geometrical relation between the complement clause in the VP and the subject position is such that there is necessarily a subject position which both c-commands

and precedes the clause containing the null NP. The opposite is the case
in the tree in (16) b. The complement clause, a subject complement or
adverbial clause, precedes and c-commands any possible antecedents. If the
complement clause is a subject, then there is no subject for it and its
subject to be coindexed with without violating the i-within-i restriction
(Chomsky (1981)):

17) X_i
        $\diagup \quad \mid^i \quad \diagdown$
        $. \ . \ . \ Y_i . \ . \ .$

Identical referential indices on both a subconstituent and the entire
constituent are prohibited. (Cf. Manzini (1983) for a proposal which
relates the control of PRO to the binding of anaphors. There are some
parallels in Hindi-Urdu between control of PRO and the binding of
antecedents and reflexives, which cannot be discussed here.)[6] In the case
of adverbial clauses dominated by S and preceding the subject, an
antecedent is available which does not violate i-within-i. But it is
preceded and commanded by PRO. We will assume that no syntactic binding
relationship is possible here, for the reason that the geometrical
relationship between PRO and antecedent is wrong. It is interesting to note
that overt pronouns cannot be followed by their antecedents and be
syntactically coindexed (Kachru (1978)). Here PRO cannot be syntactically
bound by its antecedent. But in such a case, PRO has the `arbitrary'
reading, allowing for discourse control. The preceding clause counts as
prior discourse, allowing for optional control and none of the strict
requirements that the controller be a subject, etc.

    In (18), the two kinds of relations are contrasted. The version in
which the subject clause has a null subject is grammatical, with the
`arbitrary' reading. The version with the null NP in a conjunctive
participle is ungrammatical, since there is no antecedent, yet clauses
which are VP constituents are obligatorily controlled:

18) a. $\Big[$ PRO$_{arb}$ aisaa   karnaa $\Big]$ deešdroohii   hai
                          such   do-inf.   treason   is

        `PRO to do such a thing is treason'.

     b. $\Big[$ *PRO$_{arb}$ aisaa   kar-kee $\Big]$ deešdroohii hai
                          such   do-CP.   treason   is

        `??PRO having done such a thing is treason'.

The contrast between these two nearly identical sentences is shown in (19)
below:

19) a.

```
                        S
              S'                INFL
          /        \         |
      COMP     S*         VP        INFL
              /    \       /
         NP*      VP     NP          V
          |     /   \     |          |
        PRO   NP     V  deesdroohii  hai
               |     |   treason      is
            aisaa karnaa
            such  do-inf.
```

b.

```
                    S
        NP'                   INFL
         |              /          \
         e            VP            INFL
                    /      \
                  S'        V'
               /     \        \
           COMP       S      NP'        V
                    /    \     |         \
                 NP*      VP deesdroohii hai
                  e      /  \  treason    is
                      NP     V
                       |     |
                    aisaa  kar-kee
                    such   do-Conj-Part.
```

The two sentences (18) a. and b. are lexically very similar but
syntactically different. The non-finite clause is a subject clause in one
((18) a.) and a VP modifier in the other ((18) b.). The null subject in the
subject clause receives the arbitrary reading because the only subject in
its matrix clause which could be coindexed with it is the sentence itself,
and this coindexing of NP* and S* would violate the i-within-i restriction
(Manzini (1983)). The VP modifier clause must have a syntactic antecedent,
which would normally be found in the matrix subject position. But this
position is itself occupied by a null element, which is coindexed with the
predicate nominal (or has no reference, like the expletive it.)

Having just proposed that subject properties of dative NPs should be
represented configurationally, and that the difference between cases of
obligatory and optional control should also be represented
configurationally, we should now see how these two sets of relationships
interact. The critical cases involve complement clauses with null subjects
whose constituents are like those in (15). That is, the null subject
position is also a position to which a dative NP might move in the
derivation of LF. In the case of optional control, that is, non-syntactic
binding, the result is usually well-formed (some exceptions being found for
passive sentences whose meaning could be expressed with intransitive

verbs).[7] In the case of obligatory control, however, the null subject cannot be a subject which has case, a passive patient or dative experiencer.

In the sentences in (19) below, a passive object is the subject of a conjunctive participle (19) a. or of a variety of participial and infinitival adverbials (19) b.:

19) a. [* PRO$_i$ piiTaa   jaa -kar] laRkaa$_i$ calaa gayaa
                  beat-perf. go- CP boy   go go-perf.

        `Having been beaten, the boy went off.'

  b. [PRO$_i$ piiTaa jaanee-par /jaanee kee baad/ jaatee hii
              beat-perf go-on   go-inf. after   go-impf. only]

    laRkaa$_i$ calaa gayaa
    boy   go   go-perf.

    `Having been beaten, the boy went off'.

  c. [PRO$_i$ piT - kar] laRkaa$_i$ calaa   gayaa
             be-beaten CP boy   go   go-perf.

    `Having been beaten, the boy went off.'

The conjunctive participle version is ungrammatical, while the others are not. There is nothing about the conjunctive participle itself which forbids coindexing of the antecedent with a semantic patient. The grammatical sentence in (19) c. demonstrates this, since it involves control of a patient NP which is the subject of the verb piT- `be beaten', which is the intransitive counterpart of the verb piit- `beat'.

Similarly, object complements cannot contain null subjects which would be dative if they were overt. Only the intransitive counterpart of a transitive verb is possible, since it imposes only `nominative' or null case on the patient--subject:

20) a. maĩ$_i$ [PRO$_i$ luTnaa   ] nahĩĩ caahtaa   hũũ
        I   be-robbed not   want-impf. am

    `I don`t want to be robbed.'

  b. * maĩ$_i$ [PRO$_i$ luuTaa jaanaa   ] nahĩĩ caahtaa   hũũ
       I   rob-perf. go-inf. not   want   am

   `I don't want to be robbed.'

Object complements and conjunctive participle clauses may not have dative experiencer subjects:

21)   a. * maĩ$_i$ [PRO$_i$ sird-dard   hoonaa] nahĩĩ caahtaa   hũũ
         I   headache   be-inf. not   want am

`I don't want to get a headache'.

b. mai nahii caahtaa huu [ki   (mujhee)   sirdard hoo]
   I   not   want-impf.am that   I-dat.   headache be

`I don't want to get a headache.'

22) a. [*PRO$_i$ bukhaar   aa-kar]   baccaa$_i$ roonee lagaa
              fever   come-CP   child   cry-inf. begin

'Having gotten a fever, the child began to cry.'

b. [baccee-koo   bukhaar   aanee-par]   maa-koo   taqliif huii
     child-obl.-dat. fever   come-on   mother-dat. worry was

`The mother was worried when the child got a fever.'

The null NP in (22) a., which gets dative case, is ungrammatical in the
conjunctive participle construction, which requires control of null
subject NPs. The infinitive counterpart in (22) b. does not require
control, and does allow an overt dative NP, <u>baccee-koo</u>. Such a NP could be
null, an instance of <u>pro</u>, if there is a discourse antecedent. The
generalization which emerges from the above contrasts of well-formed and
ill-formed sentences is the following:

23) Controlled PRO does not have case.

Whether or not PRO is syntactically controlled depends on the
configurational relation between the clause containing PRO and a possible
antecedent. If there is no antecedent, PRO will not be controlled, and
will have the arbitrary interpretation. If there is an antecedent, but it
follows the clause containing a null subject, control is not obligatory.
If an antecedent precedes and c-commands the clause containing PRO, then
PRO will be controlled. Even so, if PRO represents a subject position
which might have case, it cannot be controlled. The null subjects in (19)
b. and (20) b. are obligatorily controlled by a subject antecedent. But
the null subjects also should receive case. They violate (23), and the
sentences are ill-formed.

A contrasting case of a case marked null NP is shown in the sentence
in (24):

24) a. [PRO$_{arb}$ badlaa   milnee kaa]   mauqaa hai
                    reward   receive-inf of opportunity is

`It's an opportunity PRO to receive a reward.'

b. usee   aachaa   badlaa   milaa
   3psg/DAT. good   reward   receive-perf

'He got what he richly deserved.'

The modifier clause in (24) a. contains a null subject which, as (24) b. shows, normally gets dative marking, and has dative subject properties (Davison (1969)). The modifier clause is in a configurational relation which prohibits coindexing with an antecedent--and in fact none is available. Hence the PRO subject has arbitrary reference and experiencer role; because NP is not controlled, it does not violate (23) even though it has dative case.

Both control and dative subject properties can be expressed in configurational terms. Their intersection produces some unexpectedly ungrammatical results, which can be subsumed under the language-specific principle in (23). This principle defines the properties which some null subjects have, but not others. That is, some infinitival and participial subjects are controlled and others are not. Whether they are controlled is not a property of the clause in and of itself. Rather it is a property of the larger syntactic context in which the infinitive or participial clause is found. In a system of grammatical description which represents the subjects of infinitives and participles only in semantic translation (Gazdar et al (1985)) or in functional structure (Bresnan (1982)), if they are not overt, it would not be possible to generalize in this way about which coindexings with antecedents will be possible, and what grammatical role and case the subject may have. It has been proposed that null subjects have quite specifiable properties, even though they are not overt. Further, these properties depend on syntactic ocnfigurations, and cannot be completely account for as properties of lexical entries for verbs.

<div align="center">ACKNOWLEDGEMENTS</div>

<div align="center">NOTES</div>

[1] Further examples of the conjunctive participle construction may be found in Davison (1980), Kachru (1981) and Abbi (1981). In this paper, I propose a different syntactic analysis from the ones in these papers. Although word order is variable, there is a tendency for conjunctive participle clauses to follow nominative or ergative subjects, and to precede dative subjects in the matrix clause. This tendancy suggests that conjunctive participle clauses are constituents of VP, and not, as I proposed earlier, adjuncts of S.

[2] Not all complements of verbs etc. are lexically realized in every instance of use. Hindi-Urdu has null pronominals, or pro, whose reference is recoverable from discourse context. Lutz (1985) discusses a number of examples of null pronouns, whose reference is determined by discourse topic rather than by rules of grammar or morphological information.

[3] There is a small number of permitted exceptions to this requirement, which have not been fully explained either for Hindi-Urdu or for other South Asian languages with similar constructions, such as Tamil. In productive uses of the construction, there must be a null subject controlled by a matrix clause subject.

[4] In general, transitive verbs have -nee subjects. See Porizka (1963:425ff) for an overview of exceptions, such as bhuulnaa `forget', which is transitive but may have a nominative subject, and ciiknaa `sneeze', which is intransitive but requires a -nee subject.

[5] Note that this example illustrates the freedom of word order allowed in Hindi-Urdu. The conjunctive participle clause is right-dislocated. I am assuming that this word order reflects the possibilities allowed by Phonetic Form, without affecting the syntactic relations which are relevant for S-Structure and LF.

[6] In brief, the antecedents of both reflexives and obligatorily controlled PRO must precede what they are coindexed with, and must be subjects. If Binding Theory principles apply analogously to both PRO and anaphors, then they should apply at the same level of description, in this case at LF. The Binding Thoery principles relevant for variables must apply also at LF, because the semantic scope of variables is not directly indicated at S-Structure (Davison (1984)).

[7] It is interesting that backward pronominalization is not possible except with prior mention of the pronoun referent. In isolation, the following sentences contrast in well-formedness:

i)[agar raakees$_i$ koo Digrii mil gaii,] too woo$_i$ waapas calaa
   if   R.   dat. degree received then 3psg return   go

   jaaeegaa   `If Rakesh got his degree, he will go back'.
   go-fut.   (Kachru (1978:13))
ii)[*agar us$_i$ koo Digrii mil gaii,] too raakees$_i$ waapas
     if   3psg-DAT degree received then R   return
     calaa jaaeegaa. `If he got his degree, Rakesh will go back
     (Ibid)

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PRIMITIVENESS, NATURALNESS, AND CULTURAL FIT

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Abstract

Early attempts to identify special characteristics of
"primitive" languages failed and linguists' current atti-
tudes toward the notion imply a definition of primitiveness
that effectively means that no such attempt can ever succeed.
The development of markedness and naturalness theories were
not related to stagial evolution but were nonetheless efforts
to characterize and distinguish the linguistically normal from
the possible but rare. That is, they were attempts to try
again to understand why some languages behave more oddly than
others.

Some languages have an unusual use of the genitive as
beneficiary where most use a dative. These seem particularly
appropriate to the simplex societies they serve, and a full
understanding of syntactic naturalness may require considera-
tion of cultural variables normally regarded as extra-lin-
guistic.

...it is not really possible to understand what is being said
in linguistics today without knowing the history of the field,
without knowing what events led up to the current issues that
are being argued today. --Theodore M. Lightner (1968:46)

When our scientific ancestors became aware of the range and distri-
bution of linguistic forms and processes, they found scanty evidence that
could be adduced in support of stagial evolution. Latin, the language of
an archaic state level society, had, for instance, five or six cases but
the Finno-Ugric languages had three times that many and they were spoken
by peoples still at or recently evolved from the tribal or chiefdom levels
of sociocultural complexity. Chinese, serving a state level society for
millenia, had none. The most powerful state level sociocultural system of
the New World, the Aztec, had a language much like and closely related to
languages spoken by foraging (hunting/gathering) bands of the Great Basin
and Plateau. The attempt to relate cultural evolution and levels of socio-
cultural complexity to grammatical characteristics had by mid-century
largely been abandoned. The effort to relate cultural evolution to gen-
erality v. particularity in the lexicon was more tenacious and in 1952
A. A. Hill felt bound to remind colleagues that "...most modern linguists...
reject the idea of the inefficiency, formlessness, and overparticularity
of primitive speech...." (Hill 1964). He reviewed much of the representa-
tive literature on the matter and his article of the early fifties provides
one of the last instances of that period in American linguistics of
linguists talking to each other about primitiveness.

The watershed year of 1957 was not far gone, however, before questions of evolution in language began to reappear sporadically in the professional literature. Dell Hymes returned to the lexical issue in 1961, albeit in a somewhat different vein than that in which Hill had left it in 1952, and he argued for an evolutionary perspective on lexical expansion and on some sociolinguistic variables. He largely "by-passed" the issue of evolution in grammatical characteristics, regarding the denial of such evolution however as unproven. Ten years later, Hymes was at least suggesting the possibility of evolutionary changes in syntactic processes, for in his forward to Swadesh' posthumously published work, he has this to say:

> It is with respect to certain linguistic functions, not all, that evolutionary advance can be clearly seen--in the lexical resources that differentiate languages of science,...and in the syntactic developments that make certain kinds of argument and analysis explicitly available. (Hymes in Swadesh 1971:ix)

The effect of Berlin and Kay's work on cross cultural study of color terminology upon linguistics was probably not as great as its effect upon cultural anthropology, primarily because of the evolutionary implications it contained. (Note especially Berlin 1970 for a succinct statement.) In short, they found that societies with few basic color terms tend to be the simpler band and tribal level ones. A number of anthropologists regarded this work as highly ethnocentric, even though Berlin and Kay also presented evidence that color perception and definition is very much alike among all humans. That is, the evolutionary implications of their work were not with respect to somatic factors but rather with regard to sociocultural systems. The resistance seems to have come largely from the fading but still noticeable resistance in cultural anthropology to any evolutionary theory or explanation of culture whatsoever. This antievolutionary position is still evident in British social anthropology and R. M. W. Dixon's discussion of cultural differences (Dixon 1980:5-7) seems informed by this stance.

The reappearance of positions favoring an evolutionary perspective in the professional literature have dealt largely with the lexicon. With respect to syntacticosemantic characteristics, precious little has appeared, although some of these scientists have anticipated such investigation. We noted Hymes' comment above, and in 1970, Berlin predicted that

> When one looks at language as an adaptive mechanism, there is every reason to suspect...that one will eventually be able to make non-obvious and non-trivial generalizations about the lexical and grammatical structure of languages spoken by primitive peoples which can be interpreted within a cultural materialistic theoretical framework. (Berlin 1970:16) [Italics mine--JFF]

But with rare exceptions, including Webb 1977, Foster 1980, and Givon 1979, little work toward helping Berlin's prediction come true has been done. Most linguists still hold to the view that there are no primitive languages, no "survivals", i.e. relics, of primitiveness in otherwise non-primitive languages, and that "every language is adequate to its purpose", whatever that might mean.

To be sure, we sometimes talk of evolution with respect to diachronic subdivision and "speciation" of language families from a protolanguage. Goodenough (1980:36-41) is an example. The extinction of a protolanguage and its replacement with several related but mutually unintelligible daughter languages is somewhat analogous to biological speciation and, in that sense, "evolutionary". Unlike biologists and physical anthropologists, however, linguists make no assumption that the protolanguage was in its structure more like the earliest true human languages of the paleolithic than are any of the daughter languages. In this respect, the use of the term evolution in historical-comparative linguistics is misleading.

This sometime use of evolutionary notions in historical-comparative linguistics is also quite different from the notion of cultural evolution in cultural anthropology. Foraging bands, such as the !Kung or baMbuti Pygmy, have relatively simplex stone and bone technologies, have reciprocal exchange and egalitarian access through the group to the basic goods, resources, and means of production, have little or no political organization nor political offices, no warfare, and have religions oriented around ritual rather than around morals and ethics. The dominant theoretical perspectives, or paradigms, in modern cultural anthropology hold that such peoples really are more like the sociocultural systems of paleolithic humans than are the complex chiefdoms and even more complex state level societies. With this in mind, consider that

> ...as has often been pointed out, there is today no such thing as a 'primitive' language; every language is of approximately equal value for the purposes for which it has evolved [italics his--JFF] whether it belongs to an advanced or a primitive culture. (Samuels 1972:1)

This statement of course begs the whole question. One might as well assert that because lungfish and lemurs are each highly adapted to the environments in which they live, there is no such thing as a primitive animal. What we ought rather ask is whether there are "purposes" that are significantly associated with primitive societies versus complex ones, or conversely. The answer of cultural anthropology is of course in the affirmative, although many of us would avoid the teleological assumptions implied by the choice of the term 'purpose'. Linguistics might well ask whether there are linguistic structures primarily associated with the one but not the other of these "purposes", or conversely. But of course as pointed out at the beginning of this essay, early linguistics did ask similar questions and with largely negative results. That is why most of us would agree with Samuels' claim, although he states it in such a way that probably renders it unfalsifiable.

Since apart from still rather sporadically appearing studies largely pertaining to lexica (with exceptions noted above on syntax) linguists generally do not believe there are or can be any primitive languages, we usually do not write articles for each other about them. To learn what linguists think that primitive languages would be like if there were any, we must go to the one place where linguists regularly do talk about primitiveness-materials for the public and especially for beginning students. Roger Brown, dealing primarily with abstraction in the lexicon,

says that: "...pre-literate languages are not primitive but it is probable that the people speaking these languages are nearer the primitive way of life than are the members of modern civilized states." (Brown 1968:272). Brown cautiously lands on the side of those claiming relative sparsity of generic terms in the lexica of primitive peoples and he uses the term primitive in a way very reminiscent of its use in biology and physical and cultural anthropology. Paul Gaeng (1971:8) holds that

> Anthropological research has conclusively shown that even the most primitive tribal societies of our time possess highly developed structures and complex languages with rich vocabularies. Any differences that may exist between the languages of primitive communities and our highly sophisticated cultures lies in the number of ideas and concepts that require expression rather than in the way in which they are expressed.

Gaeng's statement has the merit of being empirically falsifiable. Karen Webb has given presumption of evidence (1977) that the only languages likely to develop transitive verbs of possession like English 'have' are those that serve state level societies with differential ownership and stratification based on unequal access to the basic means of production. Her sample was small but the distribution was statistically significant (p = .0223, Fisher Exact Test) by a conservative measure, so that indeed Gaeng's claim may have already suffered falsification.

One of the least dogmatic and most judicious statements about there not being any primitiveness in language is that of Ronald Langacker (1973:17).

> Language and culture are closely associated in practice..but there is no reason to believe that any particular type of linguistic structure is specially suited to any particular type of culture. ...In fact...there is no correlation between degree of cultural advancement and complexity of linguistic structure....

There is a vast difference between asserting that "There are no X." on the one hand and reporting on the other that "We have no reason to think there are any X." One finds it hard to disagree with the Langacker statement-- but then one finds it hard to say what exactly the last part of it means. The absence of such correlations may be no more than a function of our imperfect understanding of language and our inability to agree on any measure of "complexity of linguistic structure"--even after a quarter century of simplicity metrics.

The development of simplicity metrics was supposed to help us evaluate possible grammars; the development of markedness theory was supposed to help us evaluate languages in the sense that it provided a principled and systematic way of characterizing unnatural phonological systems and accounting for certain kinds of recurring phonological change. It was a shock initially to one nurtured as I had been in the "all languages are equal" school to find us "judging" languages again, but in my mind's ear I can yet hear Ted Lightner pointing out of some language with an odd rule or very unusual series of segments that "the grammar of this language

ought to pay in relative complexity for the privilege." He was of course absolutely right. A theory of language claiming that Bushman clicks are not a possible linguistic consonant series is wrong. But a theory asserting them equally as natural to language as /p,t,k/ is bizarre and would now be regarded as preciously naive.

Though it did not incorporate evolutionary considerations, markedness theory forced us to deal with the observation that not all phonologies are equal. Dell Hymes pointed out that other linguistic inequivalencies exist.

...differences in adaptation and advance in respect to specific criteria do not disappear if ignored. To address the real problems of the place of language in social life, one must...deal with cases wherein different varieties of language do and mean different things. (Hymes in Swadesh 1971:ix)

Because, however, of the earlier history of linguistics, most of us have had a tendency to assume that any language subject to linguistic analysis, i.e. all languages, is a post-primitive language. Thus Greenberg wrote:

All known human groups have complex languages which exhibit essential similarities in their over-all structure. It was once thought that peoples with extremely simple technologies, so-called primitives, must have languages of a more rudimentary type than those of the more technologically advanced peoples. This turns out not to hold at all for grammar. ...
    The most important proof of human cultural similarity is that languages all exhibit certain basic structural traits, so that the techniques of scientific linguistics are applicable to all languages. (Greenberg 1977:75)

This is of course difficult to disagree with, although Webb's possessive predication study (Webb 1977) appears to falsify the first paragraph. Note that the second paragraph is very like saying that all organisms show certain structural and processual traits so that the techniques of scientific biology are applicable to all organisms. This is true but does not preclude their being significant differences in organisms that can be understood in an evolutionary perspective. Cockroaches are more primitive than canines, though both are highly "efficient" and coherent organisms. We must recall that we abandoned considerations of primitiveness when both linguistic theory and cultural anthropology were much less sophisticated and powerful than they are today. I do not know whether antipassives are more typical of languages spoken in simplex societies than complex ones, but if we never ask because by definition all describable languages are post-primitive, we'll never know.

Cambridge University Press' promotional literature on Dixon's 1980 study of Australian languages says that: "The author stresses that these languages are in no sense 'primitive' languages, but have a rich and complex grammar with many subtle and distinctive features." For the copy writer, linguistic primitiveness means a lack of subtlety and a lack of "distinctive features". Now cultures at the band level certainly have distinctive features and their peoples are certainly capable of "subtlety" by any definition of that word we are likely to agree on.

Likewise, single-celled organisms have distinctive characteristics, else they would all be classed together as one species. In fact, single-celled organisms are in a sense "hyper-sophisticated" since they perform with one cell functions that in more complex organisms are done with cell specialization. If biologists defined their domain of study the way we linguists define ours, single-celled organisms would not be regarded as living things. If cultural anthropologists operated similarly, most Australian aboriginal and other foraging band peoples would not be classed as human cultures![1]

Suzette Elgin does not beg the question by defining it out of existence--at least not to begin with.

> When contemporary peoples are described as primitive,...usually what is meant is that the group described lives in a manner more consistent with what we assume to be true of prehistoric man's life than with our own....
>
> It may be that primitive humans, in the strictest sense of the word, spoke primitive languages. But we know nothing at all about any such language.... We cannot point to any language and say, "This is what a primitive language is (or was) like....
> (Elgin 1979:202)

In effect, she says that we don't know what primitive languages might have been like and we can't seem to find any extant language for which there is a principled basis for classing it as primitive in any scientific (non-judgmental, amoral) sense of the word. Now this is largely true and introductory texts are hardly the place perhaps to delve into the few instances where it may not be true. But then Elgin goes on to close the issue with a definition of primitive language which, if we take it seriously, will make sure that we never find any.

> For the linguist, then, the term <u>primitive</u> <u>language</u> can have only one useful meaning: a language which would be inadequate for ordinary human communication. Such a language might have no mechanism for adding a new word when a new object was introduced into the culture of the people speaking it, for example.

There is probably about the best, most judicious, statement one could come up with for a beginning text. But we're not evaluating introductory texts; we're using them as a source of information to deduce what our profession thinks a primitive language would be like. If we define 'primitive language' as only those known not to exist, we have deftly closed the issue without having grown any the wiser in the process.[2]

Since I clearly want to reopen the case, let me make it clear that I do not think it will be easy to develop a general set of criteria for linguistic primitiveness. It will be hard for several reasons, one being our history reviewed in this essay. But there is a difference between saying on the one hand that primitive languages don't exist because we haven't found any versus saying on the other that they don't exist because our definitions of language won't let us find any. One is scientific restraint; the other is perilously close to dogma. These definitions are themselves the product of a history and cultural process which generated a profession that formed its healthy skepticism about primitiveness as a result of specific, understandable, conditions. Given the conditions

under which linguistics grew up, especially in the New World, we could hardly have come to any other conclusion. Progress in science requires that productive assumptions which have failed of disproof after considerable effort become something like dogma. As has been quipped before, science normally progresses of necessity by closed minds. But it also becomes stagnant by closed minds, and the path down which we arrived at exclusionary definitions about primitive languages may be quite understandable but it does not compel us to refrain from rethinking the investigative strategies reflected in these definitions--particularly since we now have much greater sophistication about the nature of grammar, much better typological tools, and more powerful insights into the nature of cultural evolution than when our history was in the making.

Elgin's statement and others of its ilk provide a good initial point for reopening the investigation. The nonexistence of primitive languages is often argued on the basis that every language is "adequate to its purpose", for "ordinary human communication", or the like. In adopting such a claim, we have left an opening to ask whether some languages are in this respect more adequate than others. Is "ordinary human communication" the same in industrial states as it is among foraging bandspeople? The answer is certainly no, not entirely. We may, that being the case, ask whether there be any grammatical processes which seem particularly given to association with the expression, predication, or discussion of notions and assumptions about the world more commonly found in band and egalitarian tribal societies. Conversely, are there any such grammatical operations that seem especially given to use with notions or assumptions more commonly associated with stratified societies? If the answer to either or both these questions turns out affirmative, then there are primitive and post-primitive grammatical processes in language, for, as Elgin said: "...usually what is meant [by primitive peoples] is that the group described lives in a manner more consistent with what we assume to be true of prehistoric man's life than with our own." (Elgin 1979:202)

The work of Webb (1977) with regard to intransitive v. transitive predication of possession has been noted above. Recall that there is a statistically significant tendency for languages with transitive predication as the usual way of saying 'I have a new house.' to be spoken by state level societies. I have proposed elsewhere (Foster 1980) that a structure which predicates possession with possessor as subject of a transitive verb in the nominative case is a significantly rather than superficially different kind of structure from the predication of possession by a transitive ergative structure with possessor "subject" in the ergative case. This being so, then transitive active predication of possession on the one hand as contrasted with either transitive ergative or intransitive predication of possession on the other fit Hymes' "...cases wherein different varieties of language do and mean different things". From an entirely different set of considerations, Talmy Givon has proposed that SOV languages were more apt to have served our prehistoric lithic ancestors than other types of basic word order languages. (Givon 1979. See especially Chapters 7 and 8.) As a final example, there are at least two languages, De'kwana of Venezuela and Dyirbal of Australia, which use the genitive case as the normal case of the recipient-beneficiary where most languages use a dative and

despite the fact that both these languages do have a dative case. Consider
for instance the English utterance

    (1)   @* The man gave the woman's beans.

The symbol '@' represents a sentence which, whatever its grammaticality,
is culturally anomalous. As (1) stands out of any context, it is not an
English sentence. If it means anything at all, it means that the man took
beans properly belonging to the woman and gave them to some third party.
In a dialogue like (2), it works linguistically, however illegal or acustomary
the implied activity might be.

    (2) "I'm giving my squash to the church bazaar and Sally's
          giving her tomatoes. What're you gonna give?"

     @ "Oh, I'm giving my neighbor's beans!"

In no instance would English (1) ever be taken to mean that the recipient
of bean-giving was the woman possessor of the beans, marked with the gen-
itive case suffix.

    Similarly in rural Welsh, sentence (3) is anomalous and woman, the
possessor of the rabbit, is not understood to be the recipient.

    (3) Welsh: @* Mi rodd ef y gŵr y geinach y ddynes.

                 Past give he the man the rabbit of:the woman
                 'The man gave the woman's rabbit.'

In German there is in principle a possible ambiguity since in the feminine
declension, the case for genitive and for dative are homophonous, although
the ambiguity chance is somewhat reduced by the normal tendency of the
genitive to follow the possessed.

    (4) German: Der Mann hat der Frau Böhnen gegeben.
                the man   has   DAT/GEN:the woman beans given
                a. 'The man gave the woman beans.'
                b. 'The man gave the woman's beans.'

In fact, all native speakers of German take the (a) interpretation, and
no speaker likes the sentence

    (5) German: *Der Man hat die Böhnen der Frau gegeben.

if it means that the woman is both the possessor and recipient of the beans.

    Leaving Indoeuropean, we find Turkish with both a genitive and an allo-
dative case and a similar situation.

    (6) Turkish: @Adam hanɯm - ɯn tavşan - ɯn - ɯ verdi.
                 man woman - GEN rabbit - POSSESSED - OBJ   gave
                 'The man gave the woman's rabbit.'

In general, a recipient is in the dative case and not the genitive. Now,
Dyirbal, like English, Welsh, German, and Turkish, makes a dative/genitive

distinction and Dyirbal, like Turkish, has an allative-dative case. However, in the Dyirbal equivalent, the recipient and possessor is in the genitive. (Dyirbal examples are all from Dixon 1972.)[3] That is, the woman is the owner and recipient of the beans, and the sentence is perfectly normal and the usual way of saying this in Dyirbal.

(7) Dyirbal:
balam mirañ baŋun ḍugumbil - ŋu bangul yaɽa - ŋgu waga-n.
CLASS beans:NOM CLASS woman-GEN CLASS man - ERG gave/gives
'The man gave the woman's beans.'

The English translation is of course our anomalous example (1). Perhaps a closer translation would be

(8) The man gave the woman's beans to her.

Dyirbal, however, does not say it that way, primarily because the Dyirbal and European make quite different assumptions about what giving is, and the normal Dyirbal sentence does not imply, in contradistinction to the English in example (8), that the beans would have been given by a rational person to anyone else, nor that the option not to give the beans exists.

The key to the linguistically unusual use by Dyirbal of the genitive in these instances is that in Dyirbal, the simple genitive is used to indicate the possessor by right. Dixon refers to this structure as proleptic, and indeed to us it does involve a kind of treating of a future event as though it had already happened. But in a less ethnocentric sense, it is not really quite the same thing as our philosophical notion of prolepsis. Primitive societies are sacred societies in which everything is in micro- or macrocosm really the same thing. The giving here is not in the Western sense at all but a transfer of material to the control of the person who is the rightful controller of it. This right is determined, not through a market economy, not through that person's own effort or agency, but rather through that person's relation to the bestower of control, the "giver" as defined by the kinship system. Dixon points out (1972:30-1, 237) that spontaneous and "unnecessary" giving is uncommon among the Dyirbal but that socially necessary giving in the sense of control transfer goes on all the time. For instance, a relative of a hunter has a right to a portion of the meat that hunter brings in and thus that meat already belongs to that relative. Possession among the Dyirbal of comestibles and other material is overwhelmingly an ascribed relationship, not an acquired one by an individual's own efforts as it is in state level societies. Dixon in fact noted (1973) this cultural difference with respect to non-nuclear verbs of giving (like 'carry') but has not related it to an evolutionary pattern. Indeed, if his comments in his 1980 (4-7) work are an indication, he would probably reject any notion of cultural evolution whatsoever, let alone linguistic evolution. But most anthropologists will recognize that these patterns of ownership, vesting, and kin-based reciprocal rights and obligations can be found with varying of minor details in almost any band level or tribal level society. This is in fact a noted characteristic of primitive cultural systems and of the earliest stages in the evolution of sociocultural systems. (See Harris (1985:228-31) for a concise clear discussion of ownership and reciprocity in primitive egalitarian societies.)

Half a world away in Venezuela live another primitive people, the
De'kwana. Katherine Hall (personal communication) of Washington University
has found in her study of these people examples which show a use of the
genitive in very much the same way that Dyirbal uses it. The two in-
stances are of course not homologous in that they derive from a common
protolanguage ancestor; they of course do not. De'kwana is Carib and
Dyirbal is Australian. Rather, this similar unusual use of the genitive
to indicate the recipient is homologous in the two widely separated lan-
guages because it is a strikingly natural way for a language spoken in
these kinds of societies to express these concepts.

(9) De'kwana: moño wo:di tunuwa:dü kü:müi nutui Pedro
              this woman her-brother:GEN machete gave Pedro

    suku:hi küntui'chü wö konnadö
    spear   gave   ind. obj. yesterday

    'This woman gave her brother's machete(who) Pedro gave a spear
        to yesterday.'   i.e.,
    'This woman gave a spear to her brother to whom Pedro had given
        a spear yesterday.'

How many languages there are like this we do not know. The fact that
there are two half a world apart and that both serve primitive egalitarian
societies suggests that there may be more, but probably not many more.
Dakota has conditions on its use of possessive pronouns somewhat reminiscent
of the cultural characteristics which seem to have engendered the Dyirbal
and De'kwana phenomena, as Boas and Deloria (1938:128) indicate:

    Natural Objects like land, water, animals including the dog but
    excepting the horse cannot take the possessive pronoun, because
    under aboriginal conditions they could not be the exclusive prop-
    erty of anyone. Food also is not used with the possessive pronoun
    except in the term awete 'his food supply', with the meaning of
    'his means of extending hospitality'.

The Dyirbal and De'kwana languages use as grammatical and culturally
normal linguistic forms whose analog in most other languages is ungram-
matical without contortion and culturally anomalous in that it uses the
genitive case as a recipient marker. It is difficult to escape the con-
clusion that these languages behave in such a generally unnatural way
because they are specifically and superbly adapted to serving just such
a primitive egalitarian society as the Dyirbal and De'kwana have. These
are societies in which the notions of ownership and exchange are those
common to band and tribal societies--societies more like those of our
lithic ancestors than our own. These languages with respect to the syn-
tacticosemantic feature we have examined are particularly adapted to the
service of primitive sociocultural systems. In this respect, these are
primitive languages.

It ought to be made clear that the term primitive is used analytically
and taxonomically, not judgmentally. It is also clear that a primitive
language need not remain one, for there is evidence that Dyirbal is trying
to change to meet the new circumstances such that they are now contained
within and subject to a property-based stratified state. Dixon (1972:108-9)

shows that some Dyirbal have modified their language to accommodate the
fact of radical difference between European exchange based on a market and
their own system based on reciprocity and kinship. Dyirbal has a second
genitive, called by Dixon the past, or general, genitive. It is used to
indicate such things as 1) a deceased possessor, 2) a possessor who has
lost some object rightfully their's, or c) when suffixed to the proper
name of the mythical creator and culture hero, it marks an object so old
its origin is forgotten. There is now, however, a fourth use of the past
genitive, and that is in the derivation of an adjectival phrase modifying
an object given or sold, i.e. acquired by "White Man's giving".

    (10)   ŋayguna yaɾa-ŋgu minban margindu waybala-mi-gu
            I-ACC man-ERG   shot   gun-INST white:man-PAST GEN-INST
             me   man-by   shot   gun-with   white:man-used:to:be's-with
            'A man shot me with a gun from the white man [i.e. which
              the white man sold him.]

Primitive languages there are, but there may not be many left. Those
which do not die are apt to adapt like Dyirbal is doing. When the
Dyirbal have become fully acculturated to European market economies,
their normal use of the genitive will become extinct. The next few
decades may be humankind's last chance to think about evolution in
language while we can still do anything empirical about our thoughts.

<center>NOTES</center>

[1]Australian kinship used to be commonly adduced as examples of
great complexity of social organization among a technologically primitive
people(s). Cultural idealists took these systems as apparent counter
examples against cultural materialist deterministic explanations of cul-
tural development. In fact the Australian 8-Section system was shown by
Service (1960) to be derived by a few simple rules including a) moiety
division, b) intramoietal generation subdivision, and c) cross cousin
marriage delay. Moreover, the distribution of the system in Australia
turns out to have ecological, i.e. material, causes. A note of Service'
is pertinent here (1960:43):

    ...Many anthropologists have regarded Australian social organi-
    zation as very complex because of the presence of the class
    [i.e. section, not social class] system, and they have used this
    as an argument against the theory of cultural evolution; that
    is, they argue that evolutionists assume that a simple tech-
    nology must be accompanied by a simple social organization,
    but technologically primitive Australians have an 'advanced'
    (complex) kinship system; Hence [sic] evolutionist assump-
    tions are wrong.

The position Service rejects as irrelevant is exactly the one Dixon
espouses (1980:6) in saying that, respecting social organization,
"Europeans appear to be primitive by comparison with Aboriginal Aus-
tralians; all Australian tribes had elaborate and well-articulated

kinship systems...." Dixon apparently equates the somewhat technical and analytic term <u>complex</u> with the common notion of "complicated" or "elaborate". As to the claim that Australians have a "well-articulated" kinship system, it is empty in the absence of any indication of what an "ill-articulated" system might be like. Certainly no cultural evolutionist of modern times claims any kinship system, primitive or otherwise, as not being "well-articulated", whatever that might mean.

[2]Hymes seems to approach this point in his 1961 discussion of three stages of evolutionary "advance". I read him as at least implying that linguists have confused the nature of evolutionary [v. secular] change, and have defined primitive languages out of all possible existence.

[3]It is due to the insights of R. M. W. Dixon's excellent grammar-ethnography of the Dyirbal that these examples can be adduced here. I am grateful to Dixon for reading an earlier version of this essay and absolve him of any responsibility for the use to which I am here putting the data he has so wonderfully furnished.

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ON GLIDES FOLLOWING VOCALIC VERBS IN RUSSIAN

Frank Y. Gladney

Russian has several dozen lexical verbs ending in a
vowel, although this is denied by the single-stem
analysis inaugurated by Jakobson 1948. When these
lexical verbs occur in verb forms before vocalic
elements such as the present theme -e- or the imper-
fective theme -a-, they are always separated from
them by a nonsyllabic segment; hiatus never occurs.
The hiatus-filler is sometimes consonantal, as in
vsta-n-et 'will get up' and vsta-l-a '(she) got up',
but the paper is mainly concerned with nonconsonantal
hiatus-fillers, as in vsta-v-al '(he) was getting up'
and vsta-j-et 'gets up'. Arguments are presented
that the hiatus-fillers are not lexical. Rules for
introducing -v- and -j- are discussed.

By verbs I do not mean verb forms. A verb form is a sentence segment
comprising a stem and a verb ending. There is no general agreement on
how verb forms correspond to lexical items, but in this paper "verb" refers
to the lexical item preceding the ending in a verb form. Thus $[_V$ $]$ de-
limits the verb form, and the stem-ending structure of the (simplex) verb
form is represented as $[_V$ V E $]$.[1] A vocalic verb is one which ends in
a vowel, specifically a nonconsonantal segment. There are around 40 vo-
calic verbs in the Russian lexicon, including some quite common ones like
the cognates to be, do, stand, and know, as in byl 'was', del 'put', stal
'stood', and znal 'knew'.

I also do not mean verbs which are vocalic on the surface as the
result of a phonological rule. Vel 'led' minus the past-tense ending is
ve-, but 3sg. vedet shows the verb to be /ved/. The vocalic shape seen
in the past-tense form is the result of a cluster simplification, /ved+l/
$\longrightarrow$ vel. The proposal to distinguish vocalic verbs like /sta/ from con-
sonantal verbs like /ved/ will be challenged by many Slavists. Ever since
Jakobson 1948, the enduring influence of which owes much to the work of
Morris Halle and Theodore M. Lightner, many Slavists have held that verb
forms like stal and znal show a vocalic verb for precisely the same reason
as vel does: underlying /stan/ and /znaj/, seen in 3sg. stanet 'will
stand' and znajet 'knows',[2] undergo truncation before 1, /stan+l/ $\longrightarrow$ stal,
/znaj+l/ $\longrightarrow$ znal. So before I can discuss vocalic verbs I must show that
the lexicon of Russian indeed contains such items. I must show that the
n of stanet and the j of znajet are thematic elements inserted in these
forms, not root elements present in the lexical representation.

Why does it matter? Because in Slavic the introduction of thematic
elements between the verb and the ending is the chief morphological
mechanism of verbal aspect, and morphological aspect is what makes Slavic
unique among the Indo-European languages. Other languages also make aspect
distinctions. In English we can say I urged him for three hours but not

*I convinced him for three hours (in the relevant sense); we can say It took me three hours to convince him but not *It took me three hours to urge him. A Slavist is tempted to call urge imperfective and convince perfective. Or compare "imperfective" lived in She moved to St. Louis and lived there for many years with "perfective" lived in She drove her Saab over a cliff and lived. Recent literature makes it increasingly clear that Slavists do not own verbal aspect. Slavists themselves (e.g., Kučera 1983) have begun to question some of the claims made for aspect in Slavic, for instance, Jakobson's view of perfective/imperfective as a privative opposition with an invariant meaning being signaled by every perfective verb form. Nevertheless, only in Slavic is perfective/ imperfective morphological, that is, a matter of verbal inflection. A number of Indo-European languages show thematic differences among verb forms. Lat. occupatus 'occupied' differs from captus 'seized' by the thematic a following the root. The distinction between drinks and drenches was at some early point in Germanic primarily thematic and syn- tactic. Moreover, a number of languages use verbal particles to express aspect distinctions. We can say I turned it for three hours but not *I turned it off for three hours (in the relevant sense); we can say It took me three hours to turn it off, but It took me three hours to turn it imposes a "perfective" reading on turn. Only in Slavic, however, does thematization team up with verbal particles (prefixes) to express basic grammatical oppositions. The perfective, hence future, forms vsta-ne-t 'get up', spas-e-t 'save', and vnes-e-t 'carry in' become im- perfective, hence present, with a change in thematization to vsta-je-t, spas-aje-t, and vnos-i-t (all 3sg. forms). Compare also pfv. vsta-1 'got up', which is athematic, with impfv. vsta-va-1 'was getting up'.

   The view of vstanet and vstajet as aspect-sensitive thematizations of a single underlying [$_v$ vŭz sta t] is consistent with the view, which is widely held although not universal, that pfv. vstanet/vstal and impfv. vstajet/vstaval are inflectional forms of the same prefix-verb compound, rather than forms of two derivationally related verbs. If vstajet/ vstaval were derived from pfv. vstanet/vstal, we would expect it to contain a derivational suffix. But a suffix is out of place if all are inflectional forms of the same verb. Vstajet and vstaval are examples of what is referred to in the title of this paper: a vocalic verb followed by a glide. Phonetically, j and v may be consonantal in varying degrees: j is more consonantal before a stressed vowel as in vstajet than before an unstressed vowel as in znajet, and v is strongly con- sonantal when devoiced as in vstav 'having got up', less so when voiced (the v in common expressions like soveršenno 'perfectly' and pravil'no 'right' is regularly elided). But underlyingly j and v are glides; see Coats & Harshenin 1971. These two segments play a prominent role in verbal inflection in Russian, mainly with vocalic verbs. Accounting for their distribution is the main concern of this paper.

   Prior to Jakobson 1948 the received analysis of the Slavic verb was the one bequeathed by historical-comparative grammar, set forth, for example, in Leskien 1909:182-189. According to Leskien the forms of the verb are built on two stems, a present stem characterized by present themes and a past stem which is characterized by past themes or is athematic. The primary classification is by present theme, with

subcategorization by past theme. A further subcategorization distinguishes vocalic verbs (vokalisch auslautende Wurzel) from consonantal. There are five main classes, with present themes as follows: I -e- (vedet), II -ne- (kriknet 'will shout', stanet), III -je- (znajet, pišet 'writes'), IV -i- (prosit 'requests', stoit 'stands'), V athematic (only two verbs in modern Russian, est 'eats' and dast 'will give'). Verbs in -et constitute the first conjugation, verbs in -it the second. Class I includes IA, which is athematic in the past (vel), and IB, which has a in the past (soset/sosal 'suck'). Class II verbs regularly follow n with ow in the past (kriknul; stanet/stal is exceptional). Class III verbs can be athematic in the past (znal, porol 'flogged') or can have thematic a (pisal); they may also precede je with a vocalic theme and this may be a (čitajet/čital 'read'), ē (vladejet/vladel 'possess'), or ow (torgujet/ torgoval 'trade'; ow monophthongizes before j in the present but is followed by a in the past).[3] Class IV includes IVA, which has i also in the past (prosil), and IVB, which has ē in the past (sidit/sidel 'sit').

Jakobson combined Leskien's two stems into a single "full" stem based on the longer of the two. His single-stem description hinges on two main morphophonemic rules: stem vowel truncates before vocalic (present) desinences, and stem consonant truncates before consonantal (past) desinences. Full stems for some of the verbs in the preceding paragraph are: ved-, sosa-, stan-, kriknu-, znaj-, pisa-, čitaj-, vladej-, torgova-, prosi, and side-. The vocalic stems select the appropriate present desinences (the first four -et, the last two -it) and undergo truncation (sos-et, krikn-et, piš-et, torguj-et, pros-it, sid-it), while the consonantal stems remain intact. But before the past desinence the consonantal stems undergo truncation (ve-l, sta-l, zna-l, čita-l, vlade-l), while the vocalic stems remain intact. Jakobson's full stems carry roughly the same information as Leskien's classification, but they make fuller utilization of the entailment relationships among verbal themes. Since a in the past alternates with e in the present (sosal/soset) in only a dozen and a half verbs while a alternates with je (pisal/pišet) in around 80 (plus an unlimited number in which the alternants are preceded by ow-- torgoval/torgujet), Jakobson considered je regular in verbs which show a only in the past (that is, those which truncate a before vocalic desinences). Leskien merely assigns them to different classes, IB vs. III.1.A. Leskien's classification of prosit as IVA and sidit as IVB missed the fact that the IV feature (i in the present) is predictable from the B feature (ē only in the past). Jakobson's side-, where e truncates in the present, makes the connection. Compare vladej-, in which e is protected from truncation by the stem consonant.

In subsequent single-stem descriptions, Jakobson's unitary full stems were replaced by structures like sid+ē, pis+a, čit+aj, krik+nu, and so on. This complicated their syntax. A simplex side- is handled by a single lexical insertion, but sid+ē is already the result of combining, which must be provided for either in the sentence or in the lexicon. Underlying representations like /sid+ē+i+t/, common in the 1960s, invited the criticism that the only role of ē (however it gets there) is selecting the theme vowel, which then truncates it. The 1sg. sižu was found to be especially troublesome. Starting with the underlying representation /sid+ē+i+ow/, the problem was to get the ē to truncate before i but keep i from truncating before ow (which would result in *sidu) so that it can glide and condition

the iotation of d to ž. Lightner held at one point (1967) that verbs of this class show the operation of truncation rules to be cyclic, but later he reconsidered. In Coats & Lightner 1975 it is proposed that this verb has "an alternating suffix: e in the infinitive and past, i in the present" (340).

Verbs of the pišet/pisal class have been the subject of a wide range of analyses. Jakobson's full stem was pisa-, and the vocalic ending -et truncated the stem vowel and shifted s to š. There were subsequent efforts to pin down the conditions for this shift. Halle 1963 proposed that it occurs when a rounded vowel follows an unrounded one, thus in /pis+a+o+t/ (/o/ because thematic e is realized as [o] under stress). Lightner 1967 proposed that in this environment a shifts to j, so that the change of s to š can be seen as iotation. In Coats & Lightner 1975 the j is recognized as underlying, a part of the verbal suffix aj which occurs also in verbs of the čitajet/čital class. The surface difference between pišet and čitajet is due to the fact that verbs of the former class are "specially marked as undergoing the morphological rule V-drop" (339); thus /pis+aj+e+t/ ↪ V-drop ⟶ pis+j+et ⟶ iotation ⟶ pišet.

As I hope to have shown with this brief survey, Jakobson 1948 by ignoring the theme/root distinction transferred some of the traditional subject matter of morphology, namely, the distribution of verbal themes, to the morphophonemic component of the grammar. After Halle 1959 (pp. 22-24) collapsed the morphophonemic and phonemic levels of representation, verbal themes became subject matter for (generative) phonology. However, with the development of generative phonology it has become increasingly clear that the distribution of verbal themes is not a matter of phonology. Jakobson's part in this calls for two additional comments.

First, it should not be supposed that Jakobson overlooked the distinction between thematic and root elements through inadvertence. It seems he did it deliberately, in order to capture regularities which are not apparent from traditional vantage points. Porot' 'to flog' is a case in point. Historical-comparative grammar teaches that the past stem is athematic and that pleophonic poro- is the regular phonetic development of vowel plus liquid before a consonant: /por+l+a/ ⟶ porola. Porola (fem. past) is thus structured the same as nesla '(she) carried'. Therefore we expect also its present-tense forms to be structured like those of nes- (1sg. nesu) and not be iotated. But they are iotated (1sg. porju), and this makes them irregular. For Jakobson, however, the full stem poro- is structured like pisa-, not like nes-, and the two vocalic stems regularly truncate the stem vowel in the present and iotate the stem consonant (cf. 1sg. pišu).

Second, Jakobson's morphophonemics also accounted for alternations which do not involve thematic elements. Here we may include alternations like l/∅ in nesla/nes 'carried' (fem./masc.), d/∅ in vedet/vel, and m/a in žmet/žal 'squeeze' (3sg./masc. past). These alternations are widely thought to reflect diachronic sound changes which have no synchronic counterpart. In support of this view it is noted that final sl clusters, as in smysl 'sense', are considered pronounceable; -dl- clusters, as in sedlo 'saddle', are not simplified; and most V̈NC combinations (where V̈

is a front vowel) do not shift to aC. But this only shows that the rules
operating in nes, vel, and žal have morphological environments. To deny
that these rules apply is to opt for suppletion, that is, to claim that
nes has no past-tense suffix, that 'lead' has a lexical entry /ve/ in
addition to /ved/, and 'squeeze' a lexical entry /ža/ in addition to
/žm/. (In stating the alternatives so, I overlook the possibility of
so-called allomorphy rules.) Jakobson showed the nonoccurrence of sono-
rant m to be positional before consonantal l and thus pointed the way to
a synchronic description of this alternation. An important stage in its
formulation was Halle 1963, which extended the single-stem approach to
perfective/imperfective alternations (Jakobson had limited himself to
simplex verbs thereby excluding aspect morphology from consideration).
In Jakobson's derivation of žal, underlying /žm+l/ underwent truncation
to žØ+l and then Ø was replaced by a. Following Halle's lead, Lightner
took into account alternations like na-žm-u/na-žim-aju 'I press' (fut./
pres.) and posited underlying /žĭm/. Now the opening of underlying /ĭ/
to a could be taken through the familiar nasal-vowel stages. The more
detailed description of the nasal/vowel alternations in modern Russian
in turn brings out the difference between thematic and root nasals. The
fact that '(he) put' is del, not *djal, shows the n of denet to be
thematic, not root.[5] The same goes for the n of dostignet 'will attain'
(infinitive dostič'), which alternates with zero in dostigla (fem. past),
not with a vowel. Similarly, the fact that the past of pojet 'sings' is
pel (by monophthongization from /poj+l/), not *pol (by truncation), makes
it possible to distinguish this root j from the thematic j of znajet,
which is not reflected in znal.

   Garde 1965, reviewing Halle 1963, pronounces the single-stem
description of the Russian verb a failure. "Regular" verbs like pisal/
pišet may be more numerous than "exceptions" like sosal/soset, he writes,
but both classes are unproductive and in neither is there a phonological
connection between a in the past and iotation in the present. Subsequent
research supports Garde on this last point. Nevertheless, his criticism
overlooks one of Jakobson's major contributions, which was to eliminate
a level of stem-formation from verbal inflection. In traditional descrip-
tions like Leskien's, a lexical /sid/ may be thought of as first undergoing
stem-formation, → sid-i-, and then undergoing inflection, → sid-i-t,
with phonetic rules giving the output, [şiḑít]. In Jakobson's system,
a lexical verb /side/ undergoes inflection directly, → side+it, with
morphophonemic rules giving the output. If it turns out that thematic
elements need to be inserted where they occur rather than truncated where
they don't, the morphophonemic rules will need to be reformulated accord-
ingly. But this will not reinstate stem-formation as a component of
verbal inflection.

   Where no thematic elements are involved, we need not see much
difference between Leskien's description and Jakobson's. For example,
an athematic past-tense form like žal consists of a lexical verb and
an ending; the difference between /žĭm+l/ and the surface representa-
tion is phonological. And yet Leskien's description of the Slavic
verb is historical-comparative, while Jakobson stated his purpose as
"the strictly synchronic formal analysis of the conjugation pattern
in present-day Standard Russian". Garde has an amusing comment on this

point. He approves of Halle's rule relating the thematic $\bar{e}$ of sidel and visel 'hung' to the thematic a of stojal 'stood' and ležal 'lay' (namely, $\bar{e} \rightarrow$ a after a palatal) and notes that it is nothing other than "la projection sur le plan synchronique des lois anciennement connues en phonétique historique". He continues: "Nous arrivons donc à ce dilemme: ou bien les 'règles synchroniques' sont une nouvelle formulation des lois diachroniques, ou bien elles sont fausses" (145). We need not see any dilemma here. As Lightner put it (1967:51), we propose underlying representations and phonological rules in order to account for the linguistic data. Once we relinquish the assumption that synchronic rules can do things that diachronic rules never could, the differences between diachronic and synchronic descriptions are determined solely by the data.

Coats and Lightner allude to "morphological rules" for accounting for the distribution of the verbal themes in sidit, sidel, and pisal, but they call these vowels suffixes and apparently assume roles of stem-formation. What I understand by morphological rules is thematization, a process which intercalates phonetic segments between verbs and endings. In place of the full stem side- or the root-suffix combination sid+$\bar{e}$ I propose a lexical /sid/ specified in the lexicon as +$\bar{e}$/PAST.[6] This lexical feature conditions thematization for $\bar{e}$ in a past-tense structure like [$_V$sid l] and entails thematization for i in a present-tense structure like [$_V$ sid t]. Similarly, in place of pisa- or pis+a I propose a lexical pis with the feature +a/PAST, which conditions thematization for a in the environment [$_V$ pis l] and for je in the environment [$_V$ pis t].

The entailment network among verbal themes makes possible many economies in lexical specifications. As Meillet noted (1934:232), the present theme i is never preceded in a verb form by any other theme. Therefore any verb with a thematic specification other than +i or +$\bar{e}$/PAST automatically takes the 1st-conjugation present theme e[7] (assuming it is not one of the two athematic verbs, 'eat' or 'give'). For example, /ved/ is unmarked in the lexicon except as +Verb (a specification which is needed to distinguish /ved/ from the many nominal items which occur in one of the productive patterns calling for +i thematization, e.g., sledit 'follows' with /sl$\bar{e}$d/ 'trace'); it therefore undergoes thematization for e in the 3sg. form vedet. Further, verbs like /por/ and /zna/, which are marked +j, likewise undergo thematization for e, in addition to thematization for j (porjet, znajet). So also verbs marked +n, like /väd/ 'fade' and /kyd/ 'throw', are thematized for e as well as for n (vjanet, kinet). Verbs with the vocalic theme specifications +a (/čit/), +a/PAST (/pis/), +e (/vlad/), and +ow(/torg/) all undergo thematization for j in present-tense forms, and thematic j entails thematic e (čitajet, pišet, vladejet, torgujet).[8] Finally, the vocalic theme $\bar{u}$ entails a following thematic a (from which it is separated by hiatus-filling v); thematic a in turn entails j and j entails e, as in zapisyvajet 'records'. It should be noted that some of these thematic features, for instance +$\bar{u}$, are productive and are therefore syntactic, not lexical.

Rules that introduce thematic elements into verb forms have support that rules which truncate these elements lack. Thematizations are also

diachronic rules, which means there is always a stage at which they are optional synchronic rules. Consider the present-tense forms in modern Russian with the simplest morphology, the athematic singular forms of 'give' and 'eat'. The 3sg. form of 'eat', underlying [$_V$ ēd t], serves directly as input to the phonology and is realized as <u>est</u>. The plural forms were athematic in Old Russian but are thematic in the modern language. According to Durnovo (1924:330), 2pl. <u>ěste</u> was replaced by <u>ědite</u> in the fourteenth century. Hence for some fourteenth-century speakers underlying 2pl. [$_V$ ēd te] could be realized either with or without thematization. At the same time 3pl. <u>ědjat</u> was reanalyzed from athematic /ēd+nt/ to thematic /ēd+i+nt/ with no surface change.

For a contemporary example consider the alternate 3sg. forms <u>pleščet</u>/<u>pleskajet</u> 'splashes': underlying [$_V$ plesk t] is invariably thematized to [$_V$ plesk je t], and then is either realized, as <u>pleščet</u>, or else further thematized to <u>pleskajet</u>. On the other hand I do not know of any alternate forms like <u>pleščet</u>/*<u>pleskaet</u> or <u>sidit</u>/*<u>sideit</u> (with hiatus between the theme vowels) ever being observed, which would show the truncation of thematic elements to be an optional synchronic rule. In terms of lexical specifications, the account of <u>pleščet</u>/<u>pleskajet</u> being proposed here is quite similar to Coats and Lightner's. Their /plesk/ is marked in the lexicon as undergoing the "morphological rule V-drop" in structures like [$_V$ plesk aj et] and is in the process of losing this specification. I propose that /plesk/ is specified +a/PAST, which excludes thematic a from [$_V$ plesk j et], with the understanding that this specification is in the process of being simplified to +a, so that thematic a is now being introduced also in nonpast environments. In either formulation the lexicon is undergoing simplification. On the other hand a description of this alternation based on truncation rules would show an unproductive stem type pleska- being replaced by a productive stem type pleskaj-. The unchanged past form <u>pleskal</u> now shows truncation (/pleskaj+l/) whereas previously it did not (/pleska+l/), while the new present form <u>pleskajet</u> does not acquire thematic a underlyingly (since it is present both in /pleska+et/, i.e., <u>pleščet</u>, and in /pleskaj+et/) but only the stem-final j which blocks its truncation. In this regard the Coats and Lightner proposal resembles Jakobson's: both forms are represented with underlying thematic a. A thematization approach, on the other hand, posits underlying a and j only in forms where they occur in the surface representation (or are at least reflected there).

So far I have argued for vocalic verbs in Russian on the grounds that n and j in certain verb forms are thematic, not lexical. Let us now consider w. There are three verbs in Russian which precede the present-tense theme vowel with w: <u>živet</u> 'lives', <u>plyvet</u> 'swims', and <u>slyvet</u> 'is famous'. Jakobson explained the absence of w in <u>žil</u>, <u>plyl</u>, and <u>slyl</u> by the rule of sonorant truncation; /žiw+l/, /plyw+l/, and /slyw+l/ underwent this rule the same as /znaj+l/, /stan+l/, and /žm+l/. In the case of the nasals and j there are contrasting forms, noted above, which allow us to distinguish root elements from thematic. For w it is harder to disprove root status because in all three cases it is preceded by a high vowel. Diphthongs beginning with a high vowel in Slavic behave differently from diphthongs beginning with a nonhigh

vowel. For example, 'die' has two ablaut shapes, /mer/ with a nonhigh vowel and /mĭr/ with a high vowel. Before the infinitive ending /ti/ the former develops pleophony (meret'), but before the fem. past ending /l+a/ the latter does not (merla). The acc. sg. marker /m/ combines with a nonhigh theme vowel to give a nasal vowel in OCS ženǫ (= R ženu), but with a high theme vowel in the case of an i-stem noun like 'bone' nasality is not reflected: OCS kostĭ (= R kost'). Therefore we cannot point to kujet 'forges', where /kow/ (cf. past koval) monophthongizes before thematic j, as proof that the unaltered vowels of žil, plyl, and slyl cannot reflect underlying /žiw/, /plyw/, and /slyw/. However, for the latter two verbs there are related forms which show the w of the verb forms to be a present theme. In plovec 'swimmer' (gen. plovca) and preslovutyj 'famed' (cf. also slava 'fame') the roots in question occur before a vocalic suffix and we see that their shapes are /plŭw/ and /slŭw/. (Yers in Russian, that is, ĭ and ŭ, regularly lower following a liquid which is preceded by a nonsyllabic.) In the verb forms ŭw monophthongizes to ū (= y), and this is conditioned by thematic w.

There are also a few verbs where d has an uncertain status, lexical or thematic. 'Rides' is edet but 'rode' is exal. If these forms share a lexical verb it is /ē/ and the lexical representations [$_V$ ē t] and [$_V$ ē l] call for highly specific thematizations. In the case of exal they would not be unique. Russian has a productive pattern in which an interjection occurring in a verbal construction with the meaning 'say ___' undergoes +a thematization and then, unless it ends in a velar, further thematization for k. Thus 'say [ex]' is èxajet/èxal, while 'say [e]' is èkajet/èkal. Of course /ē/ 'ride' is not an interjection. As for edet, another clear case of thematization for d in the present is budet/byl 'be' (infinitive byt'). The handbooks also mention kladet/klal 'lay'; but since there is a trace of a d in the infinitive klast' and the infinitive and past normally show the same thematization, it is likely that the absence of d in klal is due to a cluster simplification, /klad+l/ ⟶ klal, and that the d is lexical.

Another verb with a possible thematic d in the present is 'go', as in projdet 'will go through'; compare inf. projti with no d (past prošel is suppletive). However, there is a rule in Russian which drops the middle member in a coronal cluster (thus the t in lestnyj 'flattering' is silent) and this may account for the absence of d in projti. In the unprefixed idti the d is manifest. The only other candidate for thematic d is 'give' (inf. dat'), which shows d in the plural paradigm dadim, dadite, dadut and indirectly in 3sg. dast. But a thematic specification +d/PRES assigns a verb to the first conjugation, as do all thematic specifications other than +i and +ē/PAST. For /da/, however, only 3pl. dadut shows 1st-conjugation thematization, the rest of the present paradigm being either 2nd conjugation or athematic. This leaves just two verbs, /ē/ and /by/ (actually, /bŭw/; see below), which would be +d/PRES. Should we then drop this feature and posit suppletive verbs, /ēd/ and /ēxa/ for 'ride' and /bud/ and /by/ for 'be'? This would at least satisfy the expectation that a synchronic description should differ from a diachronic description. In diachronic descriptions we find idet and kladet grouped with edet and budet as instances of thematic d. But I do not see why a rule needed for four lexical items should have that much surer a place in our grammar than a rule needed for two.

There are also verbs in which $\bar{e}$ may be either lexical or thematic. Just as /ē/ 'ride' and /Ži/ 'live' turn out to be vocalic verbs if the nonsyllabics following them are thematic, so also are there verbs which turn out not to be vocalic if the vowels following them are thematic. I have in mind these verbs: grejet/grel 'warm', prejet/prel 'molder, stew', smejet/smel 'dare', spejet/spel 'ripen', tlejet/tlel 'decay', and zrejet/zrel 'ripen'. The question is whether 'dare' (for example) is a lexical /smē/ with the thematic specification +j or a lexical /sm/ with the thematic specification +ē (which entails thematic j in the present). For zrejet there exists the jargon verb zorit 'ripens' (trans.), which points to a consonantal lexical verb. For grejet there is also gorit 'burns' (intransitive, however; not the transitive construction seen in meret' 'die' ∿ morit' 'exterminate'). For prejet there is also parit 'steams', but it is not certain that these forms share a lexical entry. For smejet and spejet the main consideration for /smē/ and /spē/ rather than /sm/ and /sp/ is the rarity of asyllabic roots in Russian (only a few pronominal roots like /k/ 'who' and /t/ 'that'). In the case of tlejet we posit a syllabic root (/tŭl/ or /tĭl/) because /tl/ would simplify to /l/. For similar reasons we analyze 'know' as /zna/, not as /zn/ with the thematic feature +a.

That is all that will be said for now about distinguishing themes from root elements. Let us turn to the task of distinguishing between themes and suffixes. The reader may wonder what the difference is between claiming that a verb form is thematized for segment(s) X in environment Y and claiming that it contains suffix X with meaning Y. I assume a suffix is a sound-meaning pairing listed in the lexicon and introduced into the representation of a word form by a lexical rule. Suffixes have syntactic properties and (as a rule) determine the category of the word constituents containing them. Thus godlessness is a noun because it contains the noun suffix -ness. The preceding constituent, godless, is an adjective because it contains the adjective suffix -less. Now freebie is also a noun, because it contains the noun suffix -ie. It too contains an adjective, but what precedes -ie is not an adjective by virtue of -b- but because free is an adjective in the lexicon (unlike God). In freebie, -b- has no recategorizing function; it is merely free's way of preserving its root-suffix structure when followed by -ie. Note that when free is followed by the comparative suffix -er, the bisyllabic structure is maintained with a glide filling the hiatus. Therefore the development of a voiced bilabial stop at the syllable boundary between free- and -ie is an idiosyncratic fact about free. Compare Sue, which develops a voiceless velar stop when it occurs with the hypocoristic suffix -ie: Sukie (which may have to do with the fact that sooey is a hog call).

My view of verb forms in Russian as (P-)V-E structures which undergo thematization entails the claim that no suffixes occur between V and E. Many Slavists believe that verb forms like bel-ej-et 'turns/shows white' contain an inchoative suffix and verb forms like zev-nu-l 'gave a yawn' a semelfactive suffix. I think the meanings of such forms can be accounted for without positing a suffix. Many Slavists also believe that forms like zapis-yvaj-et 'records' contain an imperfective suffix. But thematic y can be shown to be regular when [$_V$ za pis t] occurs imperfectively, and it conditions the appearance of the following themes. Coats and Lightner

speak of a verbal suffix aj and a present-tense suffix e in čitajet and
pišet, but in this article they are more concerned with the input to the
phonology than the output of the syntax. Of the forms just cited,
belejet involves recategorization, since belyj 'white' is an adjective
form. There are also numerous verb forms like obed-aj-et 'dines' which
contain nouns (cf. obed 'dinner'). But I believe that recategorization
is effected in such cases by introducing an adjective or noun at the V
node, that is, by so-called conversion, not by means of suffixes. In
other words, belej- and obedaj- are like freeb-, not like godless. It
is forms like stavšix '(those) who stood' (gen.) that are structured like
godless: the past active participial suffix -vš- marks it as an adjec-
tive stem and determines its selection of adjective endings like -ix.

The line between suffixes and themes is not always as clear as I
believe it is in vstavšix and vstanet. Even an ostensibly monofunctional
element such as the -l in stal on closer inspection does not have a sure
claim to suffix status. What I have been calling the past-tense ending
is not really an ending, as we see when we compare stal with stala '(she)
stood' and stali '(they) stood'. The endings of these forms are masc. -∅,
fem. -a, and plur. -i. If we hold strictly to the axiom that a verb form
consists of a stem and an ending, we must relinquish the claim that stal,
stala, and stali are forms of the verb /sta/. The historical source of
the problem is well known. Old Russian had several past tenses, in-
cluding an aorist, an imperfect, and a perfect which consisted of the
copula /by/ and the so-called resultative (or l-) participle, represented
in the modern language by forms like stal, stala, and stali. The aorist
and imperfect fell into disuse in the premodern period and this left the
perfect, which had in the meanwhile lost the copula, as the sole means
of expressing past tense. However, in the case of many prefix-verb
compounds it retains perfect meaning to this day. Whereas On napisal
pis'mo 'He wrote a letter' may be taken to refer to an action completed
in the past, On ustal 'He's tired' refers to a present state (presumably
resulting from past activities). Moreover, many of the same P-V compounds
occur with -l- also attributively, for example, ustalye deti 'tired children'.
Some of the -l- forms are synonymous with forms containing the productive
participial suffix -vš-; for example, ustarelye idei 'old-fashioned ideas'
is more or less equivalent to ustarevšie idei. /l/ is thus multifunc-
tional and entering it in the lexicon as the past-tense suffix creates
troublesome homophonies with occurrences of this segment in other combina-
tions having similar meaning and distribution.

The same is true of the past passive participle suffixes /n/ and /t/,
for example, in On byl uznan/vzjat 'He was recognized/taken'. If we enter
n and t in the lexicon as passive suffixes, we create a problem with verbal
nouns like znanie 'knowledge' and vzjatie 'capture', which occur also in
contexts where there is no passive meaning. In descriptions of morphology
one often encounters statements that such-and-such form is built on such-
and-such stem, for example, the infinitive pisa-t' is built on the stem
of the past-tense form pisa-l (or vice versa) or the subjunctive sänge
in German is formed from the stem of the past-tense form sang. In the
absence of shared meaning such statements are no more than mnemonic de-
vices. Meillet may have put his finger on it when he wrote (1905:389)
that abstract nouns in -ie are formed on the past passive participle stem

because this form provides a consonant between the verbal theme vowel and
the initial vowel of -ie. He also cites OCS dlĭgotrĭpělie 'patience'
(alternate form of dlĭgotrĭpěnie), where we find the stem of the l-
participle. It could thus be claimed that n, t, and l in these forms are
mere hiatus-fillers. Ivanov (1981:99) compares Common Slavic jadǫ 'I ride'
(=R edu) with Lith. jóju (same meaning) and states that the difference
between the two stem shapes "has to do with the fact that -d- became a
morphological means for eliminating hiatus, functionally similar to -j-".

It is not clear what Ivanov means by this, but perhaps we can agree
that the easier it is to account for a word segment phonologically, the
harder it is to regard it as a lexical entry. At the other extreme con-
sider the /tel/ in vmešatel'stvo 'interference', which lacks the '-er'
meaning seen in 'pisatel' 'writer' and thus is merely a filler between
vmeša- 'interfere' and the abstract noun suffix -stv-. I find it hard to
imagine a series of rules intercalating l, e, and t, between vmeša- and
-stv- and so am inclined to the view that this word contains the agent
suffix /tel/, which, however, undergoes semantic depletion here. By the
same token, a hiatus-filling rule which accounts for just one segment is
easy to justify phonologically. We should first ask how the verb form
in question would surface if no rule applied and the hiatus went unfilled.
Take èkal '(he) said [e]', where as noted above a productive rule inserts
[k] between the vowel-final interjection and thematic a (cf. ikal '(he)
said [i]', okal '(he) said [o]', and so on). To formulate this rule, as
is commonly done, $\emptyset \longrightarrow$ (column of phonetic specifications) in such-and-
such environment strikes me as a distortion. What we have between root
/e/ and thematic a is not really $\emptyset$. At very least we have the specifica-
tion -syllabic. If we are right in assuming also -voice, that is, that
phonation is interrupted between /e/ and a, then we have a glottal stop,
an articulatory gesture with specific feature specifications, some of
which are shared with [k] (+back, -continuant, and others). Thus accoun-
ting for the x in exal 'rode' will take fewer feature changes than
accounting for the d in edet 'rides'. This is speculative, however,
because I do not know whether in the unmarked case we should assume an
interruption of phonation or not. In any event, our concern in this
paper is with gliding, so let us concentrate on verb forms in which the
verb-final vowel is not followed by a break in phonation or a consonantal
obstruction. This means forms like uznaj 'find out!' and uznav 'having
found out', rather than forms like uznal '(he) found out', uznan '(he)
was recognized', or vzjat '(he) was taken'. Let us consider v first.

Participial forms like vstavšix '(those) who got up' raise a
question that is central to this paper: is the v lexical, or is it in-
serted? The latter possibility is suggested by participial forms which
show š but no v, for example, prišedšix 'who came', padšix 'who fell',
umeršix 'who died'. In the v-less forms just cited there is reason to
believe that the suffix is not simply /š/. If it were, we would expect
the d in two of these forms to drop, as it does in daš' 'you will give',
which we set up as /dad+š/ on the basis of 3sg. dast, 1pl. dadim, 2pl.
dadite, and 3pl. dadut. Therefore in the participle suffix we posit a
high lax vowel (yer): /ǔš/. Yers lower to mid vowels when followed in
the next syllable of the word by another yer, otherwise they drop
(Lightner 1972:38-41). Yer-drop follows cluster simplification (that
is, early cluster simplification as seen in daš' and vel '(he) led' from

/ved+l/; there are later cluster simplifications, ordered after yer-drop, such as account for the silent t in lestnyj 'flattering' from /lĭst+ĭn-/), and thus padšix surfaces with -dš- but daš' does not. Verbs containing yers show yer-lowering before /ǔš/ as expected. 'Go' is /šĭd/, as shown by the alternation šel/šla 'went' (masc./fem.), hence prišedšix from /-šĭd+ǔš-/. 'Sleep' is /sŭp/, as in spit 'sleeps', usypajet 'falls asleep', and usnet večnym snom 'will sleep the eternal sleep', and the archaic usopšij 'the deceased' shows the yer lowered before /ǔš/. ('Die' is /mĭr/, as seen in u-mr-et/u-mir-ajet 'will die/is dying', but since a yer followed by a liquid lowers in any closed syllable, for example also in fem.past umerla, umeršix could reflect /š/ as easily as /ǔš/.)

Could /ǔš/ be the suffix also in vstavšix? Underlying /-sta+ǔš-/ could show gliding in the high vowel in the environment after the non-high vowel, ⟶ sta+wš, and then the glide could become consonantal, ⟶ -stavš-. The gliding rule is quite plausible for Russian, where piano is often bisyllabic and Duajt Ēzenxauer is a workable spelling for Dwight Eisenhower. Moreover, there is ample evidence that v in Russian is underlyingly /w/. But the second step of the derivation is doubtful. A glide in a closed syllable with a nonhigh vowel normally monophthongizes with it. Thus /krik+now+l+a/ '(she) shouted' is kriknula, not *kriknovla. So the -vš- of vstavšix does not derive directly from /ǔš/ for the reason that it cannot derive from wš. For w to surface as a consonant it needs to be followed by a vowel, as in /kow+a+l+a/ '(she) forged' kovala. Therefore we would posit /wǔš/. But how would /wǔš/ relate to /ǔš/? Is it not the same suffix, which picks up a prothetic glide in the environment after a vowel?

For discussing the suffix of vstavšix it is useful to consider also vstav and vstavši. This is the so-called past gerund, used in subordinate predicates like Vstav(ši) v sem' časov, Saša vyšel iz domu 'Rising at seven, Alex left the house'. The -ši form is colloquial and optional except when followed by the clitic -s', as in zaperšis' 'having locked up'. Since š in the past gerund occurs only when followed by -i, we may set up a single lexical representation for the suffix in vstav and vstavši and assume a rule which drops š before a word boundary. It is not at all clear how the -∅ of vstav and the -i of vstavši relate to the syntactic use of these forms, but by making these assumptions we are able to posit the same suffix in the past gerund as in the past active participle, including also zaperšis' and prišedšix. The advantage of this is that it provides a broader data base for studying the relationship of -vš- (including -v) to -š-.

The distribution is basically -vš- after a vowel (whether a root vowel as in vstavšix or a thematic vowel as in skazavšix 'who said', sidevšix 'who sat', and prosivšix 'who requested'), -š- after a consonant. Verbs not followed by a thematic vowel are a closed class in Slavic, and the limited distribution of -š- must be a factor in its gradual retreat before -vš-, a trend that goes back to Common Slavic. With verbs ending in an obstruent, -š- is holding its own, at least in participles. We find skrebšix 'who scraped', zametšix 'who swept', privezšix 'who brought', pekšix 'who baked', and so on. (In the past gerund -š- is being replaced by -a, as in privezja 'having brought'

next to archaic privezši.) With verbs in d -š- is yielding to -vš-; thus
pavšix 'who fell', kravšix 'who stole', and klavšix 'who laid' are re-
placing or have replaced padšix, kradšix, kladšix. Verbs in t are not
immune to this trend, since substandard priobrevšix 'who discovered' now
competes with standard priobretšix. With verbs ending in a sonorant
consonant, -vš- is predominant. Until late premodern times nasal verbs
like voz'met/vzjal 'take' and načnet/načal 'begin' showed participial
forms like vzemšix and načenšix (from /-ĭm+ŭš-/, /-čĭn+ŭš-/), but now we
find only vzjavšix, načavšix. The unique verb /poj/ 'sing' has never
directly reflected /ŭš/, since the participle is pevšix, not *pojšix.
Similarly with /plŭw/ 'swim' and /slŭw/ 'be famous': the forms are
plyvšix and slyvšix, not *plovšix and *slovšix. Liquid verbs like poret/
porol 'flog' and kolet/kolol 'stab' show only -vš-, thus porovšix,
kolovšix. But liquid verbs with ablaut show a different pattern. -š-
holds its own in participles like umeršix and gerunds with -s' like
zaperšis', while innovative occurrences of -v are seen in umerev 'having
died', zaperev 'having locked', and others.

It would be tempting to regard the replacement of načenšix by
načavšix and padšix by pavšix as a switch from /ŭš/ to /wŭš/ and the
change in verb shape as a consequence of the innovating suffix's phono-
logical structure. If /čĭn/ surfaces as -ča- before t in načat' and
načat 'begun' and before l in past forms, it may be possible to state
this environment so as to include w (even though the other glide, j, does
not condition the shift of VN to a, for example in počinennyj 'mended'
from /-čĭn+j+en-/ and in zemlja 'earth' from /zem+j+a/). And if d drops
before l in the past-tense forms pal, pala, and so on (although not
quite before t in the infinitive past'), perhaps it can be said to drop
also before w (but note unsimplified -dv- in medved' 'bear'). Even if
the phonology could be made to work, we would be left with the task of
stating the distribution of /wŭš/ vis-à-vis /ŭš/ with consonantal verbs.
/čĭn/, /kol/, /pad/ (normally) and /obret/ (sometimes) select /wŭš/,
while /šĭd/, /nes/, /pek/, and /mĭr/ select /ŭš/. Consonantal verbs
which are athematic in the past are a closed class, so this approach is
feasible. But it seems a generalization is being missed, namely, that
the verbs selecting /wŭš/ are the ones which are vocalic on the surface.

The handbooks state that the past active participle and past gerund
are formed on the past-tense stem. In the productive verb classes,
where past-tense forms are thematic, it is shared thematization that
gives, for example, skazavšix 'who said' and skazali '(they) said' a
shared stem shape differing from the present stem of skažet 'will say'
and skaži 'say!'. But in consonantal verbs that are athematic in the
past, the past stem differs from the present stem phonologically. Now,
if the realization of /čĭn/ as -ča- in načavšix (rather than as -čn- as
in načnet) is not conditioned by underlying /wŭš/, it must be conditioned
grammatically, by the +PAST feature shared by načavšix and načal. I am
not sure what this means for our analysis of forms like načal, načat',
and načat, in which /čĭn/ is realized as -ča- before a nonsyllabic which
we know is there underlyingly. In any event, if our hunch is correct that
the shift of /čĭn/ to -ča- in the past active participle may be con-
ditioned grammatically, we are left with a single underlying representa-
tion of this suffix, /ŭš/, and the v occurring before it is a hiatus-filler.

The issue is not limited to verbs that are athematic in the past.
Verbs with the thematic feature +n, like kriknet 'will shout', are
thematized for ow in the past,[9] and /krik+n+ow-/ presents another
problematic stem shape for the past active participle and past gerund.
If this nonsyllabic stem were followed by the syllabic suffix /ŭš/, as
we would expect on the basis of prišedšix and stavšix, we would get
*kriknovšix rather than the observed kriknuvšix. Hence either stems
in n+ow select the suffix /wŭš/ (before which they monophthongize) or
the monophthongization of n+ow is grammatically conditioned and the v
that follows is prothetic to /ŭš/.

Perspective on this problem is provided by another set of parti-
cipial forms, where the roles of syllabic and nonsyllabic suffixes are
reversed. The past passive participle has three suffixal shapes, /t/,
/n/, and /en/, and some verbs occur with both /t/ and /en/. Thus otkryt'
'to open' has the past passive participle otkrytyj, but there also exists
the related adjective otkrovennyj 'frank, outspoken'. Further, zabyt'
'to forget' has the past passive participle zabytyj but also the archaic
synonym zabvennyj. To account for these alternants we posit /krŭw/ and
/bŭw/. Before /en/ the glide is realized as v, with the yer lowering in
the first case and dropping in the second. Before /t/ the diphthong ŭw
monophthongizes to ū, which is realized as y. The past active participles
of these verbs are otkryvšix and zabyvšix. Here again we may claim that
-vš- is yet another nonsyllabic environment for the monophthongization of
the root diphthong. But the nonmonophthongized -krov- and -bv- is so
limited (many would say it has lost its synchronic connection with -kry-
and -by-) that its appearing in monophthongized form also in the past
active participle is weak evidence for the consonant-initial shape of
that suffix. So here too a case can be made for an intermediate kry+ŭš
and by+ŭš acquiring a prothetic glide, ⟶ kry+wŭš, by+wŭš, by a
phonologically motivated rule of hiatus-filling. This applies also to
a few instances of thematic ow after thematic n, for example, vdoxnut'
'to inspire' and vdoxnovennyj 'inspired'. Here the nonsyllabic
/vŭ+dŭx+n+ow-/ selects the syllabic en suffix, but it cannot be said to
directly select the syllabic ŭš suffix because verbs in -nut' all have
past active participles in -nuvšix. The latter are poor evidence for
underlying /wŭš/, as the monophthongization of ow after n is to a large
extent lexicalized.

Before leaving past active participles, it may be useful to con-
sider these forms in Old Church Slavonic. They are quite similar to
those in Russian except in the case of thematic i. Corresponding to R
prosivšij '(he) who requested' we find the similarly structured OCS
prosivŭši '(she) who requested' but also the conservative variant prosîši.
The two forms may be said to share the underlying representation /pros+i+ŭš+i/.
The younger form shows v between the theme vowel and the suffix vowel, but
in the shorter form i has glided and fused with the root consonant (si ⟶
sj ⟶ š) fronting suffixal ŭ to ĭ in the process. The question is this:
does thematic i in the younger form fail to glide because it is separated
from the suffixal vowel by a glide, or are the two vowels separated by v
because the first has failed to glide? I think the latter: the tendency
to reduce allomorphy is the cause and hiatus-filling v the effect, not
vice versa. We see something similar in Russian in the handful of cases

like zatmit 'darkens'. This compound verb, like others with thematic i, acquires thematic a in imperfective use. The regular development is for i to glide before a and iotate the root consonant, for example, utom-i-t 'will tire out'∽ utom-lja-jet 'tires out' (j after a labial in Russian is realized as [ʎ]). In the case of zatmit the gliding of i in tm+i+a would result in a difficult *zatmljajet. So gliding is blocked and the i (spelled e) remains syllabic and ends up separated from thematic a by a glide: zatmevajet. So also prodlit 'will extend'∽ prodlevajet 'extends'. For another example of a phonological rule apparently being blocked in anticipation of a difficult output, consider the verb /tŭk/ 'weave'. Comparable verbs like /pek/ 'bake' take thematic e in present-tense forms and undergo palatalization, thus pečet 'bakes'. But 'weaves' is tket without palatalization, a unique exception. This must have to do with the asyllabic surface shape of the verb and the fact that palatalization would cause rather extreme allomorphy, tkal in the past but *tčet, pronounced [ʧ:ot], in the present.[10]

I turn now to imperfective verb compounds in -at', which in the case of vocalic verbs invariably end in -vat', for example, pomog-at' 'to help' but ubi-vat' 'to kill'. Regardless whether we regard -a- as an imperfective suffix or as a thematic vowel, the -a-/-va- alternation poses the same question as the -š-/-vš- alternation in the past active participle, namely, is the prothetic glide predictable from the phonological environment, or are there features of the phonological environment which can only be accounted for in terms of an independently selected /wa/? It seems there is only one verb, /poj/ 'sing', which could support the latter option. Every other verb that shows a consonantal/vocalic stem alternation conditioned by a vocalic/consonantal ending alternation, for example, načn-et/ nača-1, shows the consonantal shape in the imperfective, thus način-al '(he) was beginning'. Only 'sing', which is consonantal in zapoj-et 'will begin singing' and vocalic in zape-1 'began singing', is not consonantal in the imperfective (*zapoj-al) but vocalic: zape-val. (By consonantal I mean nonsyllabic.) Hence the question: has /poj/ monophthongized before /wa/ the same as before other nonsyllabic endings, or is the monophthongization of /poj/ nonphonological here, with w introduced as a hiatus-filler? I choose the latter so as not to be left with an imperfective suffix (or a nonphonological thematization) which occurs with only one verb.

There are imperfective verb forms in -va- where v is a root element. Thus the v of sryvajet 'tears off' is found also in pfv. sorvet and sorval. This case is clear, but there are others, such as otkryval 'would open' and zabyval 'would forget', which are less so. We have noted evidence (forms like za-bv-ennyj and ot-krov-ennyj) that these verbs should be represented as /bŭw/ and /krŭw/. Zabyval could then represent /bŭw+a/ with the root vowel lengthened to ū (=y) in the imperfective, as can be observed also in na-čin-al (cf. na-čn-et), na-žim-al (cf. na-žm-et), s-ryv-al (cf. so-rv-et), and so on. Or zabyval could show bŭw monophthongized in a nonphonological environment, /bŭw+a/ → bū+a, with -v- reflecting a hiatus-breaking glide. Meillet (1934:303) cites the contrasting stress in pfv. zabýla 'she forgot' and impfv. zabyvála as evidence of two different y's, a monophthongized ŭw in the first case and a lengthened ŭ in the second. This would make the -v- which follows a root element. This root /w/, he proposes, is

the historical source of the prothetic v occurring in zapeval, ubival, vstaval, and so forth. But the speakers who first started inserting hiatus-breaking /w/ in /pe+a/, /bi+a/, /sta+a/, and so on must have already reanalyzed /bŭw+a/ as bū+a. Only this assumption would explain why the prothetic element is w and not one of the other root-final segments which precedes /a/ in prefixed imperfectives (nači-n-al, naži-m-al, prika-s-alsja, zape-k-al, etc.). Thus the structural ambiguity (accent aside) of zabyval and otkryval is irrelevant for our account of the -v- in the imperfective forms of prefixed vocalic verbs generally.

We thus have (aside from the three verbs that show w as a present theme) two grammatical environments in which a vocalic verb acquires a hiatus-breaking back glide: before the participle suffix /ŭš/ and before the imperfective theme vowel /a/. The question arises, as it did for consonantal hiatus-breakers, which of the required feature specifications come so to speak free, given by the syllabic structure of the verb form in question, and which need to be specified by a thematization rule? If we may assume that phonation is not interrupted, then -syllabic and +sonorant come free and a glide is already specified. After a verb ending in a rounded vowel, for example obu-v-al 'was shoeing', it could be claimed that the glide is phonetically determined. But the same glide occurs also following a high unrounded vowel, as in ubi-v-al 'was killing', and since the glide which is homorganic with /a/ is /h/, we need a rule to specify the glide in this case both -low and +back.

Let us consider the front glide now. It is demonstrably a root element in /poj/ 'sing', where it is needed to account for the monophthongized vowel nucleus of pel, pevšix, zapevat', and so on. Adherents of the single-stem analysis posit a root j in another two dozen cases (Flier 1974), for example, in bil 'beat', kryl 'covered', and obul 'shoed', where it is said to undergo truncation before a consonantal ending. In cases where the putative root j is preceded by a high vowel (cf. the proposed /žiw/ for žil), it cannot be dismissed on the grounds that monophthongization would yield a different vowel nucleus. This objection is valid, however, in certain cases involving nonhigh vowels. Thus the j of sejet 'sows' cannot be a root element because /sej/ before -mja would monophthongize to *simja, while 'seed' is semja; the j of smejetsja 'laughs' is not a root element because 'laughter' is smex, not *smix; and the j of vejet 'blows' is not a root element because 'wind' is veter, not *viter.

In 1970 several Slavists independently (Flier 1974:15) proposed a rule of Glide Shift, which was said to relate, for example, the j of ub'jet 'will kill' to the v of ubivajet 'kills'. The rule was an instant success,[11] and j came to be posited even in verbs where it is always realized as v. Thus /j/ is Flier's lexical representation for the v of zastrevajet 'gets stuck' and zabyvajet 'forgets', even though the corresponding perfective forms are zastrja-n-et and zabu-d-et. (In these forms /j/ is said to undergo truncation before a consonant.)

Lightner 1968 assumes that j is a root element in b'jet and the other verbs of this class because of ablaut nominalizations like uboj 'slaughter', which are claimed to be regular for verb roots ending in

a sonorant. Consider also <u>sobor</u> 'cathedral' next to <u>sober-et</u> 'will gather' and <u>zov</u> 'a call' next to <u>zval</u> 'called' (/zŭw+a+l/). What facts like <u>uboj</u> and <u>zapoj</u> 'binge' (cf. <u>zap'jet</u> 'will start drinking') show is, first, that noun forms present additional environments for thematization (for /sta/ we find also <u>stav</u> 'brace', <u>stan</u> 'camp', and <u>staja</u> 'flock, pack'), and, second, that e ∿ o, as in <u>tek-ut</u> 'flow' ∿ <u>tok</u> 'current', is not the only ablaut pattern. Besides, in the case of 'live' (<u>živet</u>) with its putative lexical w, the ablaut nominalization shows j, as for example in the historical term <u>izgoj</u> 'outcast'.

With a high vowel, a present-tense j is demonstrably not lexical only in the few cases where the lexical item in question occurs also prevocalically. In <u>šil</u> 'sewed' we have a verb which for the most part patterns like 'beat'. But <u>šveja</u> 'seamstress' and <u>šov</u> 'seam' (gen. <u>šva</u>) show this lexical item followed by vocalic suffixes and we see that it is not /šij/ or /ši/ but /šŭw/ (or /sjŭw/). So also the alternate root shapes in <u>otkrovennyj</u> 'frank, open', <u>omovenie</u> 'cleansing', and <u>nadmennyj</u> 'haughty' (cf. <u>nadutyj</u> 'haughty' and <u>nadujetsja</u> 'will become haughty') testify against lexical /kryj/, /myj/, and /duj/ (or /krū/, /mū/, and /dow/) in favor of /krŭw/, /mŭw/, and /dŭm/.

If j in these present-tense forms is not a root element, it must be provided for. It was proposed earlier that /zna/ 'know' and /por/ 'flog' share the lexical feature +j/PRES. This should be reconsidered. There is a sizable class of consonantal verbs which do not show j in the present--/ber/ 'take', /nes/ 'carry', and so on--and therefore specifying /por/ +j/PRES is necessary. But the j of <u>znajet</u> may be regarded as a hiatus-filler, a consequence of the fact that the verb is vocalic and has no other thematic specification (cf. <u>stanet</u>, <u>edet</u>, <u>plyvet</u>). Perhaps it can go unmarked in the lexicon (other than for the +Verb feature which assigns it to the 1st conjugation). This may be proposed also for /bi/ 'beat', /li/ 'pour', /nū/ 'ache', and others of this class. As for the verbs of this class for which there is evidence of a root in /ŭw/, that is, <u>šil</u>, <u>kryl</u>, and <u>myl</u> 'washed', these may be included in the unmarked j class because Russian has no verbs like OCS <u>plovetŭ/plulŭ</u> 'swim', in which a root w is directly followed by the present-tense theme vowel. Hence the occurrence of j in present-tense forms of /šŭw/, /krŭw/, and /mŭw/ (also /bow/ 'shoe') may be regarded as regular. This analysis applies also to <u>dujet/dul</u> 'blow' with lexical /dŭm/; there would be no advantage in lexically specifying a thematic j because VN does not monophthongize before j (as noted above, /zem+j+a/ is <u>zemlja</u> 'land', not *<u>zjaja</u>). The monophthongization of /dŭm/ in <u>dujet</u>--although not necessarily in <u>dul</u>--is lexically specified, and j is a hiatus-filler, as in <u>znajet</u>.

For verbs in which a root w is followed by the past-tense theme a, for example, <u>soval/sujet</u> 'shove' and <u>pleval/pljujet</u> 'spit', the thematic specification +a/PAST provides for a present theme j. Against this background <u>čujet</u> 'senses' is problematic, because in the past we find <u>čujal</u>, not *<u>čeval</u>. This form raises the question whether there are verbs which must be specified +j/PAST in order to provide for a thematic j which conditions monophthongization in past forms as it does in present forms like <u>sujet</u>. I think not. For verbs like <u>lajet/lajal</u> 'bark',

sejet/sejal 'sow', and smejetsja/smejalsja 'laugh', a +a/PAST specifica-
tion will suffice, once we assume that j is the unmarked hiatus-filler
before vowels other than the imperfective theme a. Thus, while im-
perfective zaseval 'was sowing' shows v before the imperfective theme
a, perfective zasejal 'sowed' and imperfective sejal both show j before
the past theme a. The case for j as the unmarked hiatus-filler could
draw additional support from the few +a verbs like zijajet/zijal 'yawn'
and vajajet/vajal 'sculpt', if we analyzed them as /zi/ and /va/ (how-
ever, there is no good reason for not regarding the j here as lexical,
thus /zij/ and /vaj/). I conclude that monophthongization in /čew/ is
lexical and that the j in čujal is a hiatus-filler (cf. rasčuxal 'sniffed
out' with a different hiatus-filler).

There are two other occurrences of j to be accounted for. First,
a j occurs before the suffix /en/ in the bookish form ubiennyj 'killed'
(cf. unmarked ubityj) and in gnienie 'decay'. It arises here purely
phonetically and no thematization rule is needed. Next, there are a
few cases of j before the imperfective theme a. For example, the regular
imperfective of vol'jet 'will pour in' is vli-v-ajet, but there is also
the bookish form vli-j-ajet 'influences'. A broader consideration of
bookish (Church Slavic) usage turns up also other cases of j where our
rule predicts v, for example, vozda-j-anie 'recompense' with /da/ 'give'.
Apparently we need to posit other, specifically Church Slavic, hiatus-
filling rules. Compare also literary (i.e., Church Slavic) ubijca
'murderer' with slang ubivec with contrasting glides before the same
/ĭc/ suffix.

It has been proposed that krojet 'covers' and dujet 'blows' are
underlyingly /krŭw+e+t/ and /dŭm+e+t/ and that these representations
do not surface as *krovet[12] and *dmet because the roots are "lexically
specified" for monophthongization, thereby creating a hiatus that is
filled by j. The reader may ask if this is not tantamount to admitting
/kry/ and /du/ (with or without j) as lexical representations, to which
the /krŭw/ and /dŭm/ of otkrovennyj and nadmennyj are related, if at all,
by "allomorphy rules", not phonologically. To this I would respond that
all phonological rules are allomorphy rules in the sense they all seek
to account for allomorphy. The greater the allomorphy to be accounted
for, the more abstract the underlying representations and--in some cases,
it seems--the more ad hoc the rule environments. We may counter this
trend by ignoring some instances of allomorphy. Flier writes (1974:30):
"It is unlikely that speakers of [modern Russian] recognize any straight-
forward association between DUT' and its derivatives, and the historical
relics like NADMENN[yj]". Indeed, nadmennyj gives information about
the root of dut', nadutyj, etc. which we would not have if we were
ignorant of nadmennyj. But I question the practice of simplifying the
phonology by feigning ignorance of the facts. Lightner was staunchly
opposed. He believed "we are still in the data-gathering stage" in
linguistics (1975:635). He once asked (unpublished) how we should
represent the alternation of sto-, as in stoit 'stands', and sta-, as in
stal, vstajet, etc., having in mind the proposal that sto- reflects an
earlier *stH$_o$, where H represents a sort of schwa and the subscript
rounding. We have it on the authority of Watkins (1965) that there is
little data to be gathered in Slavic regarding these schwas. In this
case we are genuinely ignorant. Sto- and sta- are clearly related, but
for an isolated fact there is no possibility of a systematic explanation.

NOTES

[1]The V slot may be filled by other than a lexical verb, in cases of so-called conversion.

[2]Underlined forms are in the standard transliteration, with one exception: thematic j is spelled j even though the standard transliteration following Russian orthography represents /je/ as simply e. Hyphens are written in some cases to facilitate focus on morphological elements.

[3]Flier (1974:15) suggests that the w of ow and the present theme j are related by the rule of Glide Shift (see below) but does not elaborate.

[4]That thematic i glides before a vowel and conditions iotation in the verb-final consonant, thus /sid+i+ow/ → sid+j+ow → sižu, is widely accepted. See, for example, Flier 1972:242.

[5]This is noted in Halle 1972:184, where it is proposed to limit sonorant truncation to nonconsonantal sonorants. That the infinitive is det', not *djat', Halle proposes to explain "by adding a special subcase to the rule that deletes the suffix -nu- in certain forms" (p. 185).

[6]In view of sjadet 'will sit down', sadit 'seats', and other facts, this thematic feature may turn out to be syntactic, not lexical, despite its unproductivity.

[7]In the 1sg. and 3pl. forms the present theme is o.

[8]Garde 1972 claims that j is an automatic hiatus-filler in a number of morphological environments including this one. I propose below that this is true of post-verbal j in znajet 'knows', b'jet 'beats', and so on, and so it must also be true of post-thematic j in these cases. See also note 11.

[9]There is no evidence in Russian of the nasalization of ow after thematic n which is proposed by Meillet (1934:61).

[10]Commenting on this form Lightner proposes "that velars shift to palatals before front vowels and j unless this palatalization leads to untenable phonetic representations"(on page 440 of the volume containing Flier 1972 and Garde 1972; emphasis original).

[11]Accepted by Halle (1972:185) but not by Garde (1972). Garde proposes j as a hiatus filler in a range of morphological environments including geroj (gen. geroja) 'hero', tramvaj (gen. tramvaja) 'streetcar', and so on, which would be lexically /gero/, /tramva/, and so on. Flier in his published comments (p. 258) argues that vocalic roots are not admitted by "the grammatical psychology of the Russian speaker-hearer", as shown by the fact that foreign metro is not naturalized as *metroj (gen. *metroja). Garde's j-less analysis of geroj and tramvaj is not supported by any occurrences of these items without j.

[12]The o of *krojet* is different from the o of *otkrovennyj*. The latter is a strong yer, while the former is derived from intermediate kryj+e+t by a rule which laxes high tense unrounded vowels before j and also lowers them; cf. *brejet* 'shaves' next to *bril* 'shaved'.

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REMARKS ON THE SCIENTIFIC REVOLUTION IN LINGUISTICS 1926-1929[*]

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I begin by describing the methods of
main stream linguistics as it was
practised during the nineteenth and
first quarter of the twentieth
century. These methods were
directed toward one primary aim:
the reconstruction of the historical
evolution of a group of languages
from a hypothesized proto-language,
most particularly of the Indo-
European group of languages.
I then discuss in some detail how
Jakobson proposed to change this
methodology and why. I conclude by
noting that a large fraction of
Jakobson's proposals have been all
but ignored by linguists, including
Jakobson himself, and I suggest
that the reason for this was that
partly in response to Jakobson's
criticisms, main stream linguistics
shifted its focus abruptly, away
from concern with the evolution of
languages to the study of each
language as a functioning system.
As a result many of the problems
addressed by Jakobson in 1929 are
unresolved to this day and may well
provide the impetus for the next
revolution in the science of
language.

In what follows I have attempted to retell a piece of the
intellectual history of twentieth century phonology as it emerges from
the correspondence between Trubetzkoy and Jakobson. Trubetzkoy and
Jakobson are justly regarded as the founders of modern phonology, for it
was their work that was one of the major causes of the change in the
focus of linguistic research that took place in the 1930's. Whereas
before that time the central problem of mainstream linguistics was sound
change, after the 1930's the focus shifted to the study of each language
as a self-contained system functioning at a particular point in time in
substantial disregard of its past evolution. It is of some interest to
note that this shift in focus, which is typical of what the philosopher
T. Kuhn has called a scientific revolution, was not among the aims
consciously pursued by Jakobson and Trubetzkoy during the 1920's. They

saw their work rather as a contribution to mainstream linguistics as it was practised at the time. They had discovered that the phoneme system of a language establishes strict limitations on the kind of sound change that the language can undergo and they quite naturally wanted to explore as many ramifications as possible of their discovery. This intention led them to study the phoneme systems of different languages in great detail, and this study proved more difficult and also much more rewarding than they had originally suspected. We recall that at that time very little was known about phoneme systems, and even the idea that the set of phonemes of a language might possess properties beyond those of belonging to a common list seemed extraordinarily daring if not mystical and absurd to a great many linguists. It was thus necessary to demonstrate the linguistic reality of the system of phonemes of different languages.

Jakobson and Trubetzkoy approached this task as follows. They gathered information on the sets of phonemes of different languages and they showed that each of these sets possessed properties above and beyond those of belonging to a common list. Quite naturally a large part of these studies involved phonological problems of a non-diachronic kind, problems that had nothing to do with the historical evolution of the language. Examples of this type of study are Trubetzkoy's paper on vowel systems in the first volume of Travaux du Cercle linguistique de Prague, (1929), his "Essai d'une théorie des opposition phonologiques" published in 1936 and finally his masterpiece Grundzuege der Phonologie published in 1939. In the 1930's Jakobson too worked on synchronic problems. He wrote in this period his important paper on the phonologic function of the accent (TCLP, 4, 1931), his studies on linguistic alliances (German phonologiache Sprachbuende), and his article on the phonology of Slovak. However, it is noteworthy that in this period much, if not most, of Jakobson's work is devoted to diachronic issues to the old problems of phonetic change. Most important among these studies is his article on the principles of historical phonology (TCLP, 4, 1931) and his book Remarques sur l'evolution phonologique du russe moderne comparée à celle des autres langues slaves (TCLP, 2, 1929). The latter, which is examined in some detail below, is a defense and detailed illustration of his profoundly original conception of phonological evolution.

Jakobson's conception of phonological evolution has yet to exercise a major influence on linguistic research, in spite of its great intrinsic interest and potential. The reasons for this are varied. Most important among these no doubt is the fact that Remarques is a difficult book. It requires of its readers both extensive background knowledge as well as intellectual flexibility of a sort that would permit them to see well known phenomena in a new light. It is thus hardly surprising -- though much to be regretted -- that none of the contemporary reviews of the book -- with the possible exception of that by Polivanov -- demonstrated any real understanding of its contents. The difficulties are no less formidable today. Though the theoretical ideas in the book will be much less of a barrier to understanding today than they were half a century ago, the book presupposes familiarity with facts and views that very few linguists trained in the last decade are

likely to possess. If Remarques is to exercise any influence on modern linguistic research, it is necessary that there be an introduction to its ideas accessible to a modern reader. It is my hope that what follows will provide such an introduction at least for a few linguists and that it will lead them to explore further ideas that were abandoned many years ago.

At the end of the eighteenth century Sir William Jones, a high official in the British civil service in India, observed that the phonetic parallels among cognate words in Sanskrit, Greek, Latin and a number of other languages were of such extraordinary regularity that they could not have arisen by chance coincidence and that the only plausible explanation for these parallels was that all these languages, spoken in widely separate geographic areas, descended from a single language which may have become extinct long ago. During the first quarter of the nineteenth century Rask, Grimm and Bopp spelled out essential features of this descent from a common source and established the paradigm that dominated linguistics during the nineteenth century and the first third of the twentieth century. A central feature of the paradigm was the cataloging of correspondences such as those illustrated in (1):

(1) Latin   Greek   Germ.   Baltic   Sanskrit

     ped-   pod-   fot-   ped-   pad-   "foot"

     tres   tri   θre   tri-   tray-   "three"

     kan-   kun-   hund-   sun-   šwan-   "dog"

i.e., the gathering of the evidence showing that there were large numbers of words in each of these languages illustrating the same phonetic regularity. We note parenthetically that the exact characterization of the regularity exemplified is not always trivial. Curiously, little attention was devoted to this issue. In the present instance the correspondences among the word initial consonants are quite straightforward. They are those in (2):

(2) Latin   Greek   Germ.   Baltic   Sanskrit

     p   p   f   p   p

     t   t   θ   t   t

     k   k   h (x)   s   š

Since it was assumed that these correspondences arose as the result of distinct developments from a common source, it was necessary to go one step further and identify the consonant in the source or proto-language as well as state the changes, if any, that this sound underwent in the course of evolution of the different daughter languages. The situation

is almost trivially simple in the first line of (2). As in all science, it has always been assumed in linguistics, though rarely explicitly noted, that in the absence of contrary evidence descriptive simplicity is the basis on which a choice among alternative accounts is made. It was, therefore, postulated that with respect to the facts in the top line of (2) Latin, Greek, Baltic and Sanskrit reflect unchanged the status of the proto-language, whereas Germanic is the result of an innovation, a change expressed formally in a statement such as (3a):

(3a)   IE /p/   ---> Germ. /f/

The data in the second line of (2) confirm this solution further because we find once again that Germanic is the "odd man out"; it appears to have undergone the change (3b):

(3b)   IE /t/   ---> Germ. /θ/

The data in the third line of (2) are somewhat more complex, for here there is agreement only between Latin and Greek. If the complexity of an account is to be measured formally by the number of distinct statements it requires, it is simpler to set up /k/ as the consonant in the proto-language, rather than /s/, for as shown in (3c) and (3d) we need only three rules in the former case, but four in the latter case.

(3c) IE /k/ --> Germ. /h/   (3d) IE /s/ --> Lat. /k/

                  Baltic /s/   Greek /k/

                  Sanskrit /ś/   Germ. /h/

                                                    Sanskrit /ś/

The same argument can be made against setting up /s/ or /h/ as the consonant in the proto-language. In fact, there is additional evidence against the account in (3d). Consider the facts in (3e):

(3e)   Latin   Greek   Germanic   Baltic   Sanskrit

       sen-   hen-   sin-   sen-   san-   "old"

                      (Gothic sinista)

These facts would obviously lead us to postulate an /s/ in the proto-language, which then underwent change to /h/ in Greek; i.e., (3f).

(3f)   IE /a/ --->   Greek /h/

But if (3d) is also to be included in our account we have to hypothesize
two distinct /a/ in the proto-language, or, since this is not a very
plausible hypothesis, to find some special context in Greek in which
(3d) holds and a different context in which (3f) obtains.
Alternatively, we might postulate that Greek /h/ represents the original
state in the proto-language and that the other languages represent
identical parallel developments. All these alternatives are, of course,
logically possible, but since there is no evidence that forces us to
adopt them over the simpler alternative, consisting of the statements
(3c) and (3f), it is the latter alternative that has been adopted.

The method of reconstruction illustrated above was based on a
number of theoretical premises which were rarely, if ever, made
explicit. The most important among them are those in (4):

(4)   a.   Knowledge of the words of a language (or of its
           lexicon) and of the list of its phonemes (alphabet)
           are essential components of each speaker's knowledge
           of the language.[1]

      b.   In learning a word the speaker commits to memory a
           sequence of discrete phonemes.

      c.   Speakers may change the pronunciation of particular
           words by altering directly the phoneme sequence
           representing the words in question, or by making
           changes in the phoneme alphabet of the language.

Given the propositions in (4), the discoveries that were illustrated
above can be viewed in the following light. Linguists had information
about the words making up the lexica of a number of languages and
discovered in them regular correspondences of the sort exemplified in
(1)/(2) above. They accounted for these correspondences by invoking
proposition (4c) and by postulating a single underlying source in the
proto-language from which the attested reflexes in the daughter
languages were derived by means of "phonetic laws" such as those
illustrated in (3) above.

I remarked above that the premises in (4) were hardly ever
discussed by nineteenth century linguistics. The issues that attracted
much attention were the status of the sound laws, especially the
ontological status of sound laws, and their supposedly exceptionless
manner of operation. On rereading some of this literature recently I
got the distinct impression that what bothered people like Schuchardt
and other opponents of the neo-grammarians was the need to admit that
all speakers of a language -- including here young children and
illiterates -- possessed knowledge of such an abstract matter as the
phoneme list, the alphabet of their language. Since it was difficult
for them to conceive of a way in which a young child or illiterate might
acquire knowledge of the alphabet of his language, they were unwilling to

admit that the alphabet was part of every fluent speaker's knowledge of his/her language. Being hard-headed empiricists, they were willing to admit only that speakers know the words. As a consequence, there were, for them, no wholesale sound laws such as those exemplified above; rather, according to them, each word had its own history.[2] Their neo-grammarian opponents assumed that changes affected phonemes in the alphabet and hence all words in which the changed phoneme figured underwent change en masse. But being in their philosophical prejudices at least as hard-headed empiricists as their opponents, the neo-grammarians were unwilling to admit explicitly that speakers might have knowledge of such an abstract concept as the alphabet of their language. They were no doubt afraid that someone might embarrass them by asking them to show how the alphabet of a nonliterate language might be learned. The idea that speakers might learn the alphabet as a by-product of learning the words of their language was, to my knowledge at least, never considered.

It is, therefore, hardly cause for wonder that the famous debate concerning the exceptionless quality of the soundlaws never settled anything. In a book significantly entitled Are There Sound Laws? the German linguist E. Wechssler wrote in 1900: "The struggle over the sound laws which broke out in 1876 and has been waged with especial vigor since the middle of the 1880's has now subsided. It is only infrequently now that anyone takes up this question. The results of the long debates are rather curious. In practice the sound laws have proven themselves everywhere . . . Nonetheless weighty objections against the theory have been advanced by its opponents, and these have not always been refuted, so that today it (the theory) is no longer defended with quite the same fervor as before . . ." In sum, people just got tired of the topic, and as it often happens in such cases a compromise was adopted to paper over the differences that had not been resolved. The compromise consisted in assuming that the phonetic laws are not part of a speaker's knowledge of a language, but that they are, rather, statements expressing regularities discovered by linguists. As Meillet wrote in his Introduction à l'etude comparée des langues indo-européennes, "what is ordinarily called a 'phonetic law' is thus only a formula for a regular corresponoence, either between two successive forms or between two dialects of the same language." (p. 30) It is specifically not something that a speaker of a language knows and uses in order to process utterances in this language. It is with regard to these questions that Jakobson proposed answers that were markedly different from that of the majority of linguists active in the decades between the two wars.

In December 1926 Trubetzkoy received from Jakobson a "vast letter" which "advocated the necessity of discarding the neogrammarian and Saussurian attitude toward sound changes as blind and fortuitous events irrespective of language system and contended that this mechanistic and atomizing approach has to be supplanted by an intrinsically linguistic interpretation of changes as constituents of the phonological system which undergoes them." (Jakobson 1975, fn. 2, p. 96) This letter, of which the text has not survived, evidently dealt with the issues which

less than a year later were presented to the First International
Congress of Linguists as a joint communication of Jakobson, Trubetzkoy
and Karcevski and which shall be examined in some detail below.

Trubetzkoy responded with a long and interesting letter in which he
expressed his agreement with Jakobson's ideas: "With your general ideas
I am in complete agreement . . . the general lines of the history of a
language . . . always turn out to be anything but accidental and hence
the different details must also be nonaccidental; the problem is only in
grasping their significance. The sense of the evolution of a language
directly follows from the fact that "a language is a system...." If
Saussure did not dare to draw this logical conclusion from his own
thesis that "a language is a system", this is largely due to the fact
that this conclusion would have contradicted not only the generally
accepted picture of the history of a language, but also the generally
accepted view of history. For the only sense that is admitted in
history is the notorious notion of "progress" . . . From the viewpoint
of general historians one can establish for language only such "laws" as
"the progress of civilization destroys the dual number" (Meillet) --
i.e., . . . laws that first of all are quite dubious and that moreover
are not purely linguistic. However, the careful study of languages with
special attention to the internal logic of their evolution teaches us
that there exists such a logic and that one can establish a whole series
of purely linguistic laws which are independent of such nonlinguistic
factors as "civilization" etc. But, of course, these laws will not
refer to "progress" or "regress" -- and therefore from the viewpoint of
general historians (and of evolutionists in general; i.e., ethnologists,
zoologists, etc.) they will lack the main "ingredient" of evolutionary
laws. And for this reason, this view on the evolution of languages
encounters active opposition."

I have quoted from Trubetzkoy's letter at such length because it
brings out very clearly not only the profound differences in conception
that separated at that time Trubetzkoy and Jakobson from almost all
other workers in the main stream of linguistics, but also because it
shows that in spite of these differences, Trubetzkoy and Jakobson still
saw the central issue in linguistics to be an account of linguistic
change, a position that they abandoned within a few years almost without
discussion.

In those days the programs of international congresses of linguists
were organized as attempts to deal with a number of general questions.
One of the questions that was put before the First International
Congress was "what are the most appropriate methods for a complete and
practical description (Fr. exposé) of the phonology of a language?" and
it was as a reply to this question that Jakobson wrote a brief summary
of the ideas discussed in his letter to Trubetzkoy. The reply, which,
as already noted, was co-signed by Trubetzkoy and Karcevski, begins with
the declaration: "Every scientific description of the phonology of a
language must above all include a characterization of its phonological
system; i.e., a characterization of the repertory, pertinent to that
language, of the distinctive contrasts among its acoustico-motor

images". [3] The statement notes that there is need for a study of these distinctive contrasts in different languages and then immediately turns to the consequences that this new approach will have for the topic that was then at the center of linguistic research, the study of sound change, and asserts that "the antinomy between synchronic phonology and diachronic phonology (which was one of the major conclusions that linguists had drawn from Saussure's Cours de linguistique générale -- MH) is removed as soon as the phonetic changes are considered as a function of the phonological system that undergoes them . . . Historical phonology is then transformed into a history of the evolution of a phonological system." (Jakobson (1962) I, p. 3). The statement goes on to explain that "the synchronic phonology of a language has been restricted, in a majority of instances, to a characterization of the sounds from the viewpoint of their production without taking into account their role in the phonological system. Hence the distinctive contrasts themselves are not adequately defined and distinguished from extra-grammatical differences . . . However, this definition is not sufficient in itself: it is necessary to specify the types of phonological distinctive contrasts. There are two types of contrast, for certain of these correlations stand in a regular relationship with one another, i.e., the absence of a given correlation is regularly connected either with the absence, or the presence of another correlation in the same system . . . This regular connection among correlations, readily explained from a psychological point of view, is one of the most important factors of phonetic change: the loss or the appearance of a correlation frequently imposes the need to reconstruct radically the phonological system. It is thus that we pass from the domain of synchrony to that of diachrony . . ." (Jakobson (1962), I, p. 4-f.)

From the viewpoint of the methodology of historical phonology, this statement can be viewed as a proposal for adding to the premises (4) the propositions (5a) and (5b):

(5) a. The phonemes of each language constitute an abstract structure of phonetic contrasts. This structure called the phonological system of the language is an essential component of the knowledge that speakers have of the language.

     b. The phonological system imposes limits on the changes that a language may undergo. For example, certain of the phonetic contrasts stand in a regular relationship with one another so that the presence in the system of one contrast requires the presence (respectively, the absence) of another contrast. As a consequence, changes in one part of the system will automatically result in changes in another part.

In 1929, two years after writing the communication to the First International Congress of Linguists from which we have quoted above, Jakobson published his _Remarques sur l'evolution phonologique du russe comparée a celle des autres langues slaves_ which provides a detailed illustration and defense of the new methods he was advocating for historical phonology. As even a superficial comparison with any standard historical phonology of a language that was published at that time -- e.g., Meillet-Vaillant _Le Slave Commun_ (Paris, 1934) or Durnovo's _Vvedenie v istoriju russkogo jazyka_ (Brno, 1927) -- will reveal this work exemplifies a totally new way of doing historical phonology.

Perhaps the most striking difference between _Remarques_ and most other studies in historical phonology is that in _Remarques_ Jakobson focusses primary attention on phonological processes and cites attested forms to illustrate the operation of these processes whereas the standard procedure in historical studies is to focus on the attested forms and to discuss the processes involved only by the way, as somewhat marginal speculations about the reasons for the forms. This difference is, of course, not an accident. It is a consequence of the fact that to Jakobson's predecessors the only things that have linguistic reality are the list of phonemes and the words; to Jakobson, by contrast, the phonologic system has at least as much, if not greater, phonologic reality, than the phonemes and the words, because the system determines in an essential manner the form of the words, it provides the building blocks out of which the words are constructed.

I have talked much about phonological systems and their role in the economy of a language; it is time to examine one such system in some detail. In (6) I have reproduced a slightly modified version of the phonologic system of Modern Russian proposed by Jakobson in _Remarques_

(Jakobson (1962) pp. 13-14, slightly modified):[4]

```
(6)    i, í          u, ú                        vowels
            é        ó

          a, á            _____

          j                                       glides
                        _____

   r,r'  l,l'  n,n'   m,m'      consonantal sonorants
                        _____

      ž̌   ž̌':
     --- ---
      š̌   š̌':

     [ʒ]  [ǯ']
     ----  ----
      c    č'                          obstruents

  g,[g']  [γ, γ']
  ------  --------
  k,[k']  x ,[x']


  d, d'   z, z'   b, b'   v, v'
  -----   -----   -----   -----
  t, t'   s, s'   p, p'   f, f'
```

The table is subdivided into the four major classes that I have
indicated on the right: vowels, glides, consonantal sonorants and
obstruents. Among the vowels three types of contrasts are represented:
stressed-unstressed, front-back, and (vertically) tongue height, of
which three degrees are distinguished. The points of articulation of
the consonants are only imperfectly represented. On the other hand, the
contrasts between stops and continuants, voiced and voiceless, and
"hard" and "soft" consonants, are systematically taken account of by
several graphic devices such as placement of the symbols in close
proximity to one another, separating them by commas (horizontally) and
by horizontal lines (vertically).

     I shall now illustrate in summary fashion how Jakobson viewed the
process of evolution of a language. This illustration should be
compared with the account of the methods of Jakobson's predecessors
cited above (p. 6). As is well known, the contrast between "hard" and
"soft" consonants is a special development within Slavic proper not
shared by all Slavic languages (e.g., neither Serbo-Croatian nor
Slovenian utilizes this feature). The contrast is also absent in most
other Indo-European languages, and it must therefore be supposed to have

been lacking in proto-Slavic. The task of the historical linguist is, therefore, to account for the evolution of the Russian consonant system (6) from a system in which the consonants to the right of the comma were systematically missing.

Jakobson provides evidence showing that one of the earliest developments within Slavic was the establishment of "syllabic synharmonism".[5] According to Jakobson, "At the beginning of the independent existence of Proto-Slavic, the phonological system of that language included, among other correlations, that of "palatality vs. labiovelarity of vowels . . . A tendency that traverses like a red thread the entire period under consideration is the uniformization of the syllable. There developed gradually a harmony of the sounds belonging to each syllable . . . one sees the crystalizing of two types of syllables -- soft and hard. This tendency was realized by a process of assimilation which was regressive as well as progressive." (p. 25) Jakobson thus views "syllabic synharmonism" as a process that spreads certain features from the vowel of a syllable to its consonants. As a result of this assimilatory process "soft" consonants appeared in syllables with front vowels and "hard" consonants appeared in syllables with back vowels.

A number of things must be noted about this account. The assimilation process transmits to the consonants only certain features of the vowels -- i.e., lip rounding and palatal tongue position -- but not others -- i.e. tongue height. This brings out the important insight that phonemes are not the ultimate atoms of language, but that phonemes are themselves composed of readily identifiable properties (later to be called distinctive features) and that it is these properties that are directly involved in phonetic change. As a result, phonetic change affects whole classes of sounds rather than individual phonemes. One example of this is the Common Slavic case under discussion. Another example was illustrated in (1)/(2) above where it was shown that in Germanic not only /p/ was turned into /f/ but also /t/ into /θ/ and /k/ into /x/ -- i.e., where voiceless stops were turned into continuants leaving all other properties of these consonants intact. This kind of generalization had no special status in pre-Jakobsonian linguistics, where phonemes are the ultimate constituent elements, and the fact that certain subsets of phonemes undergo common changes whereas others do not, remains without explanation.

A second fact to be noted is that the features involved in such phonological changes are the same properties that constitute the abstract structure of contrasts in the phonological system of a language as was illustrated in the chart in (6).

Finally, Jakobson treats the distribution of "softness" and "hardness" in common Slavic as a property of entire syllables. Because it was as yet not a property of individual consonant phonemes, the contrast "softness/hardness" was not included by Jakobson in the phonological system of early Slavic. Although not fully appreciated at the time, this move was of fundamental importance, since it implied that

the information about the phonetic form of an utterance need not be given in its entirety in the phoneme sequence that represents it, but that part of this information is contained in special rules of implementation which in many cases are identical with well known "phonetic laws". In fact it is these rules of implementation that are the primary vehicle of phonetic change. Again this contrasts sharply with the pre-Jakobsonian view briefly discussed above, that "phonetic laws" are abstractions of linguists, not part of the knowledge that speakers possess of their language.

In the course of their further development all Slavic languages underwent what is referred to in the literature as the "deletion of weak yers." For present purposes the only thing that we need to know about this process is that yers were vowels, and that like all vowels they were involved in a crucial fashion in the establishment of "syllabic synharmonism." The deletion of vowels in a word has as an immediate consequence the transformation of certain open syllables -- i.e., syllables ending with a vowel -- into closed syllables -- i.e., into syllables ending with a consonant. Since in Slavic, "synharmonism" did not extend beyond the syllable, sequences where a "hard" syllable followed one that was "soft" or vice versa, were perfectly common. Consider now what happens when a "hard" syllable is followed by a "soft" syllable containing a weak yer and this yer is deleted. Since the yer deletes, the onset consonant of its syllable is automatically incorporated into the rime of the first syllable. This new syllable, however, violates the principle of "syllabic synharmonism" since it begins with a sequence of "hard" phonemes but ends with a "soft" consonant. We illustrate this graphically in (7):

			hard	soft		
(7) CV	CV	------------>	CV	C'V	-------->	CV C'
back	front	synharmonism	b	f	deletion	b
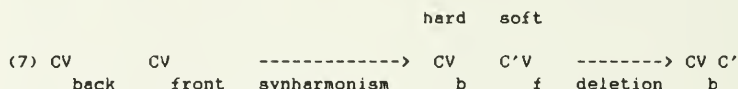
Since the principle of "syllabic synharmonism" is thus violated in the language, the phonetic facts can no longer be expressed according to Jakobson by means of the rule implementing this harmonism. Hence the rule of "syllabic synharmonism" can no longer figure in the language and the "hardness" and "softness" of consonants must be indicated directly in the lexical representation of each word. But this in turn implies that the phonological system of the language must now include both "hard" and "soft" consonants.

The historian of language, thus, sees the following stages in the evolution of Russian. In the earliest stage the language has a phonological system that does not distinguish "soft" and "hard" consonants in its inventory. At this stage the language is subject to the process of "syllabic synharmonism." At a second stage the language becomes subject to yer deletion. This new process results in utterances that violate the principle of "syllabic synharmonism" and, as a consequence, the rule establishing "syllabic synharmonism" is dropped

and the language reconstructs its phonological system by establishing two series of consonants, "soft" and "hard", in its phoneme inventory.

After receiving a copy of Remarques, Trubetzkoy wrote to Jakobson: "Your book is overloaded with ideas. Moreover, these ideas are, for the average reader, totally new, unusual. Taking into account the relatively low intellectual level of the average linguist, you should have tried for maximal clarity and chewed everything over and over . . . (p. 146) After discussing some examples, Trubetzkoy concludes: "It is obvious that the writer is a person who not only is rich in ideas, but who also is possessed of a marked temperament. But all this will be seen and appreciated only by a thoughtful reader -- and such (readers) are in the minority. The average reader linguist (à la Belić) will simply not understand anything."

Trubetzkoy's prediction that "the average linguist . . . will simply not understand anything" was, unfortunately, quite correct. To my knowledge there were seven reviews of Remarques in the linguistic journals of the period, of which only one, that of André Mazon in La Revue des Etudes Slaves (10, 104, 1930), was outright hostile and negative. Unfortunately the favorable reviews did not serve to convey to their readers a proper appreciation of this book in which, as was noted by Polivanov in his review, Slavia 11, 141-146 (1932)) the author seeks "not only to establish the presence of a given sound change . . . but also to justify -- i.e., to explain pragmatically -- this sound change as the result of certain evolutionary factors recognized by the general theory of phonetic evolution."

As regards the research activities of linguists working on phonetic change Jakobson's Remarques remained without consequences. As Horace Lunt (1983) has written: "Echos of Jakobson's views on historical Slavic linguistics are rare before about 1950. One of the first was a 1950 Uppsala dissertation Zu den Haupttendenzen der urslavischen und altrussischen Lautentwicklung. The author, Birger Calleman, cites Remarques and the complementary "Prinzipien der historischen Phonologie" of 1931 . . . as reflecting a promising approach but one too unclear and lacking detailed exemplification (my emphasis - MH) to be useful (and burdened with a disturbing teleological element)".

It is possible that one reason for this lack of comprehension is "the relatively low intellectual level of the average linguist" mentioned by Trubetzkoy in his letter which I have quoted above. But this is not the complete explanation. In particular, it does not explain the striking fact that neither Trubetzkoy nor Jakobson ever developed further the ideas of Remarques. As I indicated at the beginning of this paper, I believe that the main reason for this surprising fact is what the philosopher T. Kuhn would have termed "a shift in the scientific paradigm." In the 1930's it became apparent that not only the methodology, but also the problems of linguistics were in need of fundamental revision. It seemed at that time to many linguists that there remained few problems to solve and that the scholar in search of a problem was faced -- as Benveniste put it in 1935 in the preface to his Origines de la formation des noms en indo-européen --

with the choice of working either on the known or on the unknowable. On the other hand, the studies of Jakobson, Trubetzkoy and others had drawn attention to the importance of the phonological system and to other synchronic properties of languages, of which very little was known at that time. These huge gaps in our knowledge seemed in those days rather easy to fill. It is, therefore, not surprising that many workers chose to concentrate on the study of language as a synchronically functioning system rather than to continue the studies of phonetic change so important to preceding generations. During the war years 1939-45 most research in linguistics came to a virtual halt except for studies aimed at improving the teaching of foreign languages to military personnel, and this fact served to amplify further the tendency on the part of linguists to work on synchronic problems. The end result of these changes was the radical shift in focus in linguistics that was mentioned above. At the end of the 1940's problems in diachronic linguistics, which had been at the center of linguistic research for well over a century, had become unfashionable to a point where even Jakobson himself never found the occasion to return to the issues that he had raised and partially resolved in Remarques.

Revolutions always exact their costs, and this is true also of scientific revolutions. In the case of the revolution in linguistics that we have been talking about, among the costs we must reckon the fact that the great potential of Jakobson's ideas for the study of phonological evolution has remained unrealized. I do not mean to imply that there has been no progress in diachronic phonology in the last half century. There is no question in my mind that important advances have been made. The discovery by Kuryłowicz of the significance of Hittite laryngeals, the important books of Benveniste on word formation in Indo European and the work on Slavonic accentuation by Stang, Illič-Svityč, Dybo and P. Garde are major advances comparable in significance to the epochal discoveries of the 1870's. Nonetheless we must note that these studies -- with the sole exception of Garde's -- continue in the older pre-Remarques tradition and were quite unaffected by the perspectives opened up by Jakobson. Fortunately, these losses can be made up -- the text of Remarques is easily obtained even if the price of the first volume of the Selected Writings of Roman Jakobson is a bit high for the average linguist. It is thus not impossible that the highly original ideas that Jakobson advanced in 1929 will yet find fuller development in the research of a generation of scholars who never knew their originator. If this paper helps to hasten this development, it will have achieved its primary goal.

NOTES

*This paper is an expanded version of a communication presented at the First Roman Jakobson Colloquium, October 5, 1984 in Cambridge, Massachusetts. Its roots go back to a joint study of Jakobson's *Remarques* that T. Lightner and I were planning to write after Lightner completed his doctoral dissertation.

[1] The phonemes are not the sounds themselves but rather are abstract mental entities which, in the words of Hermann Paul, "establish the connection among the diverse physiological events and create a causal relationship between earlier and later productions of the same sound complex." (Paul, p. 49).

[2] In his pamphlet *On the Soundlaws* -- *Against the Neogrammarians*, Schuchardt objects to the procedure "of isolating the consideration of individual sounds from that of the word in which it occurs. The change of a sound [in sound change - mh] . . . consists of a sum of microscopic displacements and is, therefore, dependent on the number of times it is repeated. If, e.g., [the sound] x requires 10000 repetitions to become x^1, these repetitions must be counted with respect to individual words; an x pronounced in 10000 different words would never become x^1." (p.26) Discussing the standard explanation of specific exceptions to certain well known sound laws by means of conceptual analogy, Schuchardt suggests that conceptual analogy is the explanation for all sound change, not only for exceptions to the sound laws. In opposition to the neogrammarians, Schuchardt states that "sound change . . . begins in individual words and then is transmitted to other words." (p. 29) He rejects as incomprehensible Delbrueck's argument that foreign language acquisition (specifically, the uniform mispronunciation of particular sounds by the learner) shows that sound change does not begin in individual words. "Given the gradual spread of some sound changes, might not the idea arise that conceptual analogy works against the sound laws only in some cases, whereas in general it works in tandem with the sound laws?" (p. 30)

[3] The term "acoustico-motor image" which appears to have been borrowed from Baudouin de Courtenay was a circumlocution for the term "phoneme".

[4] The consonants enclosed in square brackets should -- strictly speaking -- not have appeared in the diagram, for they are not part of the phoneme system of Russian, they are positional variants of particular phonemes or *allophones*, to use a term that became popular a decade or more after the publication of *Remarques*.

[5] Such "syllable synharmonism" is a feature of a number of languages; e.g., modern Turkish; see Clements and Sezer (1983).

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THE PHONOLOGY AND SYNTAX OF WH-EXPRESSIONS IN TANGALE

Michael Kenstowicz

In this paper we briefly introduce two sandhi
rules of Tangale phonology. We show that they un-
expectedly fail to apply before direct objects con-
taining a wh-expression and on this basis argue for
a string-vacuous movement of wh-expressions to a
post verbal Focus position.

Study of the phonology-syntax interface has typically
proceeded by asking the following question: What aspects of
syntactic structure are relevant for the application of
phonological rules? Several years study of the question by a
number of persons (e.g. Kaisse 1985, Selkirk 1984) suggests
that phonological rules may be sensitive, either directly
or indirectly, to the surface syntactic constituent
structure----typically through extension of the notion of
government or c-command. Phrasal phonological rules do not
appear to be sensitive to differences in grammatical relations
(e.g. subject versus object) unless these are encoded as
different surface constituent structures. Nor do phrasal
phonological rules (as opposed to lexical rules) appear to be
sensitive to different syntactic features such as [+/-noun] or
[+/-wh].

However, the phonology-syntax interface can also be approached
from a somewhat different perspective by asking the following
question: Can the application or the blockage of phrasal
phonological rules tell us something about the surface syntactic
structure----in particular something that we did not already know?
To see what I have in mind here, consider the sentence of (1a).

(1)   a. Who left?
       b. [Who left].
            S
       c. Who$_i$ [e$_i$ left].
            S

As far as I know there are no syntactic grounds internal to the
grammar of English to tell us whether this sentence has the
surface structure of (1b) with Who in subject position or that
in (1c) with Who in Comp and a trace in subject position (or

indeed whether both are possible). If there were phrasal
phonological rules sensitive to the difference in structure
then they could be exploited to resolve this question.

In this paper we shall examine briefly some aspects of the
phrasal phonology of Tangale from this perspective. We shall
argue that they present a case analogous to the English <u>Who</u>
<u>left</u>? Tangale is a Chadic language of Northern Nigeria spoken
by about 100,000   persons.[1] In our transciptions the acute
accent marks high tone; low-toned syllables are unmarked.   In
this paper our transcriptions abstract away from the tonal
modifications induced by pause.

Two sandhi rules will be relevant for our discussion, a rule
of vowel elision and a rule of tonal delinking.   The elision rule
is stated informally in (2). It elides the final vowel of a stem
or a word when in close syntactic connection with some following
phonological material denoted by the X.

(2)   V ····> Ø / __] X

Vowel elision is a pervasive process of Tangale phonology
applying in diverse contexts both word-internally as well as on
the phrasal level.   Word-internally, it applies when a suffix is
added to a vowel-final stem.   Some examples are cited in (3).[2]

(3)   a. noun plus possessive suffix

　　　　ayaba　　 'banana'　　　　kwáli 　　'calabash'
　　　　ayab-nó 'my banana'　　　kwál-ží 'your calabash'

　　　　duka 　　'salt'　　　　　 basre 　'work'
　　　　duk-wú　 'their salt'　　 basur-mú 'our work'

　　 b. noun plus definite suffix

　　　　tuužé　　　'horse'　　　　lawo 　　'child'
　　　　tuuž-í　　 'the horse'　　law-í　　 'the child'

　　 c. compound noun

　　　　kama　　　 'waist'
　　　　pído　　　 'tree'
　　　　kam-bído　'tree trunk'

　　 d. verb plus past tense suffix -gó

　　　　padé 　　'buys'　　　　　tuké 　'hides'
　　　　pad-gó　 'bought'　　　　tuk-kó　'hid'

　　 e. verb plus object suffix

　　　　kasé 　 'cuts'　　　　　 tuké 　'hides'
　　　　kas-nó　'cuts me'　　　　tuk-mú 'hides us'

f. verb plus object suffix plus past suffix

kas--nó	'cuts me'	tuk--tó	'hides her'
kas--kó	'cut'	tuk--kó	'hid'
kas--ún--gó	'cut me'	tuk--úd--gó	'hid her'

Elision also applies at the phrasal level. It will obligator--
ily delete the final vowel of a head noun when followed by a
complement (4a). It will also obligatorily delete the final
vowel of a verb before a direct object (4b).

(4) a. baana   'beads'   kwáli   'calabash'
       baan Kay 'Kay's beads' kwál Malay 'Malay's calabash'

    b. padé   'buys'   na né wá--no 'I am going'
       pad lútu   'buys bag'   na né wá--n mána 'I am going home'

       mal--gó   'beat'
       mal--ug Kây 'beat Kay'

Given that there must be a close syntactic relation between the
first word and the following one in order for elision to take
place, there are phrasal contexts where elision is impossible.
First elision does not normally apply between a verb or the final
element of a verb phrase and a following adjunct phrase (5a). In
general, elision also blocks between a subject and a following
verb phrase. In (5b) and (5c) we illustrate two such cases. In
the first, the VP begins with a particle marking tense or aspect
while in the case of (5c) the copular verb is not expressed and
the verb phrase consists of simply a predicate nominal or
adjective.

(5)   a. Kay múdúygó. 'Kay died.'
          Kay múdúygó sórum kobgó. 'Kay died last week.'

       b. Kwala wa padé.   'Kwala will buy [it].'
          Kwala né padé.   'Kwala is buying [it].'

       c. Kwala dasa.   'Kwala [is] bad.'

There is one case in which the final vowel of a subject NP may be
elided. This is when the verb is in the past tense, which, as we
have seen, is marked by the suffix --gó. In this context
application of elision is optional.

(6)   a. Kwala múdúygó.   'Kwala died.'
          Kwal múdúygó.   ibid.

       b. sogló   'fish'
          soglo yúblúd--gó 'fish dove down'
          sogul yúblúd--gó   ibid.

       c. sogulnó   'my fish'

```
sogulno yúblúd--gó    'my fish dove down'
soglun yúblúd--gó     ibid.
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The past tense is peculiar in several other respects. First, it
is the only tense--aspect category marked by a verbal suffix
instead of by a particle between the subject and the verb.
Furthermore, the past suffix --gó appears after a pronominal
object suffix (e.g. kas--ún--gó 'cut me' from /kasé+nó+gó/) while
all other verbal suffixes precede the direct object marking
suffixes. It is thus conceivable that there is a special
readjustment rule raising the verb to precede the INFL in the
past tense and that this operation, somehow, brings the preceding
subject NP and the verb into close enough proximity to permit the
elision rule to operate. Putting this one case aside, we can say
that the elision rule operates in a phrasal context where there
is government between the first word and the following one----a
fairly typical condition on rules of sandhi. Another way of
interpreting this is to postulate that the surface syntactic tree
is parsed into units defining the domain of operation for the
phrasal sandhi rules. A natural parse would be into major
phrasal categories; since Tangale is a head--initial language the
initial element of each phrase is also the governing element.
Thus it is unclear here whether the relevant notion is really
government or simply edge of a domain. This is obviously an
important question, but one that is beyond the scope of this
paper.

       The second sandhi rule that will concern us is one component
of a two step tonal process that has the effect of sliding a high
tone over one syllable to the right.   The two components of this
process are stated in (7).[3]

(7)   V V   V V   V V
      | ----> |/   ----> |
      H   H   H

In the first step a high tone is spread onto a following
tone--bearing unit (essentially the syllable in Tangale) to create
a multiply--linked representation with one high tone arching over
two successive syllables. In the second step the multiply--linked
tone is delinked from the initial TBU. The resultant unlinked
syllable then acquires a low tone by a default rule. The joint
effect of these two processes is to shift a tone one syllable to
the right. Tangale is interesting in this regard in that the
intermediate stage of a multiply--linked high tone is attested on
the surface. This arises from the fact that the delinking
process is constrained to apply in essentially the same
syntactic configurations as the elision rule while the spreading
rule has a larger more inclusive domain of operation. The
process of spreading a tone and then delinking the original link
is a rather common diachronic process. Tangale is unusual in
showing the intermediate stage of a spread tone in certain
contexts. It leads to the conjecture that there are no rules of
tonal shift and that all apparent cases should be analyzed into

spread cum delinking operations.

The delinking process applies word-internally when a suffix
is added to a stem ending in a high tone (8a). Most suffixes are
underlyingly associated with a high tone; the spreading part of
the process in (7) is thus phonetically (but not phonologically)
vacuous. One example we can cite where a suffixal high tone
clearly originates from the stem arises in conjoined NP's where
the conjunction <u>ka</u> 'and' is cliticized or suffixed to a stem
(as evidenced by the change in voicing (7b)). The conjunction
appears with a low tone in (7b) but with a high in (7c) resulting
from spread and delinking.

(8) a. kukúl   'pot'
         kukul-nó 'my pot'

     b. twan 'axe', sakâm 'knife'
         twan-ga sakâm 'axe and knife'

     c. kukúl 'pot'
         kukul-gá sakâm 'pot and knife'

Delinking will also apply within an NP or a VP between the head
and a following complement. (Since all verbs end in a vowel, the
VP examples evidence elision rule as well).

(9) a. kukúl 'pot', Kay   swadé 'hits'
        kukul Kây 'Kay's pot'   swad Kây 'hits Kay'

To briefly illustrate our analysis, we assume the derivation in
(10) for an associative construction such as <u>kukul Kây</u>.

(10) kukul Kay   kukul Kay   kukul Kay
       | | | | | /| | |\
       L H   L   ----> L H   L   ----> L   HL ---->

      kukul Kay
       | | |\
       L L   HL

When we turn to broader syntactic contexts we find that the
delinking component of the tonal process of (7) is in general
blocked. In verb or VP plus adjunct constructions spread may
apply so long as there is no pause between the two elements; but
the delinking process may never apply. The result is a high tone
spread over both syllables.

(11) waygó 'left', sorum kobgó 'last year'
      waygó sórum kobgó 'left last year'
      padug málafá 'bought a hat'
      padug málafá sórum kobgó 'bought a hat last year'

An analogous state of affairs obtains in predicate nominative
constructions where we find spread but no delinking (or elision).

(12)　kukúl 'pot', koŋ 'good'
　　　 kukúl kôŋ 'the pot [is] good'

　　　 dasa 'bad'
　　　 Asabé dása 'Asabe [is] bad'

The tense-aspect particles do not accept a spread tone from a
preceding subject noun (13a) nor do they spread their tone onto a
following verb (13b). Hence they can tell us nothing about the
scope of the delinking process.

(13)　a. Asabé wa padé　　'Asabe will buy [it]'
　　　 b. Malay né padé　　'Malay is buying [it]'

Finally in the past tense the spread and delinking processes
seem to be obligatory even if the option of not applying the
elision rule is chosen. This is the one context where the scope
of elision and delinking do not perfectly coincide.

(14)　kukúl 'pot', kebúd-gó 'broke'
　　　 kukul kébúdgó 'pot broke'

　　　 ší 'you', pad-gó 'bought', twan 'axe'
　　　 ši pádug twân 'you bought an axe'

　　　 Asabé, swad-gó 'hit', Kay
　　　 Asab swádug Kây 'Asabe hit Kay'
　　　 Asabe swádug Kây ibid

　　　 To briefly summarize the discussion so far, we have intro--
duced two sandhi rules of Tangale (elision and delinking) whose
domain of operation consists of contexts where the first word
governs the second. The descriptive problem we want to confront
is that these sandhi rules fail to apply to a verb when the
direct object is a wh--expression. There are two wh--words rele--
vant to this point: naŋ 'what' and noŋ 'who'. The problem that
these expressions give rise to is illustrated by the paradigms
in (15).

(15)　a. Malay wa padé.　　　'Malay will buy [it].'
　　　 b. Malay wa pad yálam.　'Malay will buy oil.'
　　　 c. Malay wa padé náŋ.　'What will Malay buy?'

　　　 d. Kay dobgó.　　　　 'Kay called.'
　　　 e. Kay dobug Málay.　 'Kay called Malay.'
　　　 f. Kay dobgó nóŋ.　　 'Who did Kay call?'

(15a,d) show the underlying forms of the verbs. In (15b,d) we
see the effects of elision (and delinking) between the verb and

the following direct object since they are in a government
configuration. However, in (15c,f) no elision may take place and
only the spread component of the tonal shift process of (7)
applies. Note in particular that delinking is blocked.

A possible solution to this problem is simply to permit the
phrasal rules of elision and delinking to be sensitive to the
value for the feature [wh] of the second word, requiring it to be
minus. If elision and delinking only take place between words
when the second word is [--wh], then the sandhi rules will block
in (15c,f) but still apply in (15b,e). But such a solution would
be undesirable on theoretical grounds since sandhi rules are
typically not sensitive to the feature structure of individual
words and only pay attention to their hierarchical relationships
in defining the application domains for phonological rules.
Permitting the rules to refer to the [wh] feature would increase
significantly the power of the phonological component and thus
relax the tight constraints that presumably hold on the phono-
logy--syntax interface.

In addition to the theoretical point just made there are
a couple of descriptive problems this proposed solution faces as
well. The first is that the rules of elision and delinking do
apply obligatorily within a noun phrase whose complement noun is
a wh--expression. This point is illustrated by (16a) and (16b),
respectively.

(16)   a. ayaba   'banana'
            ayab noŋ   'whose banana'

        b. kukúl   'pot'
            kukul nóŋ   'whose pot'

Of course, one could argue that if sandhi rules can have access
to the feature [wh], then they should also have access to the
features differentiating a noun from a verb and hence the
contrast between NP's and VP's that we see in (16) versus (15)
can be described. But it is not explained. For the question
arises whether it is arbitrary that NP's and VP's contrast in
just this way. Could the opposite state of affairs obtain where
the rules would apply before wh--objects but not before
wh--possessors?

More problematic is the rather striking fact that the
wh--word blocking elision and delinking need not be adjacent to
the verb. This is shown by the paradigm in (17).

(17)   a. Kay wa padé.   'Kay will buy [it].'
        b. Kay wa pad yálam Malay.   'Kay will buy Malay's oil.'
        c. Kay wa padé yálam noŋ.   'Whose oil will Kay buy?'

In (17b) we see elision (and delinking) applying before the
direct object NP [yalam Malay] 'Malay's oil'. But if a wh--word

noŋ is substituted for the nominal complement <u>Malay</u> to give
'whose oil', then elision and delinking may not apply to the
verb, as shown by (17c). To be consistent with these data the
sandhi rules would have to be granted the power to scan the
entire object NP searching for a [wh] feature to determine
application of the rule to the verb. But phrasal phonological
rules do not normally scan an entire phrase in this way in order
to produce such purely local effects as vowel elision or spread
of a tone one syllable to the right.

Thus on both theoretical as well as descriptive grounds
there is good reason to pursue an alternative approach to the
problem posed by the [wh] words. A hint at the direction in
which to seek a more viable solution is provided by the obser-
vation illustrated in (18) that wh--subject NP's are obligatorily
postposed to the VP in Tangale.

(18) a. Malay múdúdgó.   'Malay died.'
      b.*noŋ múdúdgó?   'Who died?'
      c. múdúdgó nóŋ?   ibid.

Tangale is a strict SVO head--initial language. But when the
subject is a wh--expression it must be moved to a position after
the VP, as shown by the contrast between (18b,c). Note that in
(18c) there is no elision of the final vowel of the verb múdúdgó
and that while there is tone spread from the verb to the
postposed wh--expression, no delinking takes place. Both these
facts suggest that the postposed subject is not in a government
relationship with the verb and thus that the S--structure of (18c)
is (19), with <u>noŋ</u> adjoined to S (or S'?).

(19) [e_i múdúdgó] noŋ$_i$
      S   S

Given the possibility of postposing a wh--subject NP, it is
possible to construct minimal pairs in which the sandhi rules
produce quite different phonological effects on the same
underlying sequence of words depending on how the words are
syntactically phrased. An example is given in paradigm (20).

(20) a. Malay padgó málaf nóŋ. 'Whose hat did Malay buy?'
      b. padug málafá nóŋ.   'Who bought a hat?'

In both (20a,b) we have the same sequence of words /pad+gó/
'bought', /malafá/ 'hat', and /noŋ/ 'who'. In (20a) elision (and
delinking) apply to the NP [malafá noŋ]; but since this NP
contains a wh--expression we see that, just as in (17c), elision
and delinking may not apply to the verb /pad+gó/. In (20b), on
the other hand, both rules apply to the verb since it governs the
object NP [malafá]. But no elision and delinking apply to <u>malafá</u>
in (20b); only tone spread has applied to link the final H of
<u>malafá</u> to the postposed wh--subject NP <u>noŋ</u>. If we assume that
the postposed subject is adjoined to S (or S') then the relation
between the VP and the postposed element will be isomorphic to
that holding between the VP and an adjunct phrase.[4] We know on

independent grounds that our rules of elision and delinking do
not apply in this configuration; hence both the syntax and the
phonology converge on the S--adjoined structure of postposed
material. This position is also one to which focused NP's move.
Thus, an appropriate response to (18c) is not (18a) but rather
múdúdgó Málay, with the subject NP focused and having the force
of the English cleft "It is Malay that died."

    Given the existence of this Focus position we are now able
to solve the problem posed by the wh--objects. We need merely
assume that they too move to this Focus position. The surface
structures of (15e) and (15f) will thus be as in (21a) and (21b),
respectively.

(21)

a.
```
              S
            /    \
          NP      VP
          |      /  \
          |     V    NP
          |     |    |
         Kay  dobgo Malay
                |
                H
```

b.
```
              S
            /    \
          S       Foc
         / \       |
        NP  VP     |
        |   |      |
       Kay dobgo  non
             |
             H
```
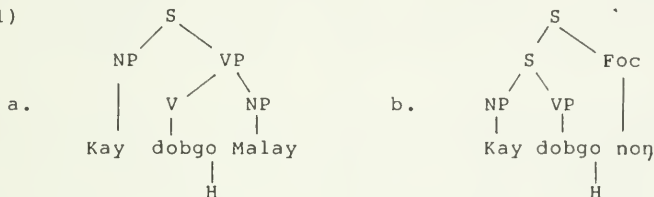
The elision and delinking rules will operate on the verb in (21a)
since it is in a government configuration with the following
NP. But the verb does not govern the focused NP in (21b) and
hence the sandhi rules do not apply. Our solution to the
problem of the contrast between (15e,f) is preferable to the
earlier one since it does not require making phrasal
phonological rules sensitive to the feature content of
constituents----only to their hierarchical arrangement.[5]

    Recall that we also criticized the initial solution because
it was unable to explain the contrast between (15) and (16).
The sandhi rules apply obligatorily inside an NP whose complement
is a wh--expression (16) but application of the elision and
delinking rules is suspended inside a VP whose direct object is a
wh--word (15). From our present perspective in which phrasal
phonological rules are only sensitive to differences in syntactic
phrasing we must seek an alternative explanation that does not
involve stipulating reference to noun versus verb directly in the
sandhi rules themselves but instead derives this contrast in
other ways. A hint at a plausible approach to this problem is
furnished by the paradigm in (22).

(22) a. law Malay múdúdgó.   'Malay's child died.'
     b. *law non múdúdgó.   'Whose child died?'
     c. múdúdgó láw non.   ibid.
     d. *law múdúdgó nón.   ibid.

(22a) is a sentence whose subject NP contains a nominal comple--
ment Malay in the role of possessor. When this complement is

replaced by a wh--word the sentence is ungrammatical (22b) unless postposing to Focus position takes place (22c). But note that Tangale exhibits the so--called pied--piping phenomenon in which extraction of a wh--complement expression entails the movement of the entire NP of which the wh--expression is a part. Extraction of just the wh--complement alone is ungrammatical (22d). Many other languages contrast nouns and verbs with respect to wh--movement in just this way; extraction of a wh--complement to a verb is possible while extraction of a wh--complement to a noun is not, necessitating recourse to the pied--piping alternative. Within the Government and Binding framework of Chomsky (1981) this contrast is brought under the Empty Category Principle which requires that empty categories such as the trace of NP--movement be governed by a restricted inventory of elements called proper governors. The unmarked state of affairs is for verbs to function as proper governors but not nouns or prepositions. Tangale is thus entirely regular in this respect.

Consequently our answer to the problem posed by the difference between nouns and verbs with respect to application of elision and delinking is again based on a difference in surface phrasal constituent structure alone rather than a stipulation of this difference directly in the statement of the sandhi rules themselves. noŋ may be extracted outside a [verb+noŋ] constituent since the verb properly governs the resultant empty category. But no such extraction of the wh--expression is possible from a [noun+noŋ] constituent since nouns are not proper governors. Consequently [noun+noŋ] structures always remain as a unit in surface structure, entailing application of the sandhi rules since the head noun governs the complement noun phrase. But the sandhi rules will not apply to a structure resulting from a deep structure [verb+noŋ] constituent since, according to our hypothesis, the noŋ is obligatorily extracted from object position to Focus position resulting in a surface structure in which there is no longer a government relation between the verb and the wh--word.

Our approach invoking movement of wh--expressions to a Focus position will also permit us to give an explanation for the "long distance" inhibitory effect of a wh--complement on the verb noted in (17c). We have assumed that there is obligatory movement of wh--expressions to Focus position and that Tangale exhibits pied--piping (a reflex of the unmarked state of affairs in which the verb but not the noun is a proper governor). Consequently when the object NP is complex and contains a wh--complement, the entire direct object noun phrase will move to Focus position giving the surface structure of (23) for a sentence such as (20a).

(23)

```
            S
          /   \
        S       Foc
       / \       |
     NP   VP     NP
```

Malay padgo [malafa noŋ]   (= Malay padgó málaf nóŋ.
        | | 'Whose hat did Malay buy?'
        H   H
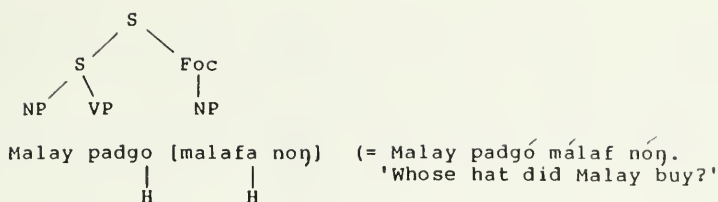
Elision and delinking will apply within the focused NP to the
governing head /malafá/. But these rules will fail to apply to
the verb /padgó/ since it does not govern the following focused
NP. Only the less restrictive tone spreading rule applies.

    To briefly summarize the discussion to this point, we have
examined two possible solutions to the problem posed by
wh--objects for the sandhi rules of elision and tone delinking.
One simply stipulates reference to the syntactic features [+/--wh]
and [+/--noun] in the statement of the phonological rules while
the other claims that the only syntactic information that phrasal
phonological rules are sensitive to is the hierarchical
constituent structure of the surface syntactic structure. We
have argued that there are reasons internal to the grammar of
Tangale for retaining the theoretically more restrictive
analysis, attributing the special behavior of wh--objects to a
difference in surface syntactic structure mediated by the
obligatory movement of wh--phrases to a Focus position. In the
case of direct objects, movement of wh--phrases to the Focus
position is string vacuous (having no effect on the linear order
of words) and the only direct evidence for its operation in this
case is phonological. The theoretically interesting issue the
Tangale data raise is whether this behavior is to be expected.
Stated differently, does the language learner posit vacuous
movement on the basis of the positive evidence provided by the
phonology? Or instead is he lead to posit the string vacuous
movement for other reasons, from which the phonological behavior
is deducible, given that the sandhi rules have a government
configuration as their domain of application? Essentially, this
is the same question we asked in (1) with regard to the surface
structure of the English <u>Who left?</u> Intensive study of the
syntax of wh--constructions in a variety of languages over the
past several years suggests that a major typological difference
between languages is whether or not wh--phrases move to Comp at
surface structure. In more concrete terms one might view this as
assigning Comp the subcategorization feature [+wh], marking a
clause as interogative. If this marking takes place at surface
structure, then a wh--word will have to appear in this position
at this point in the grammar in order for this requirement to be
to be satisfied. A language such as English accepts this option,
forcing wh--movement in the syntax, while a language such as
Chinese does not, thereby permitting wh--phrases to remain

in situ. Given that there are no other contraints ruling out the movement of a subject wh--phase to Comp, this theory strongly predicts for <u>Who left</u> string vacuous movement of <u>who</u> to Comp to yield the sur<u>face</u> structure of (1c). Clements et. <u>al</u>. (1983) give arguments to support such string--vacuous movement of wh--subjects to Comp in Icelandic and Kikuyu. We can derive some of the same results if we assume that Tangale belongs to the class of languages that stipulate a Focus position in their syntax that is distinct from Comp and that wh--elements move to this position instead of to Comp.

We have space to mention just one more parallel between the Tangale movement of wh--expressions to Focus and the English movement to Comp----the so--called superiority phenomenon (Chomsky 1981). When a wh--subject is combined with a wh--object or adjunct there is a strong preference for the subject to move to Comp instead of the object or adjunct. In this sense as well as many others the subject is superior.

(24) a. Who bought what?
      b.*What did who buy?
      c. Who slept where?
      d.*Where did who sleep?

The Tangale movement to Focus exhibits a similar pattern.

(25) a. wa pad málaf nôŋ noŋ.   'Who will buy whose hat?'
      b.*noŋ wa ˌpad málaɛ nóŋ.
      c.*wa padé malaf nôŋ noŋ.

In (25a) we see movement of the wh--subject <u>noŋ</u> 'who' to Focus in a multiple question. Failure to move the subject is ungrammatical (25b). The elision on the verb in (25a) suggests that the wh--phrase [malafá noŋ] 'whose hat' is still in object position at surface structure. The alternative pronunciation with no elision (25c) is judged odd. These data suggest that like Comp the Focus position can contain just a single element and that it must be the subject when a wh--subject is present. Note that a sentence like (25a) presents insuperable problems for the earlier analysis we entertained in which the sandhi rules of elision and delinking are blocked from applying before wh--objects. (25a) shows that they can apply in this environment----but only under the special circumstance that the sentence also contain a wh--subject. Clearly on this approach the calculation of when wh--objects do and do not block elision on the verb involves a repetition of much of the syntactic derivation. On our approach in which there is obligatory movement of wh--elements to Focus and the stipulation that the sandhi rules apply in a government domain, the paradigm in (25) presents no problem.

We conclude that the complex tonal sandhi rules to be found in many of the languages of Africa are a fertile ground in which to study the phonology--syntax interface. We hope that in some

small measure our study here will stimulate interest in pursuing this promising area of research.

NOTES

[1] See Kenstowicz & Kidda (1985), Kidda (1985), and Kenstowicz & Kidda (forthcoming) for further information on this language.

[2] The elision rule does not affect monosyllabic stems. Also, Tangale does not permit syllables with complex onsets or codas. Unsyllabifiable consonants are assigned to an anaptyctic syllable whose nucleus is u; thus /basre+mú/ ····> /basr+mú/ ····> basur-mú.

[3] There is good reason to believe that this tonal process also affects low tones but this point is rather more difficult to show. See Kenstowicz & Kidda (forthcoming) for discussion.

[4] Within the GB framework of Chomsky (1981) it would be necessary to assume that the focused element adjoins to S or S' anyway in order to provide for antecedent government of the subject trace since Tangale is not a pro-drop language.

[5] Focused objects also block the sandhi rules of elision and delinking. Thus (15c) Kay dobug Málay is not an appropriate response to (15f) Kay dobgó nón. Rather the response must be one in which the constant supplied for the variable in the question also has the same relation to the preceding verb, viz. Kay dobgó Málay, which has the force of the English "It was Malay that Kay called."

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PHONOLOGY ON THE "C-STRING"?

Chin-W. Kim

Clements & Keyser 1983 proposed that there be an auto-
segmental tier consisting solely of C's and V's. For example,
the French word héros [ero] 'hero' (beginning with the so-
called h-aspiré) is represented as follows:

$$
\begin{array}{cc}
\overset{6}{\overbrace{C \quad V}} & \overset{5}{\overbrace{C \quad V}} \\
| & | \quad | \\
e & r \quad o
\end{array}
$$
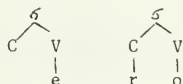
If the liaison rule is written with reference to the CV tier,
then the fact that, although le ami 'the friend' becomes
l'ami, le héros does not become *l'héros is neatly explained.
Clements & Keyser argue that such an analysis is preferable
to either an abstract analysis in which héros is posited
underlyingly as /hero/ or a concrete one in which the under-
lying form is /ero/ and a diacritic feature marks the word
as an exception to the liaison rule.

This paper examines the foundation on which the CV
theory stands. By arguing that much of the data cited in
support of the theory is historically transitory phenomena
that would predictably be relexicalized (cf. l'homme 'the
man', d'hiver 'winter', l'heure 'the hour'), it will be
claimed that CV tier cannot be built on a shifty phonolog-
ical ground.

The title of this paper is in analogy of J. S. Bach's
"Air on the G-string").

One of many advantages of the so-called CV phonology, represented
by a 1983 monograph of the same name by George N. Clements and Samuel Jay
Keyser was to provide a natural and formal way to distinguish consonant
clusters from geminates, as well as a sequence of two vowels from a long
vowel, and these in turn from complex segments such as affricates, pre-
aspirated consonants, prenasalized consonants, nasal compounds, and
diphthongs. These three classes of segments can be formally represented
as follows:

(1) a.
$$
\begin{array}{cc}
C \quad C & V \quad V \\
| \quad | & | \quad | \\
x \quad y & x \quad y
\end{array}
$$
     a C cluster   a sequence of V's

   b.
$$
\begin{array}{cc}
C \diagdown \diagup C & V \diagdown \diagup V \\
x & y
\end{array}
$$
     a geminate   a long V

   c.
$$
\begin{array}{cc}
C & V \\
\diagup \diagdown & \diagup \diagdown \\
x \quad y & x \quad y
\end{array}
$$
     a complex C   a diphthong
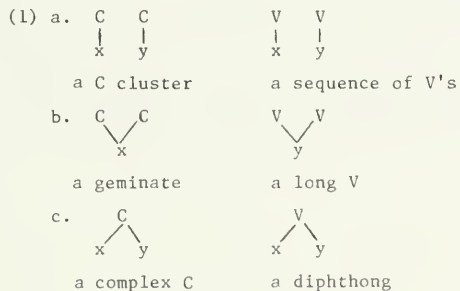
As the above illustration shows, Clements and Keyser (1983) achieve this advantage by postulating an extra tier whose elements consist entirely of C's and V's between the syllable tier and the segmental tier. Hence the name CV phonology. The cost of setting up an extra tier appears to be handsomely paid off by the advantages that the system provides in the description of what used to be seemingly intractable problems such as Arabic verbal morphology (McCarthy 1979, 1981), plural formation in Hausa and Yidin[y] (Leben 1977; Dixon 1977), reduplication in Cupeño and other languages (Levin 1983; Marantz 1982; McCarthy 1982, 1983; Moravscik 1978; Yip 1983).

One kind of evidence that is presented by Clements and Keyser in support of their CV phonology is the case of an unattached or an unassociated C element, and it is this fairly narrow area of CV phonology that I am addressing in this paper.

Let us first examine the French data and the analysis proposed by Clements and Keyser in their monograph (p. 96, p. 108). Examine the following:

(2) C-initial: le garçon 'the boy'   peti∅ garçon 'little boy'
    V-initial: l'ami 'the friend'   petit ami 'little friend'
    h-aspiré: le héros 'the hero'   peti∅ héros 'little hero'
             [ləero], *[lero]   [pətiero], *[pətitero]

Three nouns in (2) represent three classes of the French lexicon that behave differently with respect to vowel elision and consonant liaison/ truncation. As Clements and Keyser point out (pp. 109-110), there are two ways to analyze and describe the case of h-aspiré. One is what might be called an "abstract" analysis, and the other a "concrete" analysis. The abstract analysis would assume that the h-aspiré words have an underlying /h/ word-initially. This would prevent vowel elision but permit final-consonant truncation, and the language would have no exceptions to elision and truncation. The only wrinkle in this smoothly ironed fabric is that one would need to patch it up with a rule of absolute neutralization that deletes all initial /h/'s from the surface forms. But since absolute neutralization is thought to be undesirable and costly, the abstract approach is to that extent undesirable. The concrete analysis would assume that h-aspiré words are not consonant-initial words but vowel-initial words both in their phonetic form and in their underlying representation. The idiosyncratic behavior of h-aspiré words would then be accounted for by assigning them certain diacritic features that mark h-aspiré words as exceptions to the rules which they fail to undergo. The concrete approach is of course motivated by a desire to avoid excessive abstractness in underlying representations, as was initially sought by Kiparsky (1968). But that this too has a blemish is obvious. Not only would the phonology of liaison and truncation and the French lexicon become messy as they are pock-marked with diacritic features all over the place, but also it would fail to capture the fact that the set of h-aspiré words behave consistently as if they are indeed consonant-initial words with respect to all the relevant rules of French phonology.

Clements and Keyser's solution (1983:108) is to make use of the CV tier and posit (3) below as the underlying representation of the word héros.

(3)

```
      σ           σ
     /\          /\
    C  V        C  V
    |  |        |  |
    e           r  o
```
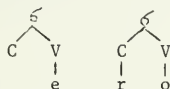
Note that there is a C element dominating no consonant on the segmental tier. Suppose now that the rules of liaison and truncation apply on the CV tier, not at the segmental level. That is, the rules will refer to the elements on the CV tier, not the segments or distinctive features at the lower tier. It is apparent that this analysis circumvents the problems or the undesirable consequences of the previous approaches, since it accounts for the phonological behavior of h-aspiré words without invoking either a rule of absolute neutralization or a set of diacritic markers. True, the unassociated C should somehow quietly disappear, but a universal convention motivated independently of the French case would presumably do the trick. So far, so good.

Let us look at one more example. In (4) below is given the Turkish data Clements and Keyser discuss as the first example of unassociated CV elements (ibid. pp. 67-69).

(4)

Nom. sg.		Dat.	3sg. Poss.	2 pl. Poss.
oda	'room'	oda-ya	oda-sɨ	oda-nɨz
sap	'stalk'	sap-a	sap-ɨ	sap-ɨnɨz
bina:	'building'	bina:-ya	bina:-sɨ	bina:-nɨz
da:	'mountain'	da-a	da-ɨ	da-ɨnɨz

The first two words in (4), oda 'room' and sap 'stalk', represent two classes of Turkish nouns, one the vowel-final and the other the consonant-final stems, that determine the kind of suffixes that they may take. The declension of the third word, bina: 'building', shows that long and short vowels behave exactly alike with respect to affixation. The problem is the declension of the third class of words represented by the last word in (4), namely, da: 'mountain'. Despite the fact that it rhymes with bina: in the Nominative singular, it behaves as if it rhymes with sap, that is, as if it is a consonant-final noun, with respect to affixation.

Again, the same two paths are open, abstract and concrete, leading to the same dead-ends of absolute neutralization and diacritic features that we encountered in the French trails of liaison and truncation of h-aspiré words. Again, a graceful exit from this dead-end street is to be found in the unattached C element, as shown in (5) below (ibid. pp. 70-71).

(5) a.

```
        σ
       /|\
      C V  C
      | |
      d a        [da:]  Nom.
```

b.
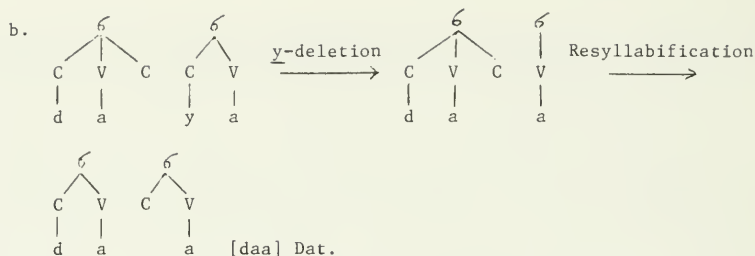
In (5a), the long vowel in the Nominative is the result of two elements on the CV tier being linked to one segment, à la (1b). In (5b), since da: 'mountain' ends in a C-element on the CV tier, it triggers the rule deleting the initial consonant y of the Dative suffix ya. The output of this rule is then resyllabified and the unattached onset C deletes to give [daa]. Note that this analysis regularizes the declensional pattern of da: class nouns without any patch-ups, and that it has the additional quite un-beatable-looking advantage of providing a natural explanation for two different pronunciations of Nominative [da:] and Dative [daa]. The former has a simple long vowel, while the latter is said to involve "vowel re-articulation: a mode of production in which the vowel is uttered with two intensity peaks" (ibid. p. 72), perhaps as a sequence of two syllables à la the distinction in English between reem [ri:m] and reim(burse) [riim-].

Clements and Keyser's proposed solution appears to be quite insightful, substantive, and palatable. So, where is the fat in the beef?

My quibble with their analysis is not so much with the use of the CV format to account for the thorny phonological phenomena in French and Turkish as with the presentation of the cited data as the foundation on which the CV theory stands. Examine the following French words:

(6) habiter   'inhabit'   (<L. habitare)
    hériter   'inherit'   (<L. hareditare)
    hiver   'winter'   (<L. hibernus)
    homme   'man, human'   (<L. hominus)
    heure   'hour'   (<L. hora)
    harmonie 'harmony'   (<G. harmonia)
    hépatite 'hepatitis'   (<G. hēpar)

The above words are not h-aspiré but h-muet words in modern French. They are underlyingly vowel-initial as such forms as l'homme 'the man', d'hiver 'of winter', l'heure 'the hour', etc. show, where vowel elision occurs. What this set of words shows is that historically they were h-initial words which are now relexicalized as vowel-initial words. Whatever led the original h-initial words in Latin and Greek to the division of two classes in French, h-aspiré and h-muet, it is perhaps not too unreasonable to predict that the current h-aspiré words will also become relexicalized into underlyingly V-initial words, as the h-muet words exemplified in (6) have apparently been. A small indication that such a process is taking place can be seen in such expressions as l'héroine 'the heroin',

les haricots verts [lezariko ..] 'French beans', mordre à l'hameçon 'to
take the bait' (this last one is C and K's own example, p. 112). Purists
may still insist on [le ariko ..], but the liaisoned form appears more
and more often in children as well as in many adults.

If this is the case, then it can be said that the current phonological
phenomenon in French in which h-aspiré words behave as if they are C-
initial words is merely a transitory phenomenon, destined to be relexicalized
as V-initial words sometime in the future (cf. Klausenburger 1978).

One can perhaps predict the same in the Turkish case, i.e., that the
class of words represented by da: will eventually be relexicalized as
V-final nouns, if only to minimize the exceptions and the burden of
language learners. That the da: phenomenon is a historical product in
Turkish too is seen in the Clements and Keyser's own remark (p. 68, fn. 6)
which is worth quoting here:

(7) "Historically the nouns in question ended in the voiced velar
fricative known as yumuşak ge (orthographically, ğ), which has
been entirely lost in standard Turkish, although reflexes of
these consonants survive as velar glides in some non-standard
dialects."

Korean provides similar historical data, an examination of which
will be instructive.

In middle Korean (15-17th c.), a voiced velar stop g was weakened
to a fricative γ after a sonorant, and then eventually disappeared, e.g.,

(8) mol-gɛ --→ mol-γɛ --→ mol-ɛ 'sand'
    nal-gɛ --→ nal-γɛ --→ nal-ɛ 'wing'
    nol-gi --→ nol-γi --→ nol-i 'game, play'

An examination of the orthographic conventions at the time indicates that
even after a complete disappearance of g, these words were pronounced as
given in the final derivation in (8). In contrast, the pronunciation in
modern Korean is [morɛ], [nori], etc., in accordance with the very preva-
lent intervocalic or syllable-initial l to r rule, e.g., tal 'moon', but
tal-i [tari] 'moon' (Nom). The Korean script called Hangul, though alpha-
betic, is written in syllable blocks. In Middle Korean, an affix-initial
vowel following a stem-final consonant formed a syllable with this conso-
nant, and thus, tal-i was syllabified as ta$li, where $ indicates a
syllable boundary, and was transcribed as such. The words in (8), however,
were exceptions. They were consistently transcribed as mol$ɛ, nol$i,
etc., indicating that they were not pronounced [morɛ], [nori], etc. as
in modern Korean, but as [mol.ɛ], [nol.i], etc. (See Kim and Toh 1980
for details.)

The two pronunciations can be neatly accounted for in terms of the
CV framework as in the following:

(9)

```
      σ              σ                      σ              σ
    ╱ ↑            ╱ ╲       g-del.       ╱ ↑            ╱ ╲       C-del.
   C  V  C       C  V     ────────→     C  V  C       C  V     ────────→
   |  |  |       |  |                   |  |  |          |
   m  o  l       g  ε                   m  o  l          ε


      σ        σ                           σ              σ
    ╱ ↑ ╲      |      Resyll.&           ╱ ↑            ╱ ╲
   C  V  C     V    ────────────→       C  V  C       C  V
   |  |  |     |      l → r rule         |  |  |       |  |
   m  o  l     ε                         m  o  r       ε
```

With the deletion of g but with the syllable-boundary still between l and
ε, the pronunciation would be [molε], but with the resyllabification it
becomes [morε]. What is to be noted here is that the unattached C element
was in such an unstable state that it soon disappeared from the language
altogether (despite the fact that it created a homonymy with an already
existing morε 'the day after tomorrow'). That is, not only g was deleted,
with it went the C element to which g was originally attached, indicating
that an unattached C is an unstable, unnatural, and therefore, historically
transitory phenomenon.

Another example from Korean. Korean has what is called a "diagonal"
vowel harmony, so called because the line dividing the two harmonic
classes runs diagonally in the vowel chart, as shown in (10):

(10)   i   ɨ   u
                                ⟋
         e   ə   ⟋   o
                    ⟋
                 a

This kind of system of vowel harmony is quite unusual, and one might even
say unnatural, and was a topic of extensive discussion in the past from
Aoki (1966) to Zwicky (1970).

As far as the Korean case is concerned, there is a simple historical
explanation. Namely, there was a clockwise vowel shift in non-front
vowels in the 13th-14th c. One can recover the original state by shifting
the non-front vowels one position counter-clockwise from the vowel chart
of Modern Korean, as is shown below:

(11)   i   ɨ ←── u   i   u ┊ o
                  ↓   ↑   ┊
         e   ə   o   (e)   ɨ ┊ (ɔ)
                  ↓   ┊
                  a ──→   ə ┊ a

         Modern Korean   Early Korean reconstructed

Strikingly, the reconstructed vowel system displays a quite natural and
straightforward vertical harmony in which the pairs of harmonically
opposed vowels are of the same tongue height. (ɔ is an extinct vowel

which used to be the "light" counterpart of "dark" <u>ɨ</u>. <u>e</u> is a later de-
velopment. See Kim 1978 for details.)

What is interesting and important to note is the fact that vowel
harmony in Modern Korean is rapidly disappearing, primarily and precisely
due to the unnaturalness of the diagonal division of the harmonic classes.
In the present-day Korean, vowel harmony is barely kept alive between the
last vowel of the verb stem and the first vowel of the following affix,
and in the words of sound symbolism. Some examples are given in (12).

(12) mak-<u>a</u>   'to block'   tɨr-<u>ə</u>   'to hear'
      mək-<u>ə</u>   'to eat'   ·   miw-<u>ə</u>   'to hate'

      po-<u>a</u>   'to see'   me-<u>ə</u>   'to clog'
      pu-<u>ə</u>   'to pour'

      sɨlc'<u>ə</u>l 'furtively'   chull<u>ə</u>ng (a movement of big waves)
      salc'<u>a</u>k 'stealthily'   choll<u>a</u>ng (a movement of small waves)

If vowel harmony is doomed to disappear from Korean, and all indications
are that it is, then it is because diagonal vowel harmony is a skewed
and highly unnatural system, therefore making it a merely transitory
phenomenon. From this point of view, diagonal vowel harmony does not
have much of a status in the theory of vowel harmony. If one were to
build a theory of vowel harmony on the diagonal system, the theory
would be as durable and transient as the life-span of the diagonal
vowel harmony. So it would seem with the unattached empty C's.

I am aware that CV phonology has other virtues, e.g., its ability
to account for compensatory lengthening in an insightful way (cf. Steriade
1982), and that Clements and Keyser go on to show in the final chapters
of their monograph that reference to the CV tier enables elimination of
apparent violation of strict cycle condition in Klamath. I am also aware
that "transitory" is not a precisely defined term, and that there is no
way to tell how much duration can be termed "transitory" as opposed to
"permanent" in the evolutionary clock of language which, after all,
changes constantly. But as far as the unattached C node is concerned,
exemplified by the French and Turkish data, the force of argument appears
to recede, as learnability of such a node also recedes with the ebbing
of the child's memory and capacity for handling highly irregular and un-
natural linguistic phenomena such as diagonal vowel harmony and unattached
C elements.

In conclusion then, can we not say that a theory based on transitory
data and skewed systems will also be to that extent transitory, and that
the CV tier cannot be built on a shifty phonological ground?

Orchestral Suite No. 3 by Johann Sebastian Bach contains a lovely
tune popularly known as "the air on the G-string." If we, for a brief
moment, liken phonology to a string instrument, does phonology have a
"C-note string"? If it does, what tunes can it play and how long? I
would venture to say, not very lovely tunes and unlikely very long,
probably or rather precisely because the string is unstable and untunable
as it is attached in the neck but is unattached in the bridge.

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MISSING NOMINALS, NON-SPECIFICITY AND RELATED MATTERS,

WITH ESPECIAL REFERENCE TO THAI AND BURMESE

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(with Namtip Pingkarawat)

We shall show that 'zero' pronouns in these languages require
a radical revision of 'Empty Category Theory', in the framework of
Government & Binding Theory. The fact that 'zero' pronouns can
occur in object and other non-subject positions (and in finite
verb phrase clauses, and in a language essentially without verb-
subject agreement) and other, more involved evidence, make it
clear that these languages are not pro-drop languages, in spite of
the free occurence of null subjects. In the final analysis, it
will be shown that all these empty pronominals have the essential
properties of non-specific pronouns (like 'one' in English, on in
French, man in German), rather like the variable-like entity
called PRO-Arb in Government & Binding Theory. The rules for
assigning an arbitrary pro-nominal more specific reference in the
context of controlling and/or governing antecedents turn out to
be motivated by very general considerations. It becomes clear
that empty pronominals generally, i.e., in the case of languages
like English and the Pro-drop languages considered in Government
& Binding Theory, all reduce to simply this non-specific empty
pronoun, and this is shown to simplify and improve Empty Category
theory in general. This is worked out in the context of quanti-
fication theory that permits one to assign non-specific nominal
expressions disjoint referential indices ranging over the entire
cardinality of sets. The rules for assigning more specific ref-
erence in these cases is seen to be a particular instance of
independently needed conventions for resolving disjuncts, needed
for instance in a proper theory of the logical representation
of questions.

We then go on to show some of the useful consequences of this
view for the syntax of Thai, by using it to demonstrate the
existence of both S and S' complement clauses, which is seen to
resolve several problems in the distribution of zero pronouns,
overt pronouns and 'reflexives' in Thai.

It is well known that languages such as Thai and Burmese, for instance,
more or less freely omit overt pronouns. Moreover, these zero-form pronouns
(see Aporn Surintramont 1979 for the demonstration that these are not the
consequence of deletion) occur not only in subject position in their
clauses, but also in other positions, in particular, in direct object posi-
tions. This indicates, as do other facts to be mentioned, that these zero
pronominals fall outside the scope of current versions of the theory of
Empty Categories in current Government & Binding Theories of syntax (Chomsky
1981, 1982), and in fact in all existing clearly formulated syntactic
theories. It is our intention in this paper to reformulate the theory of
empty categories in such a way as to handle the facts of the languages in

question, and in such a way that the theory will also handle more perspi-
cuously the facts (chiefly from European languages and English) that Empty
Category theory is set up to handle and also resolve certain apparent infe-
licities in the current theory. The essential assumption for the present
work is that of Lehman (1985) on algebraic approaches to quantification,
namely, that reference amounts to quantification over cardinally indexed
intensionally defined sets, so that, in particular, specific reference means
assigning an algebraic-numerical index to a term. For instance, the
(indefinite) specific noun phrase a boy (as in A boy spoke to me yesterday)
clearly refers to a particular ith boy selected out of the (perhaps
arbitrarily ordered) set of all boys (of some cardinality N). More par-
ticularly still, this sort of thing makes it possible to assign referen-
tiality to non-specific noun phrases, namely, in the case of such an
expression as a book (as in I want a book), a disjoint (Booleanly disjoint)
index amounting to, in the example to hand, the arbitrary ith or jth book,
with the quantities i and j ranging disjointly from 1 to N (N, the car-
dinality of the set of books). This has numerous essential advantages of
which I need mention just one: we know that non-specific noun phrases can
be antecedents of ordinary pronouns and thus that the pronouns are core-
ferential with (take their reference from) these antecedents. This sort of
situation is known to cause all sorts of intractable problems for the usual
(Fregean) theories of quantification and reference, since in those theories
non-specific expressions must be said to be non-refering. With this kind of
motivation in mind no further technicalities of the general theory need be
mentioned in this paper. The notation that will be employed will now be
transparent. Quantifying over algabraic indices rather than over Fregean
variables, (specific) a boy of the first example above is

1. $\exists\ i\colon X_i \in \{BOY\}$

and a book of the second (non-specific) example above is

2. $i \vee j\colon X_{(i \vee j)}\ \{BOOK\}$, where the index is equal to $\cup$ $(1,2,\ldots N)$
     minus $\cap$ $(1,2,\ldots N)$

In languages like English zero elements are supposed currently to be of
two kinds: traces of the leftward movement of topicalised, relativised or
questioned noun phrases out of their propositional argument positions, i.e.,
the gaps in

3.   John, I know _____ .
    Whom do you see _____ ?
    The dog that I killed _____ .

(called in Government & Binding theory (hereinafter G&B) variable or e) and
the empty subjects of complement clauses with infinitive predicates, as in

4.   I promised John _____ to do it.
    I want _____ to go there.
    He is easy _____ to fool.
    He is eager _____ to compete.

We shall have nothing to say about the trace/variable e , supposedly a free
Fregean variable bound by the overt element in COMPlementiser position on

the left (the wh-word or the topic noun), especially in view of the lack of any evidence of any movement rules in these languages (for Thai see Wongbiasaj 1980). The second kind of gap and its relatives will be the subject of this paper, however.

The empty subjects of English and languages like it illustrated in (4) are known in G&B as PRO. PRO is said to be like both a pronominal and an anaphor. That is, like a true pronoun, it is freely able to have an antecedent outside its proper clause, whilst, like true anaphors, such as each other or reflexives like himself, it can never have independent specific reference; the verb of the encompassing clause in every case either determines which of its arguments must be antecedent of the gap PRO, or else ensures, as in the third sentence of (4) above, that subject PRO will have only non-specific reference (in fact, the sentence means that he is easy for anyone at all to please, viz., for one to please). Since, in G&B, subjects are said to be governed by their verbs (actually, in many languages overtly, by the INFLexional/AGReement elements associated with the verb), e.g., assigned grammatical case by the verb with its finite grammatical feature markings overt or non-overt, they are said to be free in their governing category. That is, a subject's proper clause, S, being the category containing INF/AGR, nothing in that clause can determine interpretation of the subject's reference. Thus, if the subject be a pronoun, its antecedent, if any, must be outside the clause and, indeed, may be anything of appropriate person, number and gender either in encompassing clauses, in the general discourse or whatever. On the other hand, anaphors are governed by verbs when they are direct objects, by prepositions in prepositional phrases, by complementizers or by matrix clause verbs when they are subjects. In particular, if we consider direct object anaphors, assigned case by their (transitive) verbs, or anaphors that are objects of prepositions, or, indeed, anaphors that are subjects of embedded clauses and hence governed by complementisers or matrix clause verbs, in each instance the Governing Category has to be, by the arguments of G&B, the minimal S (or minimal NP, but we may ignore this for our purposes) containing the governor. Thus, once again, the governing category is S, and an anaphor is said to be bound therein, i.e., its antecedent must exist in that S. For instance, in

5. They saw each other.

there is only the single clause, and its subject binds the object-anaphor each other. In

6. They want each other to win.

each other must be governed by the upstairs verb, want (or complementizer--see below), and its minimal containing S must then be the governing category of each other, within which S, of course, its subject they necessarily binds the anaphor in question.

Subject PRO, then, must, on the current theory, lack a governing category, in order to escape the contradictory requirement that, being what the theory calls a pronominal anaphor ([+pronominal, + anaphor]), it be both bound and free in its governing category. This is held to be the reason why PRO, in these languages, must be only the subject of a non-finite clause. For, such clauses, lacking INFL/AGR, that is, lacking a governor for the subject, cannot be taken as governing category for that subject. However,

at this point, it appears to us, a difficulty, possibly an incoherency, in the theory arises.

If the analysis of (6) is correct, and it has to be within the terms of the G&B theory here being considered, then subject PRO ought after all to have a governing category, namely the higher clause, S, containing it and its governor, be the latter matrix clause verb or a (covert) complementiser of the same type as overt for (cf., dialectal I want for to go.). But, in that case, the contradiction is not escaped, since PRO in the first, second and fourth examples of (4) are obliged to have an antecedent in the matrix clause, as determined by the controlling matrix verb, whilst, in the third example in (4), the PRO subject has no specific reference whatever. In fact, of course, this apparent incoherency appears resolvable. Without INFL/AGR, there is nothing in the downstairs clause to assign case and the like to the subject, so its own clause, S, is not a governing category for the sujbect. Moreover, unlike an (overt) anaphor, there is nothing overt in PRO to assign case to, and hence even the upstairs verb or the possible complementiser is not effectually a governor of the PRO subject, which then still (in that sense) lacks a governing category. Its antecedent, if any, is then said to be assigned by the theory of Control. That is, the matrix clause verb's idiosyncratic properties constrain this assignment, rather than syntactical Government. This, however, seems to be a somewhat forced way out of the problem at best, and it is managed only by means of equivocating over the expression 'no specific independent reference' in the definition of anaphor-like properties of PRO-arbitrary (case c of 4, above). Anaphors, overt more or less by definition, cannot have any independent reference whatever, specific or not, and, on a proper theory of quantification, non-specific reference is well defined as reference, so that PRO-arb, unlike any anaphor, can indeed take independent reference. We shall return later on to this general problem, contenting ourselves for the moment with pointing our that there is something at least highly suspect in defining PRO as both free and bound in its governing category and then trying to escape the contradiction by arguing that it must have no governing category. But, in that case, then perhaps Chomsky (1982:78ff) is wrong to define PRO as [+pronominal, + anaphor], wrong in fact to try to define these two features as orthogonal to one another. Perhaps it must be the case that the two cannot both be [+], so that we can only have true pronouns [+pronominal, -anaphor], true anaphors [-pronominal, +anaphor] and R-expressions, that is pure referring expressions, ordinary lexical nouns an names [-pronominal, -anaphor]. If so, the question remains where does an empty category like PRO fall in the classification? Clearly it is not an R-expression. If the proposed theory of reference and quantification is right, then it is also not an anaphor. On the same theory, its non-specific instances (PRO-arb) are referential even though non-specific; that is, PRO-arb is not, as Chomsky (1982) claims, variable-like (in the Fregean sense of a free variable, viz., non-referring. But then, in turn, PRO-arb is simply pronominal.

PRO can be seen now as essentially, like all pronominals, free in its governing category. The control cases (so-called control-PRO, cases a,b,d in (4)) have interesting parallels in the case of overt pronouns, for example:

7. He will be good to do that work.

is clearly understood to mean that

8. He will be good as <u>someone</u> to do that work.

In both cases, it seems evident that someone or other (non-specific, and an overt pronoun, however quantified) is being sought for the job of work, and that <u>good</u> (in (7), at least, a controller of PRO subject of <u>to do</u> making PRO coreferential with matrix subject <u>He</u>) serves to impose a specific interpretation, that of <u>He</u> upon the non-specific Pro-arb/<u>someone</u>. In fact, what happens in this case seems to be that control serves to 'resolve' the disjunct specification that defines non-specificity, a point we shall subsequently rely upon considerably. Moroever, perhaps even more tellingly, there are perfectly obvious overt pronouns with the non-specific properties of PRO-arb, namely English <u>one</u>, German <u>man</u>, French <u>on</u> and the like. Indeed, in finite complement clauses the parallel is especially striking. For, where the non-finite complement has PRO, as in

9. He told me <u>PRO</u> to go.

the finite complement can have either a specific overt subject matching the upstairs coreferent established by control or <u>one</u> (the parallel French examples with <u>on</u> are perhaps even more persuasive), as in

10. He told me that <u>I/one</u> should go.

Here, note that, pragmatically at least, <u>one</u> is generally understood as at least including -- in some sense preeminently and paradigmatically -- 'me'. We shall not pursue this interesting but problematical issue in this paper, but it is perhaps worthwhile pointing out that the present theory of Empty Categories is able to deal as it does with PRO only because it omits considering pronouns other than the most ordinary ones like <u>he</u>, <u>she</u>, <u>it</u>, <u>I</u>, <u>we</u>, <u>you</u> and <u>they</u>.

G&B considers another kind of empty category, namely, the zero subjects that one finds commonly in languages, Italian for instance, where the verb itself is marked (with an overt reflex of INFL-/AGR) for the person and number of the subject -- the so-called pro-drop languages. Here, the gap in subject noun phrase position is licensed by the presence of a rich AGReement-INFlexional system of additions to the verb that preserve information about the person and number (at least) of the missing subject. The empty subject in this case is said (Chomsky 1982) to be <u>pro</u>, and as it occurs more or less freely in finite clauses with this rich AGR system that governs the subject, pro, unlike PRO, is said to be free in its governing category and thus an ordinary (though empty) pronominal, viz., a true zero pronoun. It appears, at least, always to require a specific antecedent (by pragmagic discourse presuppositions or by syntactic rules linking it with a noun phrase in a higher clause). The idea that its referent must be inherently specific may be illusory, however.

If INFL indicates first or second person, then of course the referent is specific. But if it indicates third person, then it need not be specific; indeed, the claim that it must be seems to follow from omitting to consider that such quite ordinary lexical pronouns as English <u>one</u>, whilst third person morphologically, are in fact non-specific referentially. This, however, makes pro identical to PRO-arb, viz., an arbitrary, i.e., non-specific pronominal (indeed, pronoun), and its non-specificity (disjoint referential index

ranging over a whole named class) turns out to be what underlies Chomsky's
calling it (1982:85) variable-like. Furthermore, even the requirement that
pro have, or somehow acquire, a specific referential interpretation may be
nothing more than a perhaps universal tendency to resolve, as it were, a
non-specific disjoint indexing -- a matter we shall revert to later on. In
any event, it is not surprising that such an element should be capable of
acquiring a specific interpretation, in view of the fact that, in English,
one, and, in French, on often are used (stylistically?) to make oblique
reference to specific first, second or third person. In fact it should be
all the less astonishing when one considers that the indexing of a non-
specific element, ranging as it does in the present theory over all persons
(or members of whatever set or class), subsumes all specific interpreta-
tions.

If the foregoing argument is even roughly correct, then there would
appear to be a convention of the following kind: if a language have a gover-
nor of a subject NP that is marked for things like person and number (and
perhaps in some sense case -- AGR/INFL), then either (the pro-drop case)
zero subjects can only appear when such information is recoverable from the
governor, i.e., can appear freely, since in non-finite clauses the governor
is absent (PRO exists in pro-drop languages, after all) and in finite
clauses the information is always recoverable; or else (English and similar
languages), if the governor only provides this information incompletely
(English distinguishes only third-singular in the morphology of the verb),
then zero subjects can only appear when the problem of (imperfect) recovera-
bility cannot arise, viz., in non-finite clauses. The matter has to be
stated this way, i.e., for zero subjects only, because, contrary to the
assumptions of current theory, we wish to claim that, in English for
instance, empty pronouns do in fact occur in other than subject position,
though under severe restrictions as yet poorly understood. That is, we do
find, in English (and European languages both pro-drop and other), for
instance, empty direct objects, as in the case of the so-called optionally
transitive verbs like eat or sing (interpretation: eat something or other,
sing something or other -- the direct object being understood
nonspecifically).

Thus, it is languages like English, with its especially strong restric-
tion on the occurence of empty subjects only in non-finite clauses, that is,
only in the absence of a governing category, within its own clause or abso-
lutely, that are exceptional, or highly marked. There is nothing in pro/PRO
that inherently necessitates it's appearing only in ungoverned positions,
and in fact it does, to the limited extent of zero direct objects in these
languages, appear in governed positions. And in languages like Thai or
Burmese, with either no overt verbal INFLexional system or, as in Burmese, a
system of verbal desinences that are concerned only with things like mode
and aspect and having nothing to do with INFL/AGR marking of subject
person/number agreement, there are no such restrictions upon the appearance
of non-trace empty nominals -- or at least no restrictions having to do with
government. These languages, we think, may be the unmarked ones in this
respect. Zero pronominals appear quite freely in most positions in these
languages, even in main clauses and simplex sentences, with the trivial
exception that, since Thai prepositions (of which there are very few) and
Burmese postpositions (of which there are not many, perhaps) cannot be
stranded, so that it remains unclear for the moment whether empty pronominals

occur in these (non-argument) positions but without their governing pre-/postpositions.

We shall, from this point on, refer to non-trace empty pronominals, then, as simply PRO, with the understanding that it is always PRO-arb, a variable-like, non-specific pronoun. In control contexts in non-finite subordinate clauses, the non-specificity is resolved into a specific referential index by coindexing with a specific 'antecedent' in a matrix clause, having regard to empty subjects at least. In pro-drop languages this resolution takes place if AGR marks first or second person, though in the case of third person agreement (morphologically specific or even morphologically definite, no doubt) the strain towards trying to resolve the disjunction/non-specificity (probably a universal of some kind) is managed by means of non-syntactic pragmatic-discourse considerations, often equivocally at best, so that, for example, Italian _parla_, systematically rendered by Chomsky (1982:79 ff.) in his treatment of the pro-drop phenomenon as _he is speaking_ (the ending is third singular and there is no overt subject), is in many instances just as well translated into English as _one is speaking_, e.g., when there is no discourse context providing mentioned or presupposed persons amongst whom one might seek a particular 'antecedent.'

In this connexion it seems to us that resolution of disjoint non-specificity has to take place by some means other than what is ordinarily understood by coindexing. For ordinary coindexing seems to be defined in terms of Fregean quantification, where a so-called free variable (trace, e, would be a real case) that, by definition, simply has no referentiality, acquires a referential index from an element that binds it. But if PRO has an inherent disjoint referential index (iUj $U(1,2,...,N)$), then its specific resolution has to be arrived at not by changing its referential index (by brute force, so to say) to an entirely different one -- that of its controller-antecedent, but rather by setting its inherent index equal to (not identical with) that of its controller (iUj = some particular k $(1,2,...,N)$). This, but not the brute force method, makes algebraic sense. This means, moreover, seems likely to provide, independently, a proper account of true reflexives. That is, we must ask why it is that, quite generally in languages, a direct object understood as having the same empirical referent as a subject (we need pay no attention here to reflexivity of other non-subject positions) always takes a special, distinctive shape, a shape, moreover, that often if not invariably, makes use of a form that otherwise turns out to mean something like _self_ or _body_, a noun in its own right. What seems to go on in such cases is that there is an inherent expectation that transitive actions affect patients distinct from agents, so that objects may be expected to be distinct from subjects, in which case the object is required to have a reference distinct from that of the subject noun phrase. Then what reflexivity amount to is the obligatory setting of the index of the object = to (but not with) the index of the subject. This, at all events, seems to be what has to be postulated for the way control works for the specific referentiality of control-PRO, as in the first, second and fourth examples in (4), above, and hence PRO-arb is just the limiting case of PRO, i.e., PRO where, without control-context, no resolution of non-specificity is imposed on the empty subject.

With all this we can conclude that there are only, after all, three kinds of nominals: R-expressions ([- anaphor, - pronominal]), anaphors

([+ anaphor, - pronominal]) and pronouns ([- anaphor, + pronominal]) inclu-
sive of PRO/pro; true free variables (e/trace) ought, on this analysis, to
be unmarked for these features until bound. Perhaps, when bound, a free
variable takes the marking for these features of the binder: that of
(non-specific) pronominals when bound (in surface structure or in Logical
Form -- see Davison 1984 for evidence that even in languages without syntac-
tic wh-movement for questions and/or relativisation the LF representation
involves something very like the binding of a variable by wh-in-
complementiser-position) by a wh-word -- words which quite generally also
serve as non-specific pronouns; and that of nouns/R-expressions when bound
by, say, a topicalised or other moved noun (as in (3)). We shall return to
this last point subsequently. Anyhow, with these revisions in the theory of
Empty Categories, we eliminate the need for any realisation of [+ pronomi-
nal, + anaphor], with all the contradictions and awkwardness that any such
category would have to entail, as shown earlier on.

As for the heavy restrictions in languages like English on PRO in direct
object and other non-subject positions, no doubt this has a lot to do with a
language particular strong tendency to require overt case marking, and it is
certainly not owing, as G&B claims, to any similarity to anaphors (the
Specified Subject and/or Nominative Island Conditions restricting trans-
parent anaphors to same-clause antecedents). That is, whilst

11.   *John and Mary asked Bill to like each other.

seems to be blocked by the presence of a fully specified subject in the
downstairs clause, whilst

12.   *John asked Bill to like PRO.

must be blocked by some other condition, no doubt the condition suggested
immediately above, in as much as in many languages PRO is allowed freely in
such contexts, though not an anaphor -- e.g., Burmese.

Now, it ought to be clear that there is no way to keep the foregoing
argument from applying in the same way to PRO complement subjects, in which
case it can no longer be accepted that PRO escapes having a governing cate-
gory, and this, in turn, destroys the basis for claiming that PRO is both
pronominal and anaphoric. Furthermore, the supposed similarity (in some
sense distributional) between PRO and anaphors is largely illusory. For, it
is Government and the theory of Binding that, in these instances coindexes a
complement subject anaphor with its matrix clause subject, but Control that
assigns control-PRO its antecedent, whether or not the latter is the matrix
clause subject.[1]

If a complement subject be an anaphor, as in (6), since an anaphor can-
not be free in its governing category, it must lack a governor in its own
minimal clause (because the complement clause has to be non-finite).
Moreover, in cases such as (6), the upstairs verb (want) cannot be the gov-
ernor of the anaphor, since want takes S' complements, and so cannot assign
(oblique) case to the complements subject, although (see below on
Exceptional Case Marking) a matrix verb such as English believe seems to
take S complements and hence to assign case to its complements subjects
(cf., for at least some speakers, They want for each other to win. vs.

*They believe for each other to be enemies.) So, for other than Exceptional
Case Marking matrix verbs, we have to assume that a preposition-like comple-
mentizer in COMP (e.g., the for complementizer in the dialect form above) is
the case-marker/governor for the complement subject in question. In any
event, be it the matrix verb or a complementizer, the assumption that some
such elements in the matrix clause governs the complement subject is relati-
vely uncontroversial. The matrix S clearly is the minimal S containing both
such a governor and the governed complement subject and containing a SUBJECT
(in the sense of Chomsky 1981:211 ff. -- essentially AGR/INFL) accessible
(idem) to the governed complement subject. The anaphor complement subject,
then, has a governing category to be bound in, as required.

    (13)   maung kyi: [maung la? cai? lou.] sei-hcin-te
           (name)   (name) PRO like COMP let want
           Maung Gyi wants Maung Lat to like PRO

which is wholly acceptable, and where PRO can mean either Maung Gyi, the
upstairs subject, or any one or other person or persons motivated by pragma-
tic or discourse considerations.

    Now, as we have seen, languages vary considerably in the restrictions
they impose upon the structures in which PRO may appear. They also differ
in the matter of what structures containing PRO are treated as control con-
texts, requiring PRO to acquire a specific resolution. Thus, consider
Burmese and Thai. Both lack any kind of sentential coordinate conjunction,
and have for conjunction of sentences only participial subordinate conjunc-
tion. PRO in the following examples is the subject of the second, therefore
main, clause, the participial clause being almost certainly in COMP as is
the case with topic clauses in these languages (for Thai in particular, see
Wongbiasaj 1980). Yet Thai treats the sentential conjunction as a control
context for PRO and Burmese does not. Thus, in Burmese,

    (14)   u: maung maung ka. u: win: maung kou
           (name)   subj. (name)   obj.
           yai? pi: PRO thei-te
           hit perfective die non-fut.

           U Maung Maung hit U Win Maung and PRO died.
           U Maung Maung having hit U Win Maung, PRO died.

Here, PRO may refer to either U Maung Maung or U Win Maung or, indeed,
anyone else one may have been speaking about. It is well known that this is
a cause of serious potential ambiguity (on this and missing pronouns in
general, see Pe Maung Tin 1956, especially 199 ff.). But in Thai,

    (15)   phim tii nuan lɛɛ w PRO taaj
           Phim hit Nuan perf.   die
           Phim hit Nuan and PRO died.
           Phim having hit Nuan, PRO died.

in the self same sentence, PRO must refer to Phim, the subject of the main
clause. This has got to be a case of control, since it cannot fall under
government. For, if indeed the participial clause is in COMP, then there is
no S or NP that contains both the PRO and any possible governor in the

participial clause; only S' contains both, and being a maximal projection (Chomsky 1982: 19) protects PRO against any such governor, even though the absence of anything like INFlexion on the Thai main verb makes its claim to govern PRO weak in some sense. The problem is, as we see it now, that this has to be a case of control over a main clause subject by something (presumably the perfective participial verb) in a non-main clause. We have nothing to say about this at the present time. In any event, it appears that this structure assigns PRO the reading of the preceding subject; if PRO be replaced by the ordinary third singular pronoun, kháw, however, the reference can be to just about anybody, including, prominently, Nuan.

15'

```
                        S'
                      /    \
                   /          \
                COMP            S
                 / \           / \
                S   \         /   \
               / \   \       /     \
         phim tii nuan     PRO     taaj
              léɛw
```
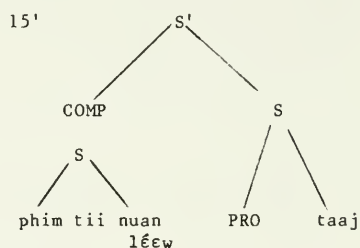
In pursuit, then, of the ways in which languages establish control contexts for PRO (subject PRO particularly), and the way PRO subjects in complement clauses can be governed by verbs in matrix clauses, let us go on to look at some facts about types of verbs of thinking and saying and their complements in Thai.

Note first, however, that English has what is called Exceptional Case Marking (Chomsky 1982:19). Certain verbs, such as believe, take non-finite complement clauses as S rather than S', so that the complement subject is directly in the government-cum-case-marking scope of the higher verb, and although, say, a third person pronoun downstairs subject is oblique, one cannot postulate the presence of a complementiser as the governor of that subject, since, unlike the cases we have earlier examined, such as complements of the higher verb want, the complementiser for cannot be present even in dialectal variants: want (for) John to go, but believe *(for) him to be silly. PRO is, however, disallowed as the downstairs subject in these cases in English, no doubt because of idiosyncratic English constraints on PRO's having a lexical governor or being liable to case-marking.

Thai, too, seems, as we shall see, to have Exceptional Case Marking verbs with S rather than S' complements, but, as otherwise in Thai, PRO is allowed as the subject of the complement and appears to be governed by it, but without constituting a control-like context for PRO's specific resolution. Now Thai (see page 6, above) is particularly interesting in this connexion precisely because it lacks any semblance of overt INF/AGR, with the concomitant that there is no obvious distinction between finite and non-finite (complement) clauses. Let us then suppose that a subject is only trivially (ineffectually) governed in its proper clause, although a verb fully governs (properly governs, extending that G & B notion to cover

the present distinction) its direct object and subjects of S-complements
directly subjacent to it -- Thai being SVO in word order and its comple-
ments being post-verbal. A Thai Exceptional Case Marking verb governs the
subject of its complement. There will be, then, no motivation for the
aforementioned constraint of English, and Exceptional Case Marking verbs
will be able to govern PRO complement subject in Thai. In fact, since verbs
govern following noun phrases in their immediate scope, it makes no dif-
ference whether the complement clause be considered finite or non-finite;
indeed, all these complement clauses can take certain markers of mode and/or
aspect (for these see particularly Sereechareonsatit 1984).

Thai verbs of thinking and saying seem often to come in pairs with
closely related meanings, or at least nearly identical conventional English
glosses, but with quite different properties, in particular as to the
possibilities for construing possible antecedents of the pronominal sub-
jects of their complements. Thus,

> (16) chǎn khít wâa nuan cà? maa
>   I think CPV Naun fut. come
>   nɨk

Here, both nɨk and khít might be glossed 'think' in English (wâa is itself
a verb meaning 'to express, or intend' and is the second member of com-
pounds with verbs of thinking and saying before complement clauses -- see
Sereechareonsatit 1984). Using khít, however, implicates that the speaker
supposes that what the complement expresses is going to be so, whilst using
nɨk the speaker need only be considering the proposition in question. The
latter takes what we may call propositional complements whilst the former
takes what, for lack of a more felicitous name, we shall here call factive
complements. The distinction, at any rate, seems to be similar to the
distinction observed for English by Bolinger (1975 -- cf. in Newmeyer 1983:
114-115) in the case of those speakers for whom the following are the
facts:

> (17) I understood that explanation to be the wrong one.
>   I understood that the explanation was the wrong one.

where 'understand that' + finite complement has to do with comprehending the
proposition in question, whereas 'understand NP'+ non-finite complement
seems to implicate understanding and in some sense accepting what the
complement proposition expresses.

Other Thai verbs in this class taking factive complements are: bɔ̀ɔk,
tell, yàak-rúu, want to know, khâat, expect; their counterparts taking pro-
positional complements are: phûut, say, thǎam, ask and wǎŋ, hope.

What distinguishes the two sorts of complements is that, when the
complement subject is not an R-expression, they have, in the respective
cases, different privileges of taking antecedents -- or of being even
acceptable at all. Consider then the following: (subscripts indicate
referential indices)

> (18) nuan$_i$ khít wâa nuan$_i$/ phim$_j$ tɔ̂ɔŋ paj rooŋrian wanníi
>   khǎw$_{i,j}$/ PRO$_{i, *j}$

tuaeeŋ$_i$ /khǎweeŋ$_i$
Nuan   Phim must go   school   to-day
he,she PRO
himself   he, himself, she herself

Nuan thinks that NP has to go to school to-day.

Clearly, and unsurprisingly, no ambiguity is caused by the presence of any proper name, R-expression, as the complement subject. khǎw, being an ordinary specific pronoun, can refer back to Nuan or can refer to anyone in the discourse context.

PRO, however, must refer to the upstairs subject exclusively, so that we can see that khît is its controller, but there is more to the matter. The availability of tuaeeŋ, the true reflexive corefering to the subject of khît necessarily, shows that khît assigns case, governs, the complement subject, from which we must conclude that khît (and, in fact, the verbs of its class, above) is an Exceptional Case Marking verb, taking S, rather than S', complements. Indeed, Thai seems to have the rule that whenever -eeŋ ('proper') is affixed to a complement subject it can, must, refer to the matrix subject just if the subject is properly governed (see below). khǎweeŋ is emphatic rather than truly reflexive, but the foregoing rule applies nonetheless; in this case it serves to indicate that she thinks what she thinks about herself rather than another, and -eeŋ serves merely to disambiguate the ordinary third singular pronoun khǎw.

On the other hand,

(19) nuan$_i$ nɨk wâa nuan$_i$/phim$_j$ tɔ̂ɔŋ paj rooŋrian wanníi

khǎw$_{i, j}$/PRO$_{i, j}$
*tuaeeŋ/*khǎweeŋ
Nuan thought that Nuan/Phiim had to go to school to-day.

The most salient observation here is that PRO can refer to the matrix subject, to someone else, such as Phim, to anyone at all, or indeed to (school-going) persons in general. Context may make it get a sort of pragmatic resolution, but never definitively so, and it remains, in the end, non-specific. As an example of PRO's 'resolution' by discourse-pragmatic means, consider

(20) Q.: thammaj prasàət rɨip tham kaanbâan lâ?
why   Prasert hurry do   wor-home Q
Why did Prasert hurry through his homework?

A.: phrɔ́ nuan nɨk waa PRO tɔ̂ɔŋpaj rooŋrian wanníi
Because Nuan thought he had to go to school to-day.

Neither tuaeeŋ nor khǎwee   can be complement subject in (19). Therefore they cannot be properly governed by the matrix verb, nɨk, and hence we have to suppose that this verb, and the others of its class, takes S', rather than S complements.

In this connexion, and given the absence of any overt AGR/INFL system in Thai, we may suppose that grammatical case (never overt in Thai) exists

at least abstractly, as G&B theory predicts, the evidence being the facts adduced about these two forms. We suppose that subjects are perhaps marginally assigned nominative case (or that Thai construes zero-case marking as nominative), but that verbs assign noun phrases in their scope to the right oblique case rather directly or strongly, so that a complement subject in the scope of a matrix verb will be assigned oblique case; the evidence for this (theory-driven) proposal is, in fact, what we have shown about -eeŋ.

Consider, now, matrix verbs of the two respective classes that take (indirect) objects.

(21)   nuan$_i$ bɔɔk   lek$_j$ wâa   nuan/lék/phim$_k$ tɔ̂ɔ   paj rooŋphák
       Nuan   tell   Lek   say   khǎw$_i$,j,k   must go police
                                    PRO $_{i,j,*k}$ station
                                    tuaeeŋ$_i$/khǎweeŋ$_i$
       Nuan told Lek that NP had to go to the police station

The added indirect object changes nothing about what we saw earlier on, except that the matrix sentence has yet another possible antecedent for the downstairs object. PRO, however, both governed and controlled by the matrix verb is still assigned coreference with the latter's subject, or now, other object, and it still cannot refer to anyone else. Control here now is seen to be fairly weak, since it is not enough to assign PRO a unique antecedent. Furthermore, it is now clear that Thai has to be thought of as allowing double-object verb constructions. The matrix verb here clearly takes in its scope of government and case marking not just the noun phrase most immediately to its right (here the indirect object) but also a noun phrase to the right of that (direct object or complement subject in an S-complement.

The corresponding propositional complement case is

(22)   nuan$_i$ phûut kàp   lék$_j$ wâa nuan/lék/phim ...
                                        khǎw$_{i,j,k}$
                                        PRO$_{i,j,k}$
                                    *tuaeeŋ*khǎweeŋ

with a similar, but not identical meaning, and with the privileges of occurence and of anaphora predicted by the theory.

There is, however, a further complication concerning the reflexive, tuaeeŋ. This word turns out to be, at least marginally, ambiguous as between its true reflexive usage and a usage that appears to be nearer to contrastive emphasis (see on khǎweeŋ, above).

S
(23) phim$_i$ khít wâa [nuan$_j$ mâi khâwcaj tuaeeŋi,j]]
          think   neg. understand

    Phim thought that Nuan didn't understand 'herself'

This remains somewhat puzzling, but the theory being advanced here at least
motivates a suggestion about this puzzle. tuaeeŋ is properly governed by
its own clause verb, understand, but since khít takes an S-complement there
is no barrier, at least in the nature of the principle of subjacency, to the
subject that it must refer back to being the subject of the matrix clause.
In propositional complements, on the other hand, tuaeeŋ has only its fully
reflexive usage, for there S$_i$ is a subjacency barrier to its referring back
to the matrix subject.

S'$_S$
(24) phim$_i$ n^{f}k wâa [[nuan$_j$ mâi khâwcai tuaeeŋ$_j$, *$_i$]]].

    It is useful to follow this demonstration up by observing the case in
which complements are embedded in complements: a factive in a factive, a
factive in a propositional, a propositional in a propositional, and a propo-
sitional in a factive. We must examine the subjects of both the middle and
the lowest clause.

(25) nuan$_i$ n^{f}k wâa khaw$_{i,j}$ bɔ̀ɔk wâa wannîi rooŋrian pìt
                  *PRO
                  tuaeeŋ
          Nuan thought NP   said   to-day school   closed
          Nuan thought that NP said that the school was closed to-day.

There is another puzzle here, because we ought to expect PRO to be accep-
table and to refer back necessarily to the matrix subject. However, PRO is
not acceptable here at all. As far as we can tell, this is likely to be
because the verb of the middle clause is also a factive and in this context
(which we cannot entirely specify as yet) has to have an overtly specified
subject. Whatever the ultimate explanation may be, it seems to concern
neither government nor control theory nor anything significant for the
theory of Empty Categories other than the mere fact of phonological emp-
tiness itself. In fact of all the combinations listed above, whether we
examine the subject of the middle or of the lowest clause, the only puzzle
that arises is of the same kind as the one respecting (25), namely, where
the middle clause has a verb taking factive complements and the matrix verb
takes propositionals.

(26) nuan$_i$ n^{f}k wâa khaw bɔ̀ɔk wâa wannîi rooŋrian pìt
                  *PRO
                  *tuaeeŋ
          Nuan thought NP said that to-day the school was closed.

where, once again, all other rules about subject PRO are overridden by the
requirement, if such it be, that a middle clause with a verb itself taking
factive complements must have an overt subject. No other combinations need
be looked at here, since the theory put forward is confirmed in the other
cases, at least as long as the lowest clause is not itself one that takes

factive/propositional complements, in which case, once more, if it takes
factive complements its subject needs to be overtly specified. There is one
further observation that may ultimately turn out to bear upon the account of
why this should be so, and that has to do with what we shall call
contrastive complements. These are complements that have verbs of a certain
class, namely, evaluative (differentially evaluative) adjectives. These are
adjectives like, beautiful, pretty, smart and the like. It seems to be the
case that these are interpreted not absolutely but relatively, in two sen-
ses: (a) to say X is Adj is to say it about X <u>as against</u> others less so;
(b) to say that X thinks (propositional sense) $\overline{\text{X is Adj}}$ is to imply (perhaps
only pragmatically implicate) that it is merely X's counterfactual notion
(see Surintramont 1979:55). Consider, then,

(27) nuan$_i$ khít wâa khǎw suai láe? chalàat
                           ^{i,j} pretty and smart
                  *PRO
                  tuaeeŋ$_i$/khǎweeŋ
      Naun thinks that she is pretty and smart.

(28) nuan nɨk wâa khǎw$_{i,j}$ suai láe? chalàat
                  *PRO
                  tuaeeŋ$_i$,khǎweeŋ$_{i,j}$

Since these adjectives are contrastive in the intended sense, it is
understandable that, at least in complements, their subjects need to be
overtly specified, because PRO is, amongst other things, equivalent to the
unstressed form of English pronouns, thus inappropriate to contrastive use.

(29) PRO sǔai

means   'She is beautiful'

whilst

(30) khǎw sǔai

means

            'Shé is beautiful'

that is, as against someone else of whom this quality is implicitly being
denied. Then, as for (28), nɨk being a verb of thinking that takes proposi-
tional complements, PRO as the subject of said complement is blocked because
the complement is taken as contrastively counterfactual. Indeed, it means,
perhaps sarcastically, something like

28'. Nuan thinks shé is beáutiful
                  shé hersélf

where the accents indicate strong, contrastive stress. Moreover, although
we might expect tuaeeŋ to be unacceptable here because of lack of proper
government of the subject of an S' complement of a propositional verb of
thinking (nɨk), its actual acceptability is here predicted upon the implicit
contrast between the proposition and actuality (or normal expectation).

tuaeeŋ here, then, has not its reflexive usage but only its pseudo-reflexive emphatic usage (the accent upon both she and herself, above), and its use here makes clear, as the use of khăweeŋ does not, that it is Nuan, rather than someone else the discourse may be about, that is the subject of this possibly sarcastic, certainly invidious contrastive emphasis (khăweeŋ here is, when it has the same range as mere khăw, more emphatically contrastive -- something perhaps like English she, of all people!). Note that if Nuan is thought by everyone to be, in fact, ugly and stupid, tuaeeŋ is unexceptionable here, but if it is thought generally apparent that she is indeed pretty and smart, tuaeeŋ simply makes no sense.

Similarly, in (28) again, khăweeŋ is allowed where we ought not to expect its acceptability on the basis of the proposed rules about government and control over the subjects of S'-complements of matrix verbs of thinking. But once again, it occurs quite freely as a contrastive. In their contrastive uses, both these words ending in -eeŋ do not after all conform to the characterisation of anaphors as bound in their governing categories. And even in English, the so-called reflexive, when immediately following a personal pronoun or a name (R-expression) fails to conform to the restrictions on anaphors. Perhaps 'reflexives' are anaphors only when properly governed, and in that case this clearly does not mean that they have no independent reference but rather that it is set equal to that of their binders.

We have already taken note, somewhat in passing only, of the well-known fact that wh-words, those that serve as question words and, in languages like English at least, with wh-movement so-called as relativisers-in-COMP, also serve widely in perhaps most languages as non-specific pronominals and/or articles ('Who steals my purse steals trash.', 'Whatever happens, I'll be satisfied.', 'I'll take whatever (you give me)'. This, we believe, cannot be an accident, being as nearly as possible universally the case. It will be useful, then, to look into this matter here, chiefly in order to notice rather strong independent motivation for the idea, made much of above in connexion with PRO, that disjoint non-specific referentiality has, in many circumstances, a strong tendency to, as it were, seek specific resolution. If this observation is at all significant, then surely it ought to be the case that wh-words in both relativising and wh-question contexts are special instances of wh- non-specific nominals. And the first thing to note is a fact neatly illustrated in Thai.

(31)   kraj   pai
        who   go

means, in this language without any unambiguous marker of wh-questions, eith

        who went?

or

        Someone or other went.

This is the sort of thing that gives prima facie plausibility to the foregoing suggestion; as do related facts in Burmese, a language with independent sentential markers of wh-questions (sentential tag le:), so that

(32) bəthu thwa:dhəle:
Who went?

bəthu (hma.) thwa:te
Just anyone (at all) went.

where thwa: means 'go' and bəthu 'who(ever)'.

It seems that a wh-question, then, may be thought of as a declarative
involving at least one wh-type non-specific nominal that is forced to be
interpreted as (one could say) seeking specific resolution. In English for
example, wh-preposing and subject-auxiliary inversion (taken together with
intonational reinforcement, no doubt) are markers forcing this issue; in
Burmese, the sentential tag le:; in Thai only context determines the issue,
possibly reinforced by cues of intonation, juncture or prosody of some kind
that we currently know little or nothing about. Whatever these markers are,
in syntax or (perhaps in Thai) at Logical Form, their effect of forcing wh-
words to seek resolution is not a matter of government, binding or control,
since the specific resolution of the disjoint non-specificty is simply acti-
vely sought, not found within the question! When, however, we realise that
non-specifics may have a strong tendency to want resolution anyhow (note how
common it is for sentences with non-specific nominals such as

(33) Someone or other came to my cocktail party.

to be taken as what have been called 'guess who? sentences', a species of
riddle asking to be solved), the matter is perhaps somewhat less mysterious.
No doubt this suggestion has something (not much, surely) in common with the
Preformative hypothesis that was common in Generative Semantics some years
ago.

In this connexion (though we cannot pursue the matter in this paper at
all), if wh-questions are statements involving disjoint specifications
seeking resolution, questions in general may be this sort of thing; in par-
ticular, yes/no questions may very well be properly analysable as sentences
with implicit 'or not' disjunct form. More exactly, there is some evidence
that the disjunction (whether syntactic or a matter of LF is not important
at present) is one or other of two sorts: S or not S and S or is the expec-
tation of S wrong. Thus consider, once again, Thai. It is well known that
there are two kinds of yes/no question in this language. One, which is a
perfectly neutral request for information and does not implicate an expec-
tation that the underlying proposition (affirmative or negative -- in the
case of negative questions), ends in mǎi; the other, with its implicature to
the effect that the underlying proposition ought to be the case, ends in rə̌ə
or rə̌ə   plàau.

rə̌ə is uncontroversially the word for 'or', and rə̌ə plàau simply means
'or not', plàau signifying, here, 'at all' and implicating negation quite
commonly. Historically, it is a distinct possibility that mǎi may be a
conflation of negative mâi with the tone of disjunct rə̌ə, a contraction pro-
cess not unexampled in these languages.

As to wh-relativisation, we can only sketch in, here, an idea of why,
at least in languages with wh-relative movement to COMP, and if

Alice Davison (cited earlier) is right, for other languages at the level of logical form, a wh element (disjoint, non-specific) should have to bind a trace from COMP to the proper site of the relativised argument, and how it is that these wh-forms and the traces they bind come to have a specific resolution, or interpretation.

Assume that a relative construction has, one way or other, a head noun phrase with a noun phrase complement clause containing a non-specific (wh-form) nominal with the same intension as the head of the construction -- or a trace of this wh-form bound by the wh-form relativiser in COMP. Allow the theory of control to be extended, quite naturally, so that the head noun phrase controls the material in COMP and suppose, then, that in this cir- cumstance control amounts to imposing on the material in COMP the equivalent of the referentiality of the controller itself. Then, since the wh-COMP binds the trace, which is otherwise a true free variable and so has to be bound (given a referential index of some sort), the reference of the head (or rather the setting of the wh-COMP disjoint index equal to that of the controller head) is passed on to the trace. Note most particularly that this does not always or inevitably lead to specific resolution, since the head of a relative construction may, itself, be non-specific, e.g., any man who wants to.

In turn, the problems supposedly surrounding the analysis of so-called Indirect Questions (see Bresnan 1978) seem likely to vanish in the present framework. In, for example,

(33a) I'd like to know what this is.

the complement, lacking inversion of subject and verb, is clearly no kind of question. There is, moreover, simply no reason to suppose that what is in COMP at all, so that the gap in the position of the predicate nominative following is is not a trace of supposed wh-movement. Rather, what is the position of the direct object of the matrix verb know, and, being non- specific, and lacking control, it remains non-specific, without resolution. The gap in the predicate nominative position of the complement clause is certainly PRO, and this being a relative construction whose head, what, is non-specific, PRO, too, remains so without resolution. Filling of COMP seems generally barred whenever a relative head is wh-non-specific (cf.. whatever book (? that/ *which) you give me).

Finally, there is one further point we should like to examine briefly. As we have mentioned before, Davison has recently argued (1984) that even in languages without syntactic wh-movement in question formation there is evi- dence that at least in Logical Form (within the semantic component) a trace- variable is bound by an operator like English wh-in-COMP. Much of the evidence (the paper is based chiefly on Hindi) for her argument comes down to the observation that even in these languages wh-questins obey the so- called Island Constraints of Ross (1967), in particular (since for languages like Burmese and Thai without true sentential coordinate conjunction there is no coordinate structure constraint defined) the Complex Noun Phrase Constraint -- or, as it has come to be reanalyzed, the Nominative Island Constraint. That is, for our present purposes, a constraint that makes it impossible to wh-question an element inside a clause that is the complement of a lexical head that is in the higher clause; this because it is

disallowed to have an element (wh-in-COMP in a main clause, here) enter into a Binding relationship with a variable if an intervening COMP is lexically filled. But consider (Burmese)

(34) hkin-bya:[u:maung maung bəthu.kou
        you   (name)   who   ind.obj.

      myin-te lou.] ca:thəle:
        see (end) COMP   hear end. wh-q

      Who did you hear that U Maung Maung saw?

(35) hkin-bya: u: maung maung bəthu.kou

$$\begin{Bmatrix} \text{myin-te.} \\ \\ \text{myin-hta} \end{Bmatrix} \text{hsou-hta} \quad \text{ca: th le:}$$
      say NOM

(34) is unimpeachable, as expected; there is no nominative island. (35) however raises interesting questions. myin-te. hsou-hta (the subscript dot indicating creaky tone, quite commonly the mark of a genitive or oblique/dependent category) amounts to the English expression 'the claim that one has seen'. This constitutes a nominative island, and, indeed, that form of (35) cannot be accepted as a plain wh-question. However, it is a perfectly fine echo question: 'You heard the claim that U Maung Maung saw who!?' If this is right, then (say at LF) there can be no wh-in-COMP binding a variable, trace, in the lower clause, and yet the whole sentence (in its acceptable, echo-question reading) ends in le:, supposedly the inherent mark of a true wh-question. But, suppose, in accordance with our earlier remarks on questions and question markers, that all le: does is serve to focus our attention upon the disjoint, non-specific character of the wh-word (bəthu), forcing us to see it as seeking specific resolution. Then, it seems to us, the Nominative Island Constraint is not violated, le: is not, of itself, the mark of a wh-question but only serves to focus attention on non-specificity in some way. After all, if we look carefully at English echo questions of this kind, the foregoing analysis seems apt, since they have surprise intonation, not question intonation, and yet this very 'surprise' factor seems to trigger our taking the wh-word as wanting resolution.

The alternative form of (35), in which the verb of the complment clause is directly nominalised (hta contracted from the non-future finite modal ending te + ha, meaning 'thing') is at any rate rather more acceptable as a true wh-question than the version with myin-te. hsou-hta. However, this may not constitute much of a problem, since, on the one hand, Burmese goes in in a big way for sentences with only nominalised predicates (see Lehman 1985b), and on the other hand, it is far from certain that a somewhat marginal pronominal head to the downstairs clause (a head, ha, with no more content, lexically, than expletive it in English) necessarily constitutes a nominative island (cf., in those English speakers that accept this, Whom did you hear it that I killed?)[2]

NOTES

[1]Clearly, supposing that a pronominal EC can be assigned, by Control, an index identical with that of a nominal in the matrix clause, if we also assume that the former must, after all, have the larger clause as its Governing Category, poses what appear to be severe problems, given the essential idea that pronominals in general must be free in their governing categories. Whatever solution be proposed for the more adequate generalisation of the theory in order to account for the way many languages employ empty categories rather freely, some version of this problem, it seems, must surface. Thus, for instance, we find Huang (1982, 1984) suggesting a revision of the definition of governing category including the qualification that the SUBJECT has to be accessible to a governed item just in case the latter be an anaphor.

This problem, however, may again, be easily overcome. What seems to be required is a clarification of the relation between the domains of government and binding. Suppose that control be defined only as a relation from a higher clause into a lower one, and suppose, furthermore, that control is defined as applying only if binding is inapplicable. Then, if a pronominal be free in its governing category it will never have its index equal or identical to that of a (c-commanding) NP in its own proper clause in any circumstances. But, whilst binding cannot co-index it with a noun phrase in a higher (say next-higher) clause, because it has to be free in this, now possibly governing, category (in the case of an empty downstairs subject of a non-finite clause), control can, in fact, effectually co-index the downstairs EC with a nominal in the higher clause. Providing only that we allow the theory to distinguish between true co-indexing, by means of binding (defining the initial index of an item as identical to or equal to some other index) and resolution of an initial non-specific index as having the specification of another item (by way of control), there should be no contradiction between continuing to define pronominals as free in their governing categories and supposing that they can be controlled in their governing category just in case the latter be the next higher clause. An anaphor being defined as bound in its governing category, control simply can never apply to it, and once more the supposed similarity between anaphors and PRO, namely, that when either is the subject of a downstairs non-finite clause the first must, and the second may, have an 'antecedent' in the higher clause, is superficial only.

The move suggested here is not really very different from the revision in Chomsky (1981, 220), where it is said that an anaphor is bound in its binding category and a pronominal is free in its binding category, if we assume, with Huang (1982) that the accessibility of a SUBJECT be defined differently with respect to pronominals and anaphors. We shall pursue this elsewhere.

[2]This paper was completed and accepted well before the appearance of N. Chomsky's (1986) Knowledge of Language (New York: Praeger). It will be noticed, however, that there are some apparent convergences between the latter and some of the main points of this paper, namely, between the claims made here about the interpretation of relative clauses and the principle of Strong Binding, between our present treatment of wh-in-COMP and the way Chomsky there proposes to treat coindexing of empty variables with the wh-operators binding them, and between our notion that wh-words 'seek a resolution' and Chomsky's principle (once again) of Strong Binding. It should also be observed that Chomsky there makes explicit the resemblance between PRO-Arb. and English one, French on and German man.

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THE PERSISTENCE OF PATTERN IN LANGUAGE

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Some of the greatest linguists have concerned themselves
with the persistence of pattern in a language or in a language
family. Saussure in his first notable publication demonstrated
the continuity of CVC patterning in roots at an early stage of
Proto-Indo-Euroepan (1879). Sapir, with his concern for pro-
cess rather than state, was fascinated by such characteristic
patterning through change, a process which he labeled drift
(1921). Both Saussure and Sapir concentrated on derivational
morphology in assuming that continuity. Also focussing on
derivational morphology, Lightner, in his major work, *Intro-
duction to English Derivational Morphology (EDM, 1983)*, com-
bined these two approaches, examining contemporary English as
a continuation of Proto-Indo-European. A memorial to this
brilliant linguist may well look into some of the background
leading to that difficult and often perplexing work.

EDM is dedicated to Roman Jakobson, who brought Lightner into lin-
guistics in a manner that might well be recorded. Drifting around Cambridge
after completing his undergraduate degree in mathematics at Duke University,
Lightner picked up publications by local scholars, including some by Jakobson.
Disagreeing with Jakobson's conclusions, Lightner looked him up with no know-
ledge at all about him. Upon finding Jakobson in his office, Lightner pro-
ceeded to point out flaws in his work. Jakobson, adjusting his glasses,
responded: 'Who are you?' When Lightner **replied that he was a potential**
graduate student without means, Jakobson informed him: 'I have NDEA fellow-
ships at Harvard and MIT. Which do you want?' Lightner chose MIT. Besides
illustrating the generosity of 'one of the great linguists of our time'
(EDM:i), the incident may recall a period of exponential growth in linguistics,
often as with Lightner through attraction of advanced students with no pre-
vious training in the field.

Curiously, one of the reasons for Lightner's devotion to persistence
of pattern arose from his disillusionment with his own linguistic background,
a disillusionment sharply expressed in his review of the proceedings of a
conference dealing with advances in generative linguistics (1976). Displaying
his remarkable command over data the review points out shortcomings of two
contemporary approaches to the lexicon, interpretative semantics and generative
semantics, while adumbrating his own approach. The review bristles with prob-
lematic examples for analysis of the lexicon. Among problems with form: con-
straints against possible derivations, such as 'nouns in *-al...*from verbs
containing *l (*applial)*'; suffixation in apparenlty simple worlds like *salt*
(cf. *saline*), patterns of word 'shortening' (*gator* from *alligator* but *croc*
from *crocodile*): missing elements (*v* in *poor*, cf. *poverty*), or syllables
(*dime* vs. *decimal*); and many others. Problems with meaning, the second
criterion for identifying morphemes, are also sharply illustrated with the
example *day*--as in its different meanings for the varied stretches of time
throughout the year above the Arctic Circle. In contrast with the claims of
generativists to provide a completely explicit grammar of language, these
examples signal their failure in the simplest areas of the lexicon. More-
over, since identification of morphemes is fundamental for any work in grammar,
the widely heralded grammars of the generativists are without a basis.

Lightner's own solution takes a remarkable turn. He seeks his units in root structure and the phonological system of Proto-Indo-European. Roots represented in Proto-Indo-European phonemes are maintained in English today. As a result, the synchronic representations in EDM follow the refined statement of the Proto-Indo-European root and base structure formulated in Benveniste's monograph of 1935. Lightner's roots have CVC structure, with one difference. In EDM the V is omitted, or rather generated by means of rules as by Panini.

Examples of New English roots in their 'deepest underlying synchronic representation' are *mn*-'think, remember', *wr*-'twist, turn', *kr*-'cut, separate', and so on (1983:140). Forms are made from such roots by ablaut, a process much like that of Proto-Indo-European, with alternation between *e* : *o: ∅*, as in *demented : admonish : amnesty* (ibid:109). The spoken forms could differ considerably from the deep representation, as illustrated by *vertigo : vortex: wrench,* or by *excerpt, discern: cortex: discrete.* Moreover, the process of forming roots remains productive, for some roots and bases do not conform to a Proto-Indo-European etymon, unlike those cited above, e.g. *gt*- for *get* etc., *frws*- for *freeze* etc., and so on. An elaborate set of patterns of ablaut alternations is provided for these and other New English roots (1983:117-18).

Still other roots require further rules. Among such roots are: *pt*-'fly' as in *impetus, pterodactyl, feather; tm*-'cut' as in *esteem, epitome, tmesis; sm*-'one, together' as in *ensemble, simple, same; kʷ]*-'turn, move around' as in *wheel, cycle, polarity; gʷᵇr*- as in *warm, furnace, thermal.* Since some of these roots contain phonological elements foreign to New English, unusual derivational rules are required to arrive at the actual forms. Among such rules are Grimm's law and Verner's law. The derivational morphology of New English virtually recapitulates the history of the language, as far back as Proto-Indo-European.

In addition, it recapitulates a part of the history of Greek. Among rules in EDM is: *gʷ* goes to *b (d* before *e)* or to *g / v, k,* and also *z v,* as in *amphibious, zoo, vitality, quick* (1983:168). The first section of the rule recalls changes of Proto-Indo-European labio-velars in Attic Greek; the last example recalls Grimm's law. Even in the face of such diverse rules, Lightner insists that the 'words [are] lexically related in the synchronic grammar of English' (1983:169).

Possibly the most remarkable constructs of Lightner are laryngeals. Positing the root for 'give' as *dx*- (PIE *dō*- in the older handbooks, *deɣ*- by the laryngeal theory), Lightner accounts for such derivatives as *dative, data* with the rule: 'After a C, laryngeals drop'; for such derivatives as *anecdote, donate, dosage* with the rule: 'After a V, laryngeals assimilate completely to that V if followed by C'; and so on (1983:303-04). Whatever one's hesitations about the assumptions of his abstract elements and his complex derivational rules, one admires the virtuosity with which Lightner handles such forms in his derivational morphology of English today.

Lightner also posits morphemes other than roots, such as the *-t-, -n-, -s-* of the examples in the last rule. The positing and explication of such morphemes owes a great deal to another influence on Lightner, the late Emile Benveniste. Thirty years after the appearance of Benveniste's *Noms d'agent et noms d'action en indo-européen* Lightner wrote a remarkable

review of it. His detailed account is readily accessible to anyone who may prefer it to the original, which Lightner hoped all linguistis would read for its 'understanding, knowledge, and erudition' (1978:429). One result of Benveniste's detailed examination of agentive and action nouns as well as comparatives, superlatives, ordinals and verbal adjectives is the positing of a morpheme *-t-*. Lightner examines Benveniste's conclusions against data from many languages, not neglecting such forms as *better, best, fourth,* as well as forms in French and Russian. His conclusion reads: 'Although the surface forms have changed considerably in, say, NF or NE or NR, it is not clear to me meanings of ordinals, comparatives, superlatives, and past (passive) participles have changed. We still find in the cited new languages *-t-* in some agentive and action nouns; the meanings there cannot have changed. It is not in the least clear to me synchronic analyses will differ in principle from those of Proto-Italic, Proto-Germanic, and Proto-Slavic, resp. I do not see how one could honestly even begin analysis of the new languages without first having at least considered the possibility these forms are all primitively (in the deepest underlying synchronic representations) the same' (1978:446). Having reached such a conclusion on the persistence of pattern, Lightner might well seek to analyze the derivational structure of New English in accordance with the patterns of its earliest attested forms.

Though Lightner's constructs, rules as well as forms, may seem to be extreme, no one has provided a comprehensive account of English derivational morphology comparable in scope to his. Further, no one has taken into account his demand that an adequate account of morphology is fundamental to any grammatical theory. In accordance with his requirements, the numerous 'theories' proposed since publication of his major work are idle speculations.

From the proposers of theory after theory one would like comment on Lightner's demands. Do they agree or disagree with his demand that one of the primary goals of derivational morphology is 'minimization of fortuitous lexical redundancy'? Do they also agree that a satisfactory derivational morphology is essential before formulation of an adequate syntactic theory? Since modularity has become fashionable, such questions may be totally neglected.

It may be more profitable to comment on Lightner's positive contributions than on shortcomings he noted in his adopted field. Equipped with an understanding of language structures Lightner accepted Benveniste's conclusion that Proto-Indo-European had no comparative form, a conclusion that many Indo-Europeanists fail to comprehend (1978:440). It is almost tragic that Indo-Europeanists maintain the myopic approach to their field that can be excused for their predecessors in the 19th century, when production of texts, descriptive studies and dictionaries required all energies of the specialists.

In any field outstanding scholars can be recognized by their perception of important problems, and the most likely solutions. Lightner's grasp of these is most remarkable, especially since he dealt with the Indo-European languages as a general linguist rather than a specialist. His recognition of crucial issues in Indo-European studies is admirable, as when he follows Benveniste in concluding that thematization has the role of focussing on the individual (1978:446).

Are we however to conclude that his approach to derivational mor-
phology is to be accepted? Is the base in any language continued for
millennia, with rules added for innovations, borrowings from other lan-
guages, even departures from the patterns of the proto-language? We
are most unfortunate in the loss of the scholar who had the capability
of pursuing these questions, and especially in the situation that pre-
vented him from making use of contemporary resources for applying his
amazing control of the necessary data.

Lightner himself was resigned about the impasse in linguistics.
He recognized that 'the last century has seen startling breakthroughs in
many aspects of mathematics, physics, astronomy, biology, chemistry (if
one divorces that from physics), the last millennium in linguistics has
nothing vaguely equivalent to offer, and this deplorable ignorance is
obviously not due to lack of talented performers in the field' (1978:449).
It was unfortunate for our field that one of the most talented had such
a brief career. If his efforts to penetrate beyond the 'idiosyncratic
appearance of forms' to their 'deepest underlying synchronic represen-
tations' (1978:446, 449) leads 'talented performers' to examine 'pro-
blems, suggestions, and conclusions' in accordance with his brilliant
devotion, some of his vision for the future of our field may be ful-
filled. We may also hope for a society of the future which may protect,
not least from themselves, its brilliant members, among whom we may cite
Friedmann Bach among many others, so that their talents may be totally
devoted to the advanced concerns they have mastered beyond any of their
contemporaries.

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CHINESE DIALECT AFFINITY BASED ON SYLLABLE INITIALS[1]

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and
Chin-Chuan Cheng

Following the methodology for quantifying degrees of closeness among Chinese dialects proposed in Cheng (1982), this paper presents results of research in Chinese dialect affinity on the basis of modern reflexes of Middle Chinese initial consonants. The data base consists of more than 2,700 morphemes and their phonetic forms in 17 locations (Beijing, Jinan, Xi'an, Taiyuan, Hankou, Chengdu, Yangzhou, Suzhou, Wenzhou, Changsha, Shuangfeng, Nanchang, Meixian, Guangzhou, Xiamen, Chaozhou, and Fuzhou). With the assumption that these dialects are derived from a common ancestor language, the syllable-initial consonants of these dialects are grouped according to Middle Chinese categories. Under each category the number of modern reflexes are compared across these dialects, and these numbers are used to calculated correlation coefficients. The coefficients are interpreted as strength of association. In contrast to traditional studies of Chinese dialect grouping, which is largely based on impressionist judgments, this study provides quantitative measurements of dialect affinity.

1. Measurements of Language Affinity

One of the objectives of science is to express things in terms of verifiable measurements. In the investigation of language relationships, it is particularly desirable to go beyond mere classification to find ways to measure degrees of affinity. In the 1950's the lexicostatistical method called glottochronology first proposed by Swadesh (1950) generated a great deal of enthusiasm among linguists. Glottochronology proposed to use about 200 "basic" words to measure the percentage of shared cognates in a pair of languages. It further calibrated time-depths of language evolution on the basis that 66% of cognates would be shared by languages 1,000 years after they have split off from the parent language. Criticisms of this particular lexicostatistical method have been directed at the concept of basic vocabulary and at the validity of the uniform retention rate of lexical evolution. Traditionally, genetic relationships are

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[1] An earlier version of this paper was read at the Seventeenth International Conference on Sino-Tibetan Languages and Linguistics, Eugene, Oregon, September 7-9, 1984.

determined largely on the basis of phonological, morphological, and syntactic features of cognates and not on the basis of number of cognates. This type of lexicostatistical measurement of time depth thus lost its attractiveness in the ensuing decades.

However, lexicostatistical measuring remains to be an interesting and significant area of linguistics. Hsieh (1977) proposes to count the number of phonological forms in cognates shared by a pair of dialects to determine subgrouping. He actually applied this method to subgrouping of 20 localities in Jiangsu Province, China. But he stopped short of measuring the degrees of closeness.

In 1979 C. C. Cheng presented a paper dealing with measurements of degrees of Chinese dialect affinity in the Sino-Tibetan Linguistics and Languages Conference in Paris. That paper discussed both lexical and phonological correlations among 18 Chinese dialects. Briefly, the quantification utilized the presence or absence of lexical and phonological forms as the basis for deriving Pearson's Product-moment correlation coefficients. The correlation coefficients were then interpreted as degrees of closeness. Subsequently, the part that dealt with phonological correlations was determined to be somewhat inadequate because it treated phonological forms indiscriminately without paying due regard to their historical derivation. The lexical measurements, however, were pursued further and the results were reported in Cheng (1982).

Cheng (1982) discusses the lexicostatistical method as a justifiable approach to measurements of dialect affinity as a result of both genetic derivation and cultural history. Since it is known that words of culturally dominating dialects are often borrowed into other dialects, the lexicon can be considered a composite form of language history and cultural interactions. The lexical items in the Hanyu Fangyan Cihui (Beijing University 1964) were tabulated according to their presence or absence in the 18 dialects reported. These occurrences in each pair of dialects were then utilized to calculate the correlation coefficients between the dialects. The coefficients for all the pairs were calculated and were interpreted as degrees of closeness. The statistical validity and the results are discussed in detail in that paper. This method has been applied to the study of phonological closeness. This paper presents results of such quantification in terms of initial consonants only. Other phonological categories will be treated in the future.

2. Measurements of Phonological Affinity

In the past, Chinese dialect grouping relied a great deal on phonological characteristics, especially those pertaining to historical evolution from Middle Chinese. For example, the Wu and some Xiang dialects retain the voiced obstruent initials while others have undergone devoicing. Another example of useful phonological characteristics is the merger of l and n. Hankou, Chengdu, Changsha, Shuangfeng, and Nanchang can be separated from other dialects as they have undergone such a merger. As the list of characteristics is enlarged, one encounters the problems of intersection and overlapping of features. Feature overlapping, as often the case in

criss-crossing isoglosses, blurs the boundaries established with a single criterion. Moreover, phonological characteristics may have different effects. Their weights are not readily explicable. Furthermore, the effects of exceptions are not considered in the numeration of features for dialect classification. Most serious of all, such a dialect subgrouping does not show the degrees of closeness.

This paper presents an approach that hopefully eliminates or reduces the magnitude of these problems. In this approach, a large quantify of words are used in deriving the numerical indices of dialect correlation. Generally speaking, weightier characteristics affect more words. In our view, words are carriers of sound change. As we take into consideration many words, exceptions are also figured in the calculation of the correlation coefficients. Therefore, the "weight" or importance of features is accounted for.

3. Data Base and Methodology

The data base of this study is *Hanyu Fangyin Zihui* (*Zihui*) (Beijing University 1962). *Zihui* contains more than 2,700 morphemes including homophones. For each morpheme the phonological categories of traditional rime books and rime tables as well as phonetic symbols for modern pronunciation in 17 localities are given. These 17 localities represent the major dialects of Chinese: Beijing, Jinan, Xi'an, Taiyuan, Hankou, Chengdu, Yangzhou, Suzhou, Wenzhou, Changsha, Shuangfeng, Nanchang, Meixian, Guangzhou, Xiamen, Chaozhou, and Fuzhou. In the 1960s the *Zihui* materials were used to establish a computer data base. The data base was called DOC for Dictionary on Computer. Its structure and various investigations in the line of lexical diffusion can be found in Lyovin (1968), Wang (1970), Wang (1977), and Cheng (1972).

The modern reflexes of the Middle Chinese initials in these dialect localities have been tabulated and presented in 40 tables in Cheng and Wang (1971). In this study, however, the occurrences of the initials have been re-tabulated to ignore literary and other variant readings. The initials and the number of cases are given in Table 1.

For each initial category, the modern reflexes for each of these dialects were tabulated. For example, the reflexes of the morphemes which had the *p* initial in Middle Chinese are *p*, *ph*, *b*, and *m* in these dialects. The number of occurrences of these categories is given below.

Dialect	p	ph	b	m
Beijing	88	3	0	1
Jinan	89	2	0	1
Xi'an	88	3	0	1
Taiyuan	89	2	0	1
Hankou	88	3	0	1
Chengdu	87	5	0	0
Yangzhou	89	3	0	0
Suzhou	90	0	2	0
Wenzhou	89	0	1	0

Initials	Tranditional terms	Number of cases
p	帮	92
ph	滂	41
b	并	77
m	明	94
f	非	37
fh	敷	19
v	奉	37
ɱ	微	24
t	端	80
th	透	63
d	定	109
n	泥	45
ʈ	知	42
ʈh	彻	13
ɖ	澄	58
k	见	206
kh	溪	99
g	群	61
ŋ	疑	77
ts	精	91
tsh	清	61
dz	从	61
s	心	118
z	邪	36
tʃ	庄	27
tʃh	初	28
dʒ	崇	19
ʒ	生	50
tɕ	章	82
tɕh	昌	28
dʑ	船	17
ɕ	书	56
ʑ	禅	52
ʔ	影	97
x	晓	80
ɣ	匣	127
ɣj	云	41
ɤ	以	84
l	来	168
ȵ	日	43

Table 1. Middle Chinese Initials and Number of Cases

Changsha	88	4	0	0
Shuangfeng	85	6	1	0
Nanchang	86	6	0	0
Meixian	85	7	0	0
Guangzhou	87	5	0	0
Xiamen	85	7	0	0
Chaozhou	86	6	0	0
Fuzhou	85	7	0	0

The original source (*Zihui*) does not provide the modern pronounciation of some words for some dialects. That is why in the above list the total occurrences are not uniform. Since these morphemes are all derived from Middle Chinese initial *p*, one can find the genetic relationship among the dialects by comparing these numbers. In statistics, Pearson's Product-moment correlation has been used for obtaining correlations of bivariate data which are nominal-dichotomous. The definition of the correlation is as follows:

$$r_{zv} = \frac{\sum_{i=1}^{n} (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\left[\sum_{i=1}^{n}(X_i - \bar{X})^2\right]\left[\sum_{i=1}^{n}(Y_i - \bar{Y})^2\right]}} .$$

The correlation coefficient measures the strength of correlation between X and Y. Its values may range from positive 1 to negative 1. The sign indicates the direction, whether positive or negative, of the correlation. The numerical value expresses the degree of correlation, the higher the value, the greater the association. In actual calculation, the formula can be further derived for ease of manipulation as follows:

$$r_{zv} = \frac{n \sum X_i Y_i - (\sum X_i)(\sum Y_i)}{\sqrt{[n \sum X_i^2 - (\sum X_i)^2][n \sum Y_i^2 - (\sum Y_i)^2]}} .$$

As an example, to calculate the coefficient between Beijing and Jinan in terms of the reflexes of Middle Chinese initial *p*, the numbers are as follows:

n=4; x =88, y =89; x =3, y =2; x =0, y =0; x =1, y =1.

$$r = \frac{4 \times (88 \times 89 + 3 \times 2 + 0 \times 0 + 1 \times 1) - (88+3+0+1) \times (89+2+0+1)}{\sqrt{[4 \times (88^2+3^2+0^2+1^2)-(88+3+0+1)^2] \times [4 \times (89^2+2^2+0^2+1^2)-(89+2+0+1)^2]}}$$

$$= 0.9999$$

Thus the correlation coefficient is 0.9999. This number is interpreted as the degree of closeness between Beijing and Jinan in terms of the reflexes of the Middle Chinese *p* initial. This example illustrates how correlation coefficients are derived.

In the tabulation of reflexes, the historical origins are kept distinct. In other words, the modern *p* derived from Middle Chinese *p* is considered a case distinct from the modern *p* derived from a different Middle Chinese initial such as *ph*. In this way the historical relations are maintained. Altogether, there were 470 cases in the tabulation. These cases are listed in the Appendix. The BMDP package on CYBER 175 at the University of Illinois at Urbana-Champaign was used to calculate the coefficients of all the cases for all the dialect pairs. The correlation coefficients thus calculated are given in Table 2. The coefficients are interpreted as degrees of closeness.

4. Degrees of Closeness

The correlations at the highest level occurred between Beijing and Jinan (.9941), between Hankou and Chengdu (0.9858), between Taiyuan and Yangzhou (0.9729), and between Xiamen and Chaozhou (.9726). The Guangzhou-Shuangfeng pair shows the least degree of closeness (.3731). The coefficients can be divided into 7 levels to show the closeness of the dialects. The degrees of closeness of the pairs Beijing-Jinan, Beijing-Xi'an, etc. fall within the range .9999-.9000. We may therefore say that they are linked at this level. In the following arrangements of the degrees of closeness, the dialects on the first column are linked to the dialects in the second column at the specified level.

	.9999 - .9000
Beijing	Jinan, Xi'an
Jinan	Beijing, Xi'an
Xi'an	Jinan, Beijing, Yangzhou, Taiyuan
Taiyuan	Yangzhou, Xi'an
Hankou	Chengdu
Chengdu	Hankou
Yangzhou	Taiyuan, Xi'an
Suzhou	Wenzhou
Wenzhou	Suzhou
Xiamen	Chaozhou
Chaozhou	Xiamen, Fuzhou
Fuzhou	Chaozhou

	.8999 - .8000
Beijing	Yangzhou, Taiyuan
Jinan	Yangzhou, Taiyuan
Xi'an	Nanchang
Taiyuan	Jinan, Beijing, Nanchang, Chengdu, Hankou
Hankou	Changsha, Yangzhou, Taiyuan

	Beijing	Jinan	Xi'an	Taiyuan	Hankou	Chengdu	Yangzhou	Suzhou	Wenzhou	Changsha	Shuangfeng	Nanchang	Meixian	Guangzhou	Xiamen	Chaozhou	Fuzhou
Beijing	1.0000																
Jinan	.9941	1.0000															
Xi'an	.9615	.9628	1.0000														
Taiyuan	.8609	.8610	.9280	1.0000													
Hankou	.7121	.7060	.7592	.8025	1.0000												
Chengdu	.6982	.6967	.7548	.8159	.9858	1.0000											
Yangzhou	.8833	.8779	.9319	.9729	.8183	.8111	1.0000										
Suzhou	.6521	.6492	.7022	.7393	.5828	.5909	.7418	1.0000									
Wenzhou	.6551	.6520	.6996	.7173	.5575	.5557	.7240	.9110	1.0000								
Changsha	.7356	.7307	.7294	.6635	.8548	.8423	.6878	.5712	.5386	1.0000							
Shuangfeng	.5855	.5831	.6024	.5634	.7743	.7573	.5931	.6060	.6330	.7558	1.0000						
Nanchang	.7520	.7608	.8154	.8551	.7021	.7069	.8669	.7330	.7133	.5645	.5762	1.0000					
Meixian	.5806	.5825	.6376	.6958	.5553	.5533	.6959	.6895	.6796	.5198	.4522	.8051	1.0000				
Guangzhou	.5299	.5304	.5501	.5332	.4028	.3826	.5552	.5107	.5302	.4065	.3731	.6029	.7299	1.0000			
Xiamen	.6100	.6038	.6517	.6857	.5753	.5625	.7144	.7091	.6617	.6087	.4944	.7539	.8165	.6592	1.0000		
Chaozhou	.6336	.6301	.6808	.7230	.6054	.5986	.7396	.7441	.6974	.6166	.5250	.8020	.8677	.6935	.9726	1.0000	
Fuzhou	.6863	.6865	.7378	.7677	.6539	.6318	.7950	.7137	.6976	.6715	.5509	.7389	.7808	.6384	.8889	.9017	1.0000

Table 2. Correlation Coefficients – Initials

Chengdu	Changsha, Taiyuan, Yangzhou
Yangzhou	Beijing, Jinan, Nanchang, Hankou, Chengdu
Changsha	Hankou, Chengdu
Nanchang	Yangzhou, Taiyuan, Xi'an, Meixian, Chaozhou
Meixian	Chaozhou, Xiamen, Nanchang
Xiamen	Fuzhou, Meixian
Chaozhou	Meixian, Nanchang
Fuzhou	Xiamen

.7999 - .7000

Beijing	Nanchang, Changsha, Hankou
Jinan	Nanchang, Changsha, Hankou
Xi'an	Hankou, Chengdu, Fuzhou, Changsha, Suzhou
Taiyuan	Fuzhou, Suzhou, Chaozhou, Wenzhou
Hankou	Shuangfeng, Xi'an, Beijing, Jinan, Nanchang
Chengdu	Shuangfeng, Xi'an, Nanchang
Yangzhou	Fuzhou, Suzhou, Chaozhou, Wenzhou, Xiamen
Suzhou	Chaozhou, Yangzhou, Taiyuan, Nanchang, Fuzhou, Xiamen, Xi'an
Wenzhou	Yangzhou, Taiyuan, Nanchang
Changsha	Shuangfeng, Beijing, Jinan, Xi'an
Shuangfeng	Hankou, Chengdu, Changsha
Nanchang	Jinan, Xiamen, Beijing, Fuzhou, Suzhou, Chengdu, Hankou
Meixian	Fuzhou, Guangzhou
Guangzhou	Meixian
Xiamen	Nanchang, Yangzhou, Suzhou
Chaozhou	Suzhou, Yangzhou, Taiyuan
Fuzhou	Yangzhou, Meixian, Taiyuan, Nanchang, Xi'an, Suzhou

.6999 - .6000

Beijing	Chengdu, Fuzhou, Wenzhou, Suzhou, Chaozhou, Xiamen
Jinan	Chengdu, Fuzhou, Wenzhou, Suzhou, Chaozhou, Xiamen
Xi'an	Wenzhou, Chaozhou, Xiamen, Meixian, Shuangfeng
Taiyuan	Meixian, Xiamen, Changsha
Hankou	Fuzhou, Chaozhou
Chengdu	Beijing, Jinan, Fuzhou
Yangzhou	Meixian, Changsha
Suzhou	Meixian, Beijing, Jinan, Shuangfeng
Wenzhou	Xi'an, Fuzhou, Chaozhou, Meixian, Xiamen, Beijing, Jinan, Shuangfeng
Changsha	Yangzhou, Fuzhou, Taiyuan, Chaozhou, Xiamen
Shuangfeng	Wenzhou, Suzhou, Xi'an
Nanchang	Guangzhou
Meixian	Yangzhou, Taiyuan, Suzhou, Wenzhou, Xi'an
Guangzhou	Chaozhou, Xiamen, Fuzhou, Nanchang
Xiamen	Taiyuan, Wenzhou, Guangzhou, Xi'an, Beijing, Changsha, Jinan
Chaozhou	Wenzhou, Guangzhou, Xi'an, Beijing, Jinan, Changsha, Hankou
Fuzhou	Wenzhou, Jinan, Beijing, Changsha, Hankou, Guangzhou, Chengdu

.5999 - .5000

Beijing	Shuangfeng, Meixian, Guangzhou
Jinan	Shuangfeng, Meixian, Guangzhou
Xi'an	Guangzhou
Taiyuan	Shuanfeng, Guangzhou
Hankou	Suzhou, Xiamen, Wenzhou, Meixian
Chengdu	Chaozhou, Suzhou, Xiamen, Wenzhou, Meixian

Yangzhou	Shuangfeng, Guangzhou
Suzhou	Chengdu, Hankou, Changsha, Guangzhou
Wenzhou	Hankou, Chengdu, Changsha, Guangzhou
Changsha	Suzhou, Nanchang, Wenzhou, Meixian
Shuangfeng	Yangzhou, Beijing, Jinan, Nanchang, Taiyuan, Fuzhou, Chaozhou
Nanchang	Shuangfeng, Changsha
Meixian	Jinan, Beijing, Hankou, Chengdu, Changsha
Guangzhou	Yangzhou, Xi'an, Taiyuan, Jinan, Wenzhou, Beijing, Suzhou
Xiamen	Hankou, Chengdu
Chaozhou	Chengdu, Shuangfeng
Fuzhou	Shuangfeng

	.4999 - .4000
Hankou	Guangzhou
Changsha	Guangzhou
Shuangfeng	Xiamen, Meixian
Meixian	Shuangfeng
Guangzhou	Chengdu, Hankou
Xiamen	Shuangfeng

	.3999 - .3000
Chengdu	Guangzhou
Shuangfeng	Guangzhou
Guangzhou	Shuangfeng

5. Dialect Subgrouping

The levels of linkage presented above show the relationships of one dialect with respect to the others. To graphically represent the relationships, the coefficients were further processed for a cluster analysis using unweighted average linking. The BMDP package was again used to make subgroupings. The linkage tree is presented in Figure 1. In this figure, we see that the understanding of Chinese dialect grouping based on traditional historical linguistics reasoning is largely maintained. In this linkage tree, only initials were taken into consideration.

In discussing the relationships on the basis of phonology among Mandarin dialects, Zhan (1981b) concludes that Southwestern Mandarin dialects in comparison with Northwestern and Eastern Mandarin dialects are closer to Beijing. It is interesting to observe that in terms of our calculation, Xi'an of the Northwestern group and Yangzhou of the Eastern group are closer to Beijing than Hankou of the Southwestern group. The coefficients for the pairs Beijing-Xi'an, Beijing-Yangzhou, and Beijing-Hankou are respectively 0.9615, 0.8833, and 0.7121. Moreover, Zhan (1981a) in several places ventures to indicate degrees of relationships among Chinese dialects without providing specific calculation. For example, he states that Kejia and the Gan group are much more closely related than the dialects within the Min group. He thus concludes that the conventional classification of the Min dialects as a group has a great deal to do with history and geographical factors. On the contrary, our results show that in terms of initials the Min dialects are closer to each other (above 0.8889) than are Meixian and Nanchang (0.8051).
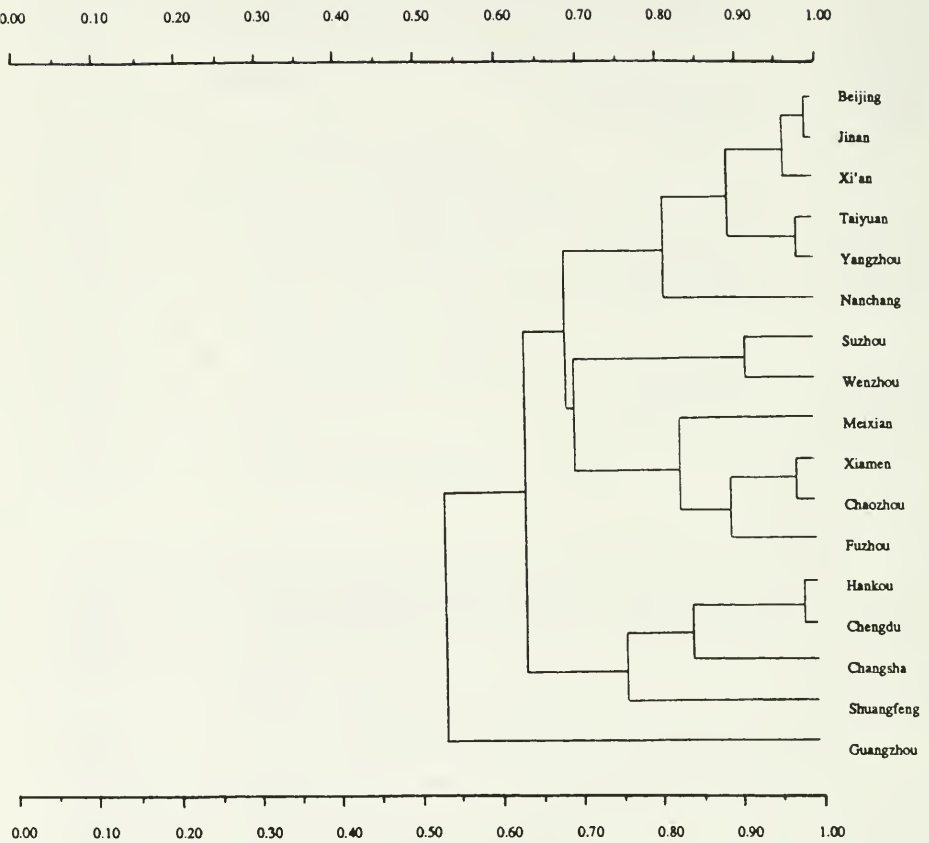
Figure 1. Dialect Affinity Based on Initials

The purpose of this study is to present a methodology that applies numerical taxonomy to linguistic relationships. To be sure, a dialect tree based on initials only cannot show the overall picture of affinity. We will continue to work on degrees of closeness on the basis of other phonological as well as syntactic elements.

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Appendix Modern Reflexes of Middle Chinese Initials

Locations:

1. BJ = Beijing	7. YZ = Yangzhou	13. MX = Meixian
2. JN = Jinan	8. SZ = Suzhou	14. GZ = Guangzhou
3. XA = Xi'an	9. WZ = Wenzhou	15. XM = Xiamen
4. TY = Taiyuan	10. CS = Changsha	16. CZ = Chaozhou
5. HK = Hankou	11. SF = Shuangfeng	17. FZ = Fuzhou
6. CD = Chengdu	12. NC = Nanchang	

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
帮	p	88	89	88	89	88	87	89	90	89	88	85	86	85	87	85	86	85
	p'	3	2	3	2	3	5	3			4	6	6	7	5	7	6	7
	b								2	1		1						
P	m	1	1	1	1	1												
滂	p'	40	40	38	40	39	39	40	39	38	38	38	40	38	39	37	36	40
	p	1	1	3	1	1	1	1	2	3	3	2	1	2	2	4	5	1
	f					1	1											
p'	x												1					
并	p	38	36	32	38	37	37	38			72	4	5	10	33	57	39	64
	p'	39	41	44	38	40	39	38			5	9	72	67	43	20	37	13
	b								77	77		64						
b	f			1	1		1	1							1			
明	p'															1		
	b															54	20	
	m	94	94	94	94	94	94	94	93	94	94	93	94	94	94	35	73	94
	t															1		
	ŋ														1			
	h															2		
m	ø							1							1			
非	p	1	1	1	1	1	1	1	1	1	1	1	1	3	1	10	6	5
	p'						1	2				1	2	1		2		5
	ʒ̶												34					
	f	36	36	36	36	36	35	34	36	25	30			33	36			
	x									11	5	36						27
	h															21	30	
f	ø						2				1		2		1			5
敷	p																1	1
	p'	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	1	1
	b									1	1							
	ʒ̶												18					
	f	18	18	18	18	18	18	18	17	8	14			17	18			
	x									9	4	17						17
	ɣ											1						
f'	h														16	17		

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
奉	p															7	5	2
	pʻ												1	5		3	3	2
	ɸ												36					
	f	37	37	37	37	37	37	37	1	1	29			32	37			
	v								36	25								
	x										8	10						33
	ɣ											27						
	h															27	29	
v	ɦ									11								
微	b															20	16	
	m	1	1				1	1	10	6	1	2	2	7	23	4	8	6
	ɸ												1					
	f									1	1							
	v			23	24		7		11	13				17				
	n								1									
	x											1						
	ɦ									3								
ŋ	ø	23	23	1		24	16	23	2	1	22	21	21		1			18
端	p														1			
	pʻ																	1
	t	79	79	78	78	78	78	79	78	78	80	79	78	78	76	76	78	76
	tʻ			1	1	1	1	1	1				1	2	2	1		2
	d								1	1		1						
	n	1			1	1								1	1			
	ts																1	1
	ŋ̥		1	1			1						1					
	k														1			
t	kʻ																1	
透	t	1	1	2	5	2	1	2			4	1		1	1	4	1	4
	tʻ	62	62	61	58	61	62	61	60	60	59	61	62	61	62	57	61	59
	d								3	3		1						
	n															1		
tʻ	ts															1		
定	t	56	56	57	57	56	57	57	1	1	100	7	4	9	56	89	71	98
	tʻ	53	53	52	52	53	52	52	2	2	9	16	105	99	53	20	37	10
	d								106	106		85						
	tsʻ																1	1
d	s											1						

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
泥	t																1	
	n	43	26	26	43	43	28	43	29	26	26	27		30	43	20	27	30
	l	1	3	2	2				1	1			29		1	22	15	14
	ts					1	1				1							
	tsʻ										1							
	dz															3		
	s	1						1	1	1								
	z						1										2	
	ʐ										1							
	tɕ											1						
	ɲ		16	17			15		14	16	14	15	15	12				
	j														1	1		
n	ø				1						2	2	1	1				1
知	pf			15														
	t	1	1	1	1	1	1	1	1	1	1	17	1	2	1	28	22	36
	n							1										
	ts			3	41	35	41	38	39	17	4	5	34	36	1	13	18	6
	tsʻ													1			1	
	dz									1								
	z							1										
	tʂ	41	41	23							27	4						
	tʂʻ											1						
	tʃ														40			
	tɕ					6		2	1	23	10	14	6					
	ɲ													2				
ち	k											1				1		
彻	pf			1														
	pfʻ			2														
	t															2		1
	tʻ											2				6	8	9
	l															1		
	ts				1	1	1	1	2	1			1	1		1	2	
	tsʻ			3	11	12	12	10	11	4	3	2	12	11		3	3	3
	s										1							
	tʂ	1	1	1							1							
	tʂ	12	12	6							8	1						
	tʃ														1			
	tʃʻ														12			
	tɕ										1							
	tɕʻ			1				2		6	5							
	dʐ									2								
	kʻ											2						
ちʻ	h													1				

(Continued)

母	音	BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
澄	pf			11														
	pf'			10														
	t	1	1	1	1	1	1	1	1		1	3	2	1	1	45	34	43
	t'									1						7	11	6
	d											18						
	ts	1		6	26	20	21	27			4		4	2		3	9	6
	ts'			3	31	31	36	29			5	1	47	52		1	4	2
	dz								27		4							
	s													2		1		1
	z								56	3								
	tʂ	26	27	9							33	1						
	tʂ'	30	30	18							2	1						
	dʐ											5						
	tʃ														24			
	tʃ'														30			
	ʃ														3			
	tɕ				2						9							
	tɕ'				4		1				3	4	5					
	dʑ						.		1	26		20						
φ	ʑ										1							
	ɦ									1								
见	t										3	18						
	n					1	1				1	1	1					
	l	1	1	1	1			1	1	1			1	1		1	1	1
	ts					4			1	15	2					1	1	3
	ts'																1	
	tɕ	140	141	141	139	123	135	124	101	83	110	90	85					
	tɕ'		1										1					
	ʑ						1	1			1	1						
	k	123	120	122	120	136	126	138	161	167	147	153	173	254	255	255	254	257
	k'	5	6	5	9	5	6	5	3	2	5	5	6	13	12	8	12	7
	g									1		1			1			
	ŋ														1			
	h							1					2	1				
K	θ												1		1	1		
溪	Φ												2					
	f														14			
	t'											11				1	1	1
	ts				1	4	1			11				2				
	ts'	1	1	1														
	tɕ									3								
	tɕ'	37	36	38	36	33	37	36	34	24	36	22	33					
	ɕ	1	1	1	1													
	j														1			
	k			1	1	2		2	1				2	2	1	5	4	5
	k'	60	61	58	60	60	61	61	61	64	63	66	61	92	29	92	92	92
	ŋ														1			
	h													3	53			
K'	θ														1	1	1	1

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
群	t											5						
	t'											1						
	d											12						
	ts				2						1							
	ts·				2		1											
	dz									8								
	tɕ	27	28	27	27	25	26	32	2		53	1	12					
	tɕ'	29	28	29	29	27	29	24			2	4	44					
	dʐ								55	51		32						
	k	3	3	3	2	3	3	3			4			4	24	44	29	47
	k'	2	2	2	3	2	2	2			1	2	5	55	37	17	32	13
	g								4	1		4						
g	ø																	1
疑	v			1	16	7			4									
	n	5			6	8	6			1								
	dz														1			
	ȵ			2	10		13		31	31	16	25	32	35				
	j														30			
	k															2	1	
	g						1									49	13	
	ŋ		15	16	16	17	14		30	24	19	22	24	38	37	15	56	75
	x																	1
	ɣ											5						
	h															5	4	
	ɦ								5	1								
ŋ	ø	72	60	50	39	52	42	71	10	16	41	25	20	4	10	3	3	1
精	t															2		
	ts	51	50	52	50	51	48	51	86	66	82	38	50	88		85	85	86
	ts'				1		1	1	1		3	1	1	3		1	6	5
	dz															2		
	s															1		
	z									1								
	tʃ														88			
	tʃ'														2			
	tɕ	40	39	39	39	39	40	38	4	22	5	49	38					
ts	tɕ'		2		1	1	2	2			1	1	3	1				
清	ts			2				1							1		3	
	ts'	35	35	33	35	35	35	34	60	49	58	31	34	59	5	60	57	61
	s													1	1			
	tʃ														2			
	tʃ'														54			
	tɕ			1			1					1						
	tɕ'	26	26	25	26	26	26	25	1	11	3	29	26					
tsʰ	k																	1

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
从	t															1	1	
	ts	17	17	16	18	15	15	16	1		49	2	1	5		48	34	50
	tsʻ	17	17	18	16	19	18	18			8		34	54		11	25	8
	dz									2		26			1			
	s													2				2
	z								60	42							1	
	tʂ										1							
	tʃ														31			
	tʃʻ														30			
	tɕ	15	15	16	15	15	14	14			2	3	8					
	tɕʻ	12	12	11	12	12	14	13			1	6	18					
	dʑ									2		22						
	k																	1
dz	ɦ									14								
心	ts			1			1	1			1			1		1	1	
	tsʻ	1				2	1	1			1	1	1	2		3	5	5
	s	54	51	52	53	52	52	53	118	84	111	55	54	114	11	113	112	112
	tʃ														1			
	tʃʻ														5			
	ʃ														100			
	ɕ	63	67	65	65	64	64	63		33	5	62	63					
	x																	1
s	h													1		1		
邪	f										1			1				
	ts										8							
	tsʻ	3	3		3	3	3	3					3	10		2	8	1
	dz											16				1		
	s	11	9	13	10	12	9	12	2	2	23	1	11	25	1	32	27	35
	z								34	17							1	
	tʃ														20			
	tʃʻ														13			
	ʃ														2			
	tɕ							1			1							
	tɕʻ	1	1		1	1		2						4				
	dʑ									1		15						
	ʑ	21	22	23	22	20	23	18			3	4	17					
	x		1				1											
z	ɦ									15								
庄	pf			6														
	t															1		
	tʻ																	1
	n															3	2	
	ts	4	2	17	26	27	26	26	27	25	21	18	26	27		20	23	24
	tsʻ	1		1	1		1	1		1	1		1			2		1
	z																2	
	tʂ	22	25	3														
	tʃ														27			
	tɕ									1	4	7						
tʃ	h															1		

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
初	pfʻ			7														
	tʻ											1				1	1	
	ts			1							2					2		1
	tsʻ	5	2	17	28	28	28	28	28	26	22	20	27	27		24	26	26
	s												1			1	1	1
	tʂ		1															
	tʂʻ	23	25	3														
	tʃʻ														28			
tʃˑ	tɕʻ									2	4	6						
崇	pf			3														
	pfʻ			3														
	t										1							
	tᶜ											1				1		1
	ts			6	9	9	9	9		2	11		3	2		10	9	10
	tsʻ			4	7	7	7	7			1	2	12	14		4	7	3
	dz									4		14						
	s			3	3	3	3	3			1		2	3		3	3	4
	z								19	10								
	tʂ	9	9															
	tʂʻ	7	7								1							
	ʂ	3	3								2							
	tʃ														9			
	tʃʻ														7			
	ʃ														3			
	tɕ										1							
	tɕʻ										1	1						
	dʑ									2								
	kʻ															1		1
dʒ	ɦ									1								
生	f			16														
	tʻ															1		
	tsʻ						1						2	1		2	2	1
	dz											1						
	s	10	3	30	50	49	49	50	50	43	31	33	50	47	2	46	48	49
	ʂ	40	47	4							7	3						
	ʃ														47			
	tɕʻ																	
ʃ	ɕ					1				4	12	13						
章	pf			22														
	t											21				3	2	1
	ts		1	20	82	72	81	80	82	53	3	2	74	81	1	78	77	81
	tsʻ													1				
	s					1	1										1	
	tʂ	82	81	39							66	23						
	tʃ														80			
	tɕ			1		9			2	29	13	34	8					
tɕ	k											2					2	

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
昌	pfʻ			15														
	t															1		
	tʻ					1						20				1		
	ts				1		1	1										1
	tsʻ			2	27	22	27	27	28	11	1		26	28	1	25	27	27
	tʂ		2															
	tʂʻ	28	26	11							15	2						
	tʃ														4			
	tʃʻ														23			
	tɕ·					5				17	12	6	2					
	k															1		
tɕʻ	kʻ																1	
船	pfʻ			1														
	f			5														
	t															1	1	
	d											1						
	ts															6	4	
	tsʻ				3	2	1	3				1						
	dz									1		1						
	s		1	1	14	11	16	11					16	17	1	10	12	16
	z								17	9								
	tʂʻ	3	3	1														
	ʂ	14	13	9							12	3						
	tʃ														1			
	ʃ														15			
	tɕ										1							
	tɕʻ					1												
	ɐ					3		3			4	4						
	ɣ											8						
dʑ	h									7								
书	pfʻ			1														
	f			10														
	tʻ																1	1
	ts						1									2	4	3
	tsʻ			1	2	2	2	2	1	2			2	7		5	5	6
	dz																1	
	s			9	54	50	54	47	54	36	1		48	49	3	47	46	47
	tʂ											1						
	tʂʻ	2	2								2							
	ʂ	54	54	35							44	15						
	tʃʻ														5			
	ʃ														48			
	tɕʻ									1		1						
	ɐ					4		7		16	9	39	4					
ɕ	θ									1								

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
禅	pf'			3														
	f			8														
	t																1	
	d											6						
	ts				1	1	1	1					1			3	4	1
	ts'				18	11	10	19			1		13	6		1	7	1
	dz									3		7						
	s			8	33	34	40	28		1	3		34	43	1	48	40	50
	z								52	29								
	tʂ	1	1	1							11							
	tʂ'	19	20	14								1						
	dʐ									4		4						
	ʂ	32	31	18							29	2						
	tʃ														2			
	tʃ														3			
	ʃ														46			
	tɕ				2		1				1		1					
	ɕ				3		3				7	6	3					
	ɣ											25						
	h														2			
乚	ɦ									15								
影	v				20		3							21				
	t															1		1
	l															1		
	ts															1		
	ŋ̥												2					
	j													54	55			
	k'											1						
	ŋ		14	16	16	16	18				21	12	22		3			1
	h															1		
	ɦ									1								
?	ø	97	83	81	61	81	76	97	97	95	76	84	72	22	39	93	97	95
晓	Φ												26					
	f						2							27	25			
	v			1										1				
	t																2	
	s					1		1		5	3			1		1	1	
	tʃ'														2			
	tɕ					1	1						1					
	tɕ'											2						
	ɕ	42	42	41	42	39	41	39	39	45	36	35	37					
	j														3			
	k							1							1	2		
	k'	1	1	1	1	1	1				1	1	1	2	1	3	2	1
	n																	1
	x	36	36	37	36	37	34	38		20	20	39						75
	h								40				11	47	43	71	73	1
×	ø	1	1	1		1	1	1	1	1	1	1			5	3	2	2

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	SF	NC	MX	GZ	XM	CZ	FZ
匣	p'													1				
	Φ												45					
	f					11					36			47	1			
	v			2						37				7				
	tɕ			1	1	1	1				1							
	ɳ			2														
	ɐ	38	36	32	37	31	31	26			22	2	14					
	j													2	12			
	k	1				1		1			1	1	1	1		11	6	7
	k'	1	1	1	1	1	1	1			1	1	1	1	2	2	4	1
	g								2	1								
	n								2						2	2	2	3
	x	84	85	88	85	90	81	92		5	61	15						95
	ɣ												105					
	h								4				54	67	62	89	92	2
	ɦ								95	81								
ɣ	ø	3	5	3	1	3	2	6	24	1	3	3	10	10	48	23	23	20
云	m																	1
	v			1	14					11				15				
	l		1															
	ʐ	1																
	ɐ	2	2	2	2	2	2	2			2		2					
	j													24	18			
	k															1		
	x											1						4
	ɣ											2						
	h													2	2	5	8	
	ɦ								11	29								
ɣj	ø	38	38	38	25	39	39	39	30	1	39	38	38		19	35	33	36
以	m																3	3
	v			3	2				2	2				3				
	t				1								1					
	l		5					1					1			3	1	
	r					1												
	ts					1												
	dz														2			
	s														1	1		4
	z				1		2		1	1							10	
	ʐ	5									2							
	tɕ	1	1	1			1	1	1	1	1		1					
	tɕ'	1	1	1	1	1												
	ɳ					1		1			1	1	4					
	j													80	77			
	k													1	1	1	1	1
	k'						1	1								1		
	g															1		
	ŋ																1	1
	ɣ									1								
	h															5	1	
	ɦ								1	77								
∅	ø	77	77	79	79	81	80	81	77	2	80	81	78		6	70	66	75

(Continued)

		BJ	JN	XA	TY	HK	CD	YZ	SZ	WZ	CS	FS	NC	MX	GZ	XM	CZ	FZ
米	t				1	1					1				1		2	
	tʻ												1					
	d						1											
	n	2	1	2	1	166	164	2		2	162	164		1		9	9	1
	l	166	166	165	167			166	166	165	2	1	162	166	167	157	157	167
	ȵ		1	1			3		1	1	3	3	2	1				
	g															1		
l	θ					1												
日	v			13														
	n					26									1	4	5	5
	l		12					33						28	1	7	1	9
	dz															30		
	s						1											
	z				39		39	24	15								34	
	ʐ	39	25	25						18								
	j													24	42			
	ȵ							14	9	2	4	5		15				
	g															1		
	ŋ																	2
	h															1	1	
	ɦ									13								
鼻	0	4	6	5	4	17	4	9	5	3	23	39	10	2			1	27

On the Progressive Palatalization of Early Slavic:
Synchrony versus History

Horace G. Lunt

Late Common Slavic, as represented by Old Church Slavonic (a fairly standardized written form of SE [or Balkan] late ComSl dialect attested for about 1000) along with the reconstructible dialects of the 8th-9th centuries in the whole Slavic area, exhibits parallel alternations c $č$ k and dz $dž$ g which clearly derive from velar stops in a satem dialect of late IE. The most pervasive alternation shows regressive palatalization before any front vowel or yod: $k/g > č/ž$ (1st Regressive Palatalization, dubbed KI). Historically later is the 2nd Regr. Pal. (KAI), whereby $k/g > c/dz$ before the "new" front vowels i and $ě <$ earlier ComSl *ai. Synchronically, both are active processes in inflection and easily handled in structural or generative description as underlying k/g.

In a third type of environment, stem-final c/dz must be derived historically from k/g affected by a preceeding high front vowel – a progressive palatalization (called BdC). Slavists, agreeing KI is prior, disagree otherwise: KAI-BdC or BdC-KAI? Lightner, proposing a generative description with very abstract underlying representations, put BdC first: BdC-KI-KAI. This paper concurs, but insists that since BdC must be one of the earliest processes of Slavic as it began to differentiate from dialects which gave rise also to Baltic, it took place before a distinctive $/x/$ existed, and therefore the parallel treatment of stops and continuants (k c $č$ $\simeq$ x s $š$) is a subsequent structural development.

1.   In the early 1960's, the new generative theory of linguistic description was being tested on the basis of the materials of many languages. At MIT, thanks to Morris Halle, students were encouraged to work with Russian and other Slavic languages. Surely the most enthusiastic and productive member of the group whose major field was Slavic was Theodore Lightner, who studied Old Church Slavonic and Comparative Slavic Linguistics with me at Harvard in preparation for his projected generative analysis of Contemporary Standard Russian. He avidly read the standard works and was particularly impressed by Antoine Meillet's insightful use of internal reconstruction both for the elucidation of various historical stages of the languages and for comparison with related Indo-European dialects (cf. Lightner 1966). Never a passive auditor in a class, Ted constantly spotted problems and demanded answers to all sorts of questions. My own structuralist views had been formed primarily under teachers with varying blends of Sapir and Bloomfield in their backgrounds, before I spent a year in Prague, 1946-47. Subsequently, as a student and associate of Roman Jakobson's, I had slowly revised my descriptive and historical view of the major problems of Slavic. It was disconcerting to discover that Ted's persistent questions too often revealed tacit premises of dubious value, or even gaping holes in explanations that had formerly seemed quite satisfactory.

Many of Lightner's proposals could be rejected out of hand on the basis of information he had not yet acquired, but others required adjustments of traditional views in small but important ways. The close correspondence of Lightner's proposed generative descriptions of Old Church Slavonic and Russian to putative historical change was a bone of contention. Ted advocated a degree of abstraction in his underlying phonological systems that seemed to me to minimize – if not obviate entirely – history. Yet he forced me to confront all the old problems and to rethink major questions. The most important change he impelled me to make had its beginning one sunny day in 1963 or 1964 when, in a brief chance encounter near the Harvard Library, Ted announced categorically that he

had "solved the problem of the progressive palatalization." His solution, of which I was apprised later, defied tradition and was unacceptable to me. His rule of progressive palatalization was among the very first of the many ordered rules required for generating OCS from his hypothetical underlying representations, and he claimed that this was serious evidence for regarding the historical phonological change as being very old. The handbooks unanimously put this change as late, and I was not inclined to contradict them. But when I undertook my own generative analysis of Old Church Slavonic, I found I was led to the same conclusion. Surely, I thought, this had to be a case where the generative description simply could not correspond to the historical sequence of phonological changes. Though Robert Channon, using rules devised by Lightner and Halle, had undertaken a more comprehensive survey and concluded that the descriptive and historical ordering of rules was indeed the same, I remained skeptical. I continued to feel certain that broader historical and comparative data would vindicate the traditional historical views. My research proved the opposite, as I have shown (Lunt 1981); Lightner's insights were basically correct.

Scholars, however, are reluctant to relinquish doctrines which are repeated in every handbook. At least one prolific Slavic linguist has failed to comprehend the issues and my discussion of them (Kortlandt 1984), so I should like to sketch the main theses once more. Let us start with the basic phonological data which must be handled by descriptivists and historians of Slavic.

2.1 Old Church Slavonic, and presumably its sister-dialects of Late Common Slavic in the 9th century, was a language of open syllables. Constraints on sequences of C+V establish four groups of consonants: (1) *p b t d s z w m n l r*, (2) *k g x*, (3) *j ń ļ ŕ; č š ž *tj *dj*, and (4) *c dz*. In Table I, the palatals are subdivided to facilitate the discussion of morphophonemic and historical relationships of *č *ž *š with the velars on the one hand

Table I

1	si	sy	su	sь	sъ	se	so	sě	sa	sę	sǫ	1
2	–	ky	ku	–	kъ	–	ko	–	ka	–	kǫ	2
3a	ńi	–	ńu	ńь	–	ńe	–	–	ńa	ńę	ńǫ	3a
3b	či	–	ču	čь	–	če	–	–	ča	čę	čǫ	3b
4	ci	–	cu	cь	–	ce	–	cě	ca	cę	cǫ	4
back	–	+	+	–	+	–	+	–	+	–	+	back
high	+	+	+	+	+	–	–	–	–	(–)	?	high
tense	+	+	+	–	–	–	–	+	+	(+)	(+)	tense
round	–	–	+	–	?	(–)	(+)	(–)	(–)	(–)	?	round
nasal	–	–	–	–	–	–	–	–	–	+	+	nasal

and the hissing affricates on the other.[1] The lower portion provides distinctive-feature definitions of the vowels in each column. For some phonemes, certain features were redundant. The ъ was rounded in western Macedonia and the East Slavic area, unrounded elsewhere. The ǫ was rounded and non-low in a broad central region (including East Slavic, Czecho-Slovak and Sloveno-Serbian), but unrounded and non-high

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1. *Palatal* is defined as /-anterior -back/, which includes the /+coronal/ hushing sounds, while the hissing dental affricates must be /+anterior/: if "soft", they must be /+high/ and therefore *palatalized* (not palatal!), see Lunt 1981 72. The important point here is that the consonants of groups 3 and 4 behave differently. (In this article, the term *palatalization* is used exclusively in the sense 'change from nonpalatal to palatal'.)

in the northwest and southeast (including most of the Bulgarian lands). The $*_e$ was surely non-high, and probably [+low] in most regions. Rounding was probably nondistinctive for *o* and irrelevant for *ě/a*. The nasal vowels were doubtless [+tense].[2]

2.2 An over-arching problem of both Slavic and Indo-European historical phonology is to elucidate the many steps by which five hypothetical late IE *satem*-dialect obstruents, **k *g *k̑ *g̑ *s*, produced ten OCS units (the *s z* of group 1, the *k g x* of 2, the *č š ž* of 3, and the *c dz* of 4). The task of linguistic historians is to establish plausible and reasonably distinct sequences of change, taking careful account of the intimately intertwined morphological and morphophonemic processes at various historical stages.[3] But, surely, all speculation has as its aim to account for the phonetic and morphophonemic system of OCS and its sister-dialects of the 9th-11th c. The whole network of speculation must deal plausibly with the observed morphophonemics of OCS, which, unfortunately, contain some points that have caused needless confusion.

The *č* and the *ž* (which alternates with *g*) of Old Church Slavonic are, as everyone agrees, the historical reflexes of **k/*g* followed by a front vowel or iod at a relatively early stage in the development of Slavic; let us symbolize this regressive palatalization as KI. Similarly, many instances of units transcribed *c/dz* and taken to be hissing affricates are derived from old velar stops followed by front vowels which developed from **ai* < **oi*, **ai* in a chronologically later regressive palatalization we may symbolize as KAI. Some instances of *š* and *s* are related to *x* in the same way, and interpreted as resulting from KI and KAI. The rough practical rule for students of OCS is "velar followed by a front vowel is subject to KI (*k g x ~ č ž š*), UNLESS that front vowel is the suffix-initial *i* or *ě* of the imperative or a declensional desinence (excluding *i*-stems), which specifies KAI (*k g x ~ c dz s*)".[4] Thus *otrok-ъ* 'boy', *bog-ъ* god', *dux-ъ* 'spirit' have non-hushing stem-final consonants in Np *otroci bodzi dusi*, Ls *otrocě bodzě dusě*, but hushing consonants in Voc *otroče bože duše* (and derivatives like *otročištь* 'child (dim.)', *božьstvo*

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2. Note that *tense* is not identical with *long* in distinctive-feature terminology; *pace* Panzer 1982, I agree with Trubetzkoy in defining the vowel system of OCS without reference to distinctive length. To be sure, I believe that length and some sort of tonal features must have been present, but the prosodic features were not written (with the possible exception of the Kiev Sacramentarium), and I consider it unwise to impose speculation about these doubtless complex systems on the fairly certain segmental phonology we can derive from the written documents.

3. Kortlandt speaks of "reconsidering fact and fiction against the background of previous work in the field" (1984 217). Let us not forget that the first items we can call facts are the spellings of OCS. IE, with all its details, remains fiction, based on speculation. The ten OCS obstruents here are reasonably solid facts – though not totally unproblematical (see §6.2, below). The five proposed late IE consonants represent commonly-assumed units, but anyone is free to conjecture variant series.

4. Notice that this common-sense statement reflects the historical chronology. More "scientific" formulation requires that the restricted change (KAI), which takes place only in the presence of specific morphemes, be ordered before the general "otherwise" (KI), for the simple reason that no formal convention expressing *unless* has been devised. Unwary students can delude themselves into thinking that an elaborate formal statement of this descriptive ordering has something to do with the history of OCS (cf. Lunt 1981, n. 63). A generativist approach allowing rather abstract underlying representations may posit diphthongs for these surface segments (e.g. Lunt 1974 152); traditional historically-oriented descriptions speak of "ě secundum" and "i secundum" to distinguish these morphophonemes (< IE **oi*, **ai*) from normal *ě* (< **ě*) and *i* (< **ī*).

'divinity'). The results of KI and KAI occur in roots, but 9th-century borrowings permit *velar + front vowel* (e.g. *kitъ* 'whale' κῆτος); the results of both continue, however, to apply to stem-final velars in new as well as old nouns, e.g. *eretikъ* 'heretic', Np *eretici*, Ls *eretiče*, V *eretiče* (cf. *grěšъnikъ* 'sinner' *grěšъnici*, *-ъnicě*, *-ъniče*).[5]

The IE difference between *o* and *ā* declensional paradigms on the one hand and *yo* and *yā*-stems on the other is reflected in OCS by "hard" and "soft" variants of the normal masculine/neuter and feminine paradigms. The **y* of the old suffix merged with a preceding consonant, producing palatal sonorants **ń *ļ *ř* and hushing obstruents *č š ž* plus the clusters *št žd* (< **tj *dj*, whose 9th-10th century reflexes differed regionally), i.e. group 3 in Table I. Some of the desinences have allomorphs which differ in the initial (or only) vowel segment: three oppositions merely oppose back vowel to front vowel (*ъ/ь*, *y/i*, *o/c*), but three are more complex (*y/ę*, *ě/i*, *e/u*).[6] Historically this is interpreted as adjustment of the vowel to the preceding iod, complicated by vowel-raising and monophthongization; interpretations of some desinences and endings are controversial.

What concerns us here is that OCS (and by inference earlier Common Slavic)[7] has a large inventory of stems which end in *c* (mostly formed with productive suffixes such as *-ьc-*, *-ic-a*, *-ьn-ic-a*) e.g. *otьcь* 'father', *srъdьce* 'heart', *ovьca* 'sheep', *měsęcь* 'moon, month', and a handful of stems in *dz*, e.g. *kъnędzь* 'prince'. These are "soft-stems" which require the "soft" allomorphs of desinences that developed regularly after **j*. Jan Baudouin de Courtenay pointed out that this sort of *c/dz* must be explained as earlier **k/*g* preceded by a palatalizing element.[8] Let us call this progressive palatalization BdC.[9]

The *c/dz* resulting from BdC is subject to KI if followed by a front vowel or iod

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5. These alternations are alive today, with varying distributions, in Serbo-Croatian, Czech, and Ukrainian. They have long since been eliminated from Russian nominal inflection, however. For OCS, Lightner's description had no underlying affricates or hushing palatals, only velar *k g x*. In 1974 I followed, though with misgivings, cf. 1981 14-15. More realistic treatment provides an expanded inventory of consonants for roots, with rules for mutations like *k/č* and *k/c* only in derived environments. The historical problem is to establish when this sort of rule came into being.

6. To avoid misunderstanding, let me be explicit that these definitions come from my synchronic structural account of OCS written in the early 1950's, cf. Lunt 1974 vii-x (for the theoretical framework) and 44-5 (for the morphological context). Further – a tacit axiom in that framework – the alphabetic letters denoting phonemes are to be regarded as shorthand for the appropriate bundles of distinctive features. *Desinence*, in this paper, will be used only to refer to declensional case-number(-gender) suffixes. The *i* of Nsf *mati* 'mother' is not a desinence in this sense, but the *i* of Ds *materi* is.

7. The term *Common Slavic*, as I use it in this paper, means from OCS and the hypothetical 9th-10th century dialects of Late ComSl back through (Middle) ComSl – the formulas used in etymological dictionaries (basically OCS with liquid diphthongs and **tj *dj* restored) – to the conjectural early system of a late IE dialect which has "satem" **s/*z* opposed to the **š/*ž* of Baltic and probably different reflexes of **s* after **i *u *r *k*. Here we need not attempt to separate out earlier Proto-Slavic and/or Pre-Slavic (as in Lunt 1981 41), see also Lunt 1985a, 1985b.

8. The relevant section of Baudouin's 1894 article (*IF* 4.45-57) is reprinted in Channon 1972, 51-55.

9. The lone example cited to show BdC affecting **x* is the somewhat aberrant soft-stem pronoun *vьsь* 'all', which we will treat later on. BdC will be discussed as though applying only to original velar stops.

in derivation, thus *mĕsęcь* (with the "soft" allomorph of *ъ/ь*) but the adjective *mĕsęčьnъ*, *srьdьce* (desinence *o/e*) but *srьdьčьnъ*. Although these are "soft-stems", the masculines normally call for the "hard" allomorph in the vocative *e/u*, and the "hard" desinence, being in fact a front vowel with no special morphological marking, requires KI: therefore *otьče* and *kъnęže*.[10]

3.1 The specific problem of the progressive palatalization of early Slavic[11] has two major components:

1. What were the conditions that led to the development of the morpheme-final *c/dz* of 9th-10th-c. Slavic?[12]
2. What is the chronological place of BdC in a sequence of changes that include KI and KAI, monophthongization, and certain hypothetical processes needed to account for the ComSl shape of desinences?

It has been taken for granted in handbooks that KI preceded both KAI and BdC, but the more common belief that BdC is most recent has been challenged frequently. André Vaillant, in the first volume of his comprehensive *Comparative Grammar of Slavic*, reverted to an 1889 decision by the Russian linguist A. I. Sobolevskij that, inasmuch as both must be late and the results are identical, KAI and BdC are in fact facets of a single process.[13] Since 1950, some investigators have spoken of overlapping chronology for KAI and BdC, others favor one or the other as prior, while Frederik Kortlandt has endorsed the notion of simultaneity.[14]

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10. However, the most innovating of the OCS manuscripts, the Suprasliensis, has *knęzu* (presumably with "soft" **ź* to justify the "soft" allomorph, see § 6.2 below) alongside of *knęže* in the same dialogue, cf. Vaillant 1964 89.

11. Examples of late and local progressive palatalization (e.g. R dial. *Van'ka > Van'ťa*, Bg. dial. *majka* 'mother' > *majťa*) must be excluded from the data pertinent to BdC (Lunt 1981 71). In terms of general linguistics, progressive palatalization of velar stops is far rarer than regressive palatalization (including iotation) of velars or dentals.

12. The fact that the velar is ALWAYS the last segment of a morpheme means that it always stands precisely in the position most subject to variation, for it may be followed by derivational and inflectional suffixes of varying phonetic (and morphophonemic) shapes (Lunt 1966 88, 1981 15).

13. Vaillant 1950 53-55. Robert Channon reports Sobolevskij's opinions at the beginning of his efficient survey of the arguments and conclusions on BdC to about 1965 (1972 15-38). His manuscript was in the hands of the printer when Maria Jeżowa's monograph appeared; she provides her own brief survey (1968 7-15).

14. Kortlandt assumes an atheoretical stance that is expressly post-generative (which in fact means anti-generative), in effect simple atomism with a number of tacit assumptions that remain unclear. His information, on the whole, comes from standard handbooks, and he demonstrates little patience with more specialized discussions and no inclination to seek fresh data.. His odd little 1984 paper (which I analyze in greater detail, with remarks about related articles of his that he cites, in Lunt 1986) is based on a superficial reading of my 1981 book, and his reasoning about BdC is simple. "As far as I can see, the final statement on the conditions and chronology of the Slavic progressive palatalization has been reached by A. Vaillant (1950: 53-55)." *Because* Vaillant's formula is true, Kortlandt implies, we necessarily must accept specific consequences "for the relative chronology of sound laws" (1984 211). All this being so, Lunt is wrong because he did not accept precisely the points Kortlandt believes to be correct. His note 2 (211) gives the names of Channon, Jeżowa and Lunt, but otherwise the former two authors appear only in the bibliography. For matters other than palatalization, C. L. Ebeling and F. V. Mareš are cited and Henrik Birnbaum and George Shevelov mentioned *en passant*, but Kortlandt has completely ignored all post-1950 views of BdC except for mine. Why?

The notion that BdC might have preceded the regressive palatalizations was first proposed in 1963 or 1964 by Theodore Lightner, as I remarked above. His "proof" consisted of his proposed generative description of modern Russian and did not convince me at all. Robert Channon's historical survey (his 1965 Ohio State Master's Essay, published belatedly in 1972) argued more persuasively that not only the generative descriptive order but the historical order had to be first BdC, then KI and KAI. Yet even after my own cautious application of traditional techniques of internal reconstruction affirmed the priority of BdC, I was still inclined to believe that this was an artifact of the method[15] which would be corrected when comparative data from outside OCS were adduced.[16] It took a thorough review of the evidence to convince me that the unanimity of the handbooks had no serious foundation.

Three oft-repeated considerations had to be cleared away in order to see precisely what data could be adduced as serious evidence for relative and absolute chronology of BdC and KAI. First was the prejudice that KI must be older than BdC because it appears to affect the c/dz which arose from BdC (Gsm *otьca* 'father' but Vs *otьče*, poss. adj. Gsm *otьčа*). This is a descriptive illusion. Synchronic description requires a rule shifting k to $č$ under the same morphological conditions which must specify $c > č$ (cf. Gsm *proroka* but Vs *proroče*, adj. Gsm *proroča*). The historical change, however, surely was not a direct leap from /+back −coronal/ velar k to /−back +coronal/ hushing $č$. A velar followed by front vowel or j surely did not shift at once to a hushing affricate, but doubtless first became palatal ($k/g > ǩ/ǧ$). Channon (1972 47) pointed out that if BdC had taken place first, then as KI began to operate, the already extant results of BdC were also $ǩ/ǧ$. Before front vowel or j, hushing affrication developed, otherwise hissing affrication developed: *atiǩe *atiǩjā > otьče otьča, while *atiǩā > otьca.[17]

A second prejudice is that loan-words and Balkan and Slovene Alpine toponyms show pre-BdC velars, thus placing BdC somewhere after 600 AD.[18] My analysis of this

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15. Kortlandt in his final paragraph quotes this phrase from my introduction, and says the question "can only be answered by reconsidering fact and fiction against the background of previous work in the field" (1984 217). He fails to report that that is precisely what the rest of my book does. "The issues," he continues, "have been around for a long time, and so have most of the data", adding a footnote, "An exception must be made for the forms which show *vьz-* [for OCS *vьsь-* 'all'] in the Novgorod birch-bark documents that have been unearthed in recent decades" (1984 217 and n. 10). This is misleading, because two forms, *vzu* and *vze*, have been known for decades; I enumerate also the new-found examples in a discussion of the pronominal stem *vьsь-* (1981 37 and n. 124a). Kortlandt does not report the content of my essay accurately.

16. Internal reconstruction is, of course, the basic tool both of historical linguists like Meillet and of generativists like Lightner. Indeed, Lightner's uncompromisingly rigorous use of this tool, accompanied by equally stern exclusion of historical information or comparative material from related dialects, has led to a much clearer understanding of the complex relationships between synchronic and diachronic elements within a single linguistic system, and helped define just what it is that changes from one historic stage to another. Cf. Lunt 1981 6-7.

17. For Bloomfieldian or Prague description, the OCS possessive adjective *otьčь* 'father's' is surely *otьc-j-,*, a lexical entry /otьc-/ plus the formant /-j-/ (cf. *Pilaštaja* 'Pilate's [wife]' = /pilat-j-/). Comparable problems exist for R *otec* 'father' vs. *otečestvo* 'fatherland' and SC *otac* vs. *otadžbina*, cf. n. 5 above. Abstract generative treatment allows underlying *otьk-* (or the like), e.g. Lunt 1974 190ff. But however we handle the descriptive problem, we must recognize that the historical problem is different.

18. Because these items seem to be tangible proof of absolute chronology, they have continued to be cited (e.g. Arumaa 1976 41, Aitzetmüller 1978 17, summary accounts not known to me when I wrote my book but offering nothing I had not already dealt with). Borjana Velčeva (whose stimulating book impelled me to introduce some last-minute changes in the proof of

corpus of data affirmed that this putative evidence is irrelevant: "there is *no* objective evidence for dating; we can only speculate" (1981 38).

A third consideration, that BdC and KAI "yielded the same results in all Slavic languages" (in Kortlandt's paraphrase of the Sobolevskij-Vaillant view, 1984 211), is not fully accurate (Channon 1972 13-14), and in any case is a weak excuse for not looking more closely at the data and typological parallels. The remarkably different environments of the progressive and the second regressive palatalizations are strong reasons for assuming different chronology until that possibility can be definitely ruled out, cf. Lunt 1981, n. 10.

3.2 Recent opinion has agreed that the palatalizing element in BdC was a nondiphthongal high front vowel, which could be followed by a nasal: *Ci(N)__*.[19] Thus *raikā* would not fulfill the conditions, but *mēsinkā* and *awikā* would; hence OCS *rěka* 'river' with the velar preserved, but *měsęca* 'moon (Gs)' and *ovьca* 'sheep' showing the results of the palatalization. Further, agreement that a following high back vowel prevents BdC requires us to explain the "soft" allomorphs of NAsm *ъ/ь*, Gp *ъ/ь* and Ipm *y/i*: if *grěsьnikъ* and *grěšьniky*, why not "otьkъ otьky"? Vaillant (1950 54) specifically posits Balto-Slavic desinences *-as* (presumably for Nsm) and *-an* (presumably Asm and Gp), which, when his combined BdC/KAI was operative, had not yet undergone "reduction" to *-ŭ* (i.e. OCS *-ъ*).[20] He speaks rather too airily of how the stems like *otьcь* not only eliminate the presumed *k/c* alternation in the final consonant but adapt the desinences to require the "soft" allomorph; no paradigm is set down to show possible stages of this adaptation.[21] Vaillant's model would, however, have *otьc-* in the direct cases of both singular and plural and also in the Gp, which would provide better motivation for generalization of the *c/dz* to all other cases than Kortlandt's hypothetical

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my essay), though maintaining the relative priority of BdC, was troubled by these data (1980 29), although Mareš (1969 62), following a number of other scholars, had rejected them. Subsequently, the detailed investigation by Georgacas 1982 affirmed my thesis that no Greek evidence for unshifted *k* exists. An example like Γαρδίκι (cf. OCS *gradьcь*) shows not [-iki] with a velar, but [-iki] or even assibilated [-ići].

19. Examples with *ьr* or *ьl* are now generally agreed to be irrelevant, for the root-final *c/dz* occur only in verbal formations fitting a clear OCS pattern of morphemic alternation, see note 27 below.

20. Kortlandt knows better (1984 213): "According to the available evidence, the following endings of the *o-* and *ā-*stem paradigms began with a high rounded back vowel *at the time of* (emphasis HGL) the progressive palatalization:" Asm and Gp *-ъ*, Apmf *-y*, Ipmn *-y*. Without mentioning that he is disagreeing with Vaillant, he firmly asserts: "the raising of *o* to *u*" in Asm and Gp *-om* "must be dated to the Balto-Slavic period" (213 §5.1). It would seem that whatever Kortlandt asserts is, ipso facto, "evidence"; other people's views are not worth considering.

21. Only Mareš provided full masculine and feminine paradigms to illustrate his proposal, and he did so only in the 1956 edition of his comprehensive history of early Slavic phonology (*Slavia* 25 467, in §42; cf. 1969 60). He posited unshifted velars in masculine Ns, As, Ap, Gp and Ip (with ?), and in feminine Gs, NAp and Gp, at a chronological moment after KI and before KAI. To be sure, five velar forms against ten shifted forms (plus the *č* of Vs) might seem easy candidates for replacement in the masculine paradigm, as Mareš contends (cf. Channon 1972 33), but I submit that the direct cases and Gp are more frequent and the influence of these velars might outweigh the shifted cases. This might favor *k/g* in masculines, but *c/dz* in feminines (and neuters, where by Mareš's rules only Gp would retain *k/g*).

array with its greater number of velar-stem instances.[22]

3.3 Why was **raikā* not subject to progressive palatalization? Vaillant remarks that BdC did not take place after **ai* and **ei* "because" – as Kortlandt paraphrases it – "these did not end in **i* any longer" (1984 211). But Kortlandt leaps from this careful formulation to the conclusion that BdC "was apparently posterior to their monophthongization" (212 §2.2). The generally accepted background premise is that hypothetical early Common Slavic had diphthongs **ai* and **ei* which became OCS *ě* and *i* under normal circumstances. "Any proposal as to the details of the course of monophthongization to *ī* and *ē* (OCS *i, ě*) is of necessity pure speculation, constrained only by typological considerations," I wrote in the sentence preceding my proposal that **ai* lowered its second element before becoming a long low front monophthong (Lunt 1981 19). (Vaillant also kept the diphthong, but transposed it, so **ia > *ea* before monophthongizing.)[23] My proposed DLs **raikai > *raękaę > rěcě* fits the whole complex of my arguments, just as Vaillant's implied **reakea* (positioned in time after KI) fits his. For **ei*, I equivocated, since I found the notion of lowering the second element (**eę*) and then raising both elements to produce the attested *i* (presumably long) was simply ad hoc.[24] Vaillant and I both hypothesize that the older long front vowels eventually absorbed the two diphthongs; our proposals fit both typological considerations and the presumed (Balto-)Slavic data.[25] Kortlandt's early monophthongization introduces – without serious motivation, it seems to me – an interim vowel system that then must be dissolved.

Vaillant and Jakobson assumed metathesis of **ai* partly to bolster the late date of BdC and partly as a parallel to the Baltic metathesis of **ei* to *ie*. In 1981 I rejected metathesis because it seemed unwarranted for **ai*, and I was expecting the two diphthongs to behave in similar fashion. Since then, however, I have concluded that the Baltic development suggests a plausible solution: **ai* has remained (cf. Lith. *atlaikas* 'remainder', OCS *otъlěkъ*) but **ei* often has metathesized (cf. Lith. *mielas* 'dear', OCS *milъ*). Therefore I now suggest that in early Slavic **ai > *aę*, but **ei > *ie*. This fits both typology and my proposed chronology. It is surely preferable to Kortlandt's superfluous long monophthong, and entirely independent of the generative theory that so offends him.

3.4 Traditional history-oriented handbooks have regularly distinguished *ě primum*

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22. Kortlandt should be more forthright about his emendations of Vaillant, and should provide paradigms to illustrate his putative replacements.

23. By neglecting the typological possibilities, not to mention Vaillant's views, Kortlandt is not contributing to scholarly discussion; by failing to consider the context of my proposals (including the explicit details of note 41) he is misleading his readers.

24. Kortlandt has no doubts; he suggests, without argumentation, "that **ei* yielded close *ẹ̄*, which was subsequently raised to **ī*" (1984 212 §2.4). This a priori assumption achieves its goal, but at the cost of creating an intermediate long-vowel system with three front vowels, *ī ẹ̄ ě* and, floating unnoticed in the background, the reflex of **ai*, which in Kortlandt 1979 266 is open **ę̄* (a direct global shift from the diphthong?). Kortlandt fails to realize that in revising the framework he borrowed from Ebeling 1963 (which in turn modifies Van Wijk 1941), he has not really kept track of the details.

25. Channon (1972 29-30) posits **aj* and **ej* and assumes that the non-vocalic segment blocks palatalization. This is implausible, since the glide has to be /+high -back/ with precisely the features which favor palatalization.

(from *ē) and ě *secundum* (from an older diphthong), but modern attempts at purely synchronic description run into difficulties because they confuse the surface taxonomic phoneme /ě/ with the two different items ě¹ and ě², which behave differently in morphology and thus must somehow be kept separate when discussing the morphophonemic system. Let us recall the distributional facts of Table I and look at some morphophonemic facts which historians must account for. Observe first that the "synharmonic" principle (often cited as a characteristic of Slavic as opposed to Baltic) is illustrated consistently only by the velars, which occur before the six back vowels but are excluded before all of the five front vowels. Ideally, only front vowels should occur after the palatals, but the actual distribution deviates from this principle in two respects: after palatals, the non-high tense pair ě/a is represented by the back vowel and both nasal vowels occur. This distribution shows a neutralization of the /±back/ feature by a rule specifying /-back/ for three pairs and /+back/ for the /—high +tense/ pair ě/a, but not affecting the nasal pair. The historical changes show fronting for three vowels (ū u o yield ī i e), but retraction for the fourth (ē > ā); any speculation about the details and chronology of these changes (which I dub Vowel Adjustment) must account for these distributional facts. With the hissing affricates c/dz, however, neutralization is restricted only to three vowel-pairs: cě and ca are contrasted in *normalized* OCS and in the vast majority of hypothetical 9th-century dialects.[26]

The phonemic combinations mask the greater complexity of morphophonemic combinations that must be learned by first-semester students of normalized OCS. Given the basic "twofold" character of the most common substantival and pronominal paradigms, one needs a firm knowledge of the desinences (unvarying? hard/soft allomorphs?) and rules of combination. Faced with a noun form analyzable as containing stem-final c/dz + V, one can be certain that cu cь ce cě ca cę cǫ are unambiguous, showing a lexical stem ending in c plus the "soft" (or only) allomorph of the desinence. To demonstrate adequate elementary knowledge, a student must unerringly recognize, for example, that grěšьnica and grěšьnicě are different. The former is unambiguously Nsf 'sinner', consisting of a lexical stem ending in -c- and the desinence -a, presumably reflecting older *-īk-ā with the expected action of BdC. The latter is equally unambiguous, but more complex: this is Lsm of the "hard-stem" grěšьnik- plus the

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26. What needs elucidation is precisely how the "drift" toward synharmonic syllables was manifested in different regions, e.g. Bohemia, where we may posit *ca > *cä in a late (9th-c.?) neutralization that is absent from normal OCS. Indeed, the spellings of OCS (plus the evidence of most later Slavic dialects) constitute the chief bar to Mareš's theory that BdC was caused by a progressive fronting of a non-high back vowel (ika > ikä); the new front vowel caused fronting of the velar (> ikä), then assibilation > icě (1969 58-9). However, cě-spellings for normal ca are extremely rare; even Mareš's example děvicě requires an asterisk. Against the background of earlier and later history, such spellings are not archaisms, but dialectisms pointing to later Czech (as in the Kiev Sacramentarium) or certain local Balkan dialects (cf. Lunt 1981 68 n. 61; more details in Velčeva). Van Wijk's OCS paradigms (1931 168, 179) unfortunately legitimized these atypical innovations, misleading investigators who read handbooks but not texts. Trubetzkoy's heterogeneous book rightly contrasts "Urkirchenslavische" ca to cě (1954 87) as a general principle, but unwarrantedly posits ä for both in the detailed table of desinences (118), cf. Lunt 1981 54-5. Van Wijk's seminal 1941 paper (written shortly before his death and published posthumously) presents matters correctly in terms of the latest phonological theory (1941 299-300); unfortunately it is his earlier handbook which is quoted usually.

variable desinence *ĕ/i*; the stem requires the "hard" allomorph *ĕ*, which in turn requires KAI-mutation of the stem-final velar. OCS *ca* versus *cĕ* invariably reflects a stage *after* both KAI and BdC, for *ca* can have arisen only by means of progressive palatalization of the consonant,[27] while *cĕ* unambiguously shows **kai* affected by (1) monophthongization (or else Vaillant's metathesis) and then (2) KAI.[28]

The OCS form *grĕšьnici*, however, IS ambiguous: it could be Npm "hard" *grĕšьnik-* + the invariable *i* which is specially marked to ensure that *k* is replaced by *c* rather than *č*, or else it could be DLsf (or NAd) of the feminine *grĕšьnic-* with the "soft" allomorph of the *ĕ/i* desinence. Both desinences go back, scholars generally agree, to a Slavic diphthong **ai*; the Npm having somehow become phonemically (but not morphophonemically) indistinguishable from *i* < **ī*, the usual development of the diphthong (touched on above) being *ĕ* normally but *i* after palatal. This last effect surely was brought about by the Vowel Adjustment which fronted the non-low vowels after iod, so that **jai* > **jei*, and then every **ei* > *i*. Four possible processes are thus assumed: Vowel Adjustment (VA), monophthongization (Mono),[29] and a progressive and a regressive palatalization (BdC, KAI). The ordering BdC, VA, Mono, KAI produces Ls *otьci* and *grĕšьnicĕ*, while VA, Mono, KAI, BdC would yield the unattested (and unwanted) "otьcĕ" along with the acceptable *grĕšьnicĕ*.[30] Advocates of the latter sequence of changes must then declare that the real forms of the type *otьci* (Lp *otьcixъ*) represent regularization of the paradigm (except for the vocative, which is never mentioned in this context) to fit the palatal stems.[31]

Further, first-semester students of OCS must learn that *ĕ* occurs in certain morphemes where it alternates with *a*. This *ĕ/a* morphophoneme does not occur in declensional desinences, but it is found in several derivational suffixes. Historically, it invariably goes back to the old monophthong **ē*; being a front vowel, it triggered KI, but then lost its fronting after the new palatal consonant (and iod), so that old **kē* vs. **kā* > OCS *ča* vs. *ka*. No inflectional desinences began with this **ē*, but certain derivational

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27. Or, in verbs, by a morphologized mutation-rule, e.g. *navycaj-* 'learn' (cf. *vyknǫ-* and *nauči-*), based on the alternation established by BdC in verbs like *naricaj-* 'call' (cf. *narek-*), see Lunt 1981 23-4.

28. A class of possible exceptions is the non-singular imperatives *rьcĕte, pьcĕte sę, tьcĕte, *žьdzĕte* from *rek-* 'say', *pek- sę* 'worry', *tek-* 'run', *žeg-/žьg-* 'burn'. There is no satisfactory explanation of the root-vocalism (Vaillant 1966 §477): is ancient **pik-o-i-te* > **pikaite* to be posited? If so, I am inclined to believe that the *-ĕ-* in these verbs is a morphological replacement (cf. *sĕcĕte, oblĕcĕte, vrьdzĕte, modzĕte*, to *sĕk-* 'cut', **ob-welk-/*ob-wьlk-* 'dress', **werg-/*wьrg-* 'throw', *mog-* 'be able'), part of a restructuring of the imperative in Late ComSl, whereby *-ĕ-* expanded beyond its original domain, cf. Lunt 1981 23 and n. 64, also 1974 §7.21. Kortlandt harbors no doubts; *rьcĕte* is the only legitimate form and, if it existed (apparently according to his positive knowledge) all over the entire Slavic area in prehistoric times, 1984 215 §10.

29. The changes of **ai* > *ĕ*, **ei* > *i*, and **au* > *u* need not be simultaneous, but for this discussion I exclude the latter two except for the **ei* < **ai* after palatals. See below.

30. That is, **ikai* ~ **eikai*: then either (a) BdC **ikaę* ~ **iekaę*, VA > **ikei* ~ **iekaę*, Mono > **ikī* ~ **īkē*; or (b) VA, Mono **ikē* ~ **īkē*, BdC ****ikē* ~ **īkē*.

31. This logic would also produce unattested DLs and NAd feminine "grĕšьnicĕ", but its advocates do not always specify such unwanted items that must be replaced somehow. In particular, as I remarked above, neither Vaillant nor Kortlandt provides explicit paradigms showing regular BdC/KAI developments as opposed to analogical replacements.

suffixes did. Thus the OCS stative formant $\check{e}$ (e.g. in $s\check{e}d\check{e}ti$ 'sit'), correlated with present-formant i ($s\check{e}dit\mathfrak{v}$), corresponds to the a which is preceded by a palatal consonant (cf. $stojati$ 'stand', $le\check{z}ati$ 'lie', pres. $stoit\mathfrak{v}$, $le\check{z}it\mathfrak{v}$), from $^*s\bar{e}d\text{-}\bar{e}\text{-}$, $^*stoj\text{-}\bar{e}\text{-}$, $^*leg\text{-}\bar{e}\text{-}$.[32] The older suffix $^*a$, on the other hand, invariably remains as OCS a, sometimes reflecting the BdC-based mutation mentioned in note 29 above, sometimes retaining the velar: $dvign\varrho ti$ 'raise' with $dvidzati$, but $te\check{s}ti$ (morphophonemic $tek\text{-}ti$) 'run' with $t\check{e}kati$.[33] In taxonomic phonemic terms, OCS a is opposed to $\check{e}$ after all non-anterior consonants (Table I). Morphophonemically, /ě/ is correlated with /a/ in some morphemes, but with /i/ in others (Lunt 1974 §3.410): it is this different behavior that has required the labelling $\check{e}/a$ ($< \bar{e}$) "ě primum" vs. "ě secundum".[34]

3.5 The noun $^*j\mathfrak{v}go$ 'yoke' $<$ IE $^*yugum$ is generally cited to demonstrate that the front vowel $^*i$ ($> ^*\mathfrak{v}$) developed posterior to BdC.[35] If BdC was a late phenomenon, VA must also be very late. The assumption that BdC was early removes this awkwardness, allowing much more time in which VA might have operated.[36] As for the feature /round/, Kortlandt's assumption of significant labializations and delabializations in the history of early Slavic is unnecessary. I hold that neither delabialization nor labialization is of great significance until the eve of the historical era,[37] when the u of attested Slavic

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32. The $\check{e} \sim a$ alternation within roots (e.g. $\text{-}l\check{e}z\text{-} \text{-}laz\text{-}i\text{-}$ 'clamber') is not part of the active derivational and morphological structure of OCS, but etymologists reckon with the possibility that attested $\check{c}a\text{-}/\check{z}a$-roots are historically related to $ka\text{-}/ga\text{-}$ forms, e.g. $\check{z}as$ 'fright' and gas 'quench'.

33. The contrast $tek\text{-}$ $t\check{e}k\text{-}a\text{-}$ illustrates a change of he root-vowel e to $\check{e}$ that is a normal component of this formation (Lunt 1974 §5.712). After a velar it automatically is reflected as $e \sim a$ ($\text{-}\check{c}ez\text{-}n\varrho\text{-}$ $\check{c}az\text{-}aj\text{-}$, §5.713).

34. A series of puzzles concerning certain OCS spellings and developments in various later dialects renders the matter far from straight-forward, a fact which motivated the addendum, "On $\check{e}$ versus a", to my essay on BdC, 1981 53-56. Kortlandt demonstrates that he really does not understand the difference between the synchronic system of OCS with its mildly complex morphophonemic alternations and earlier systems with their simpler alternations. He states his misunderstanding in 1984 212 §2.5, and affirms it a second time: "If we take the evidence at face value, it is clear from the phonemic contrast between a and $\check{e}$ [sc. "ě2", HGL] after the soft consonants which resulted from the progressive palatalization [BdC, HGL] that the backing of $^*\bar{e}$ [sc. "ě1", HGL] to $^*\bar{a}$ was anterior to the rise of these consonants. Since the backing of $^*\check{e}$ to $^*\bar{a}$ was posterior to the first regressive palatalization [KI, HGL], it follows that Lunt's chronology cannot be maintained" (§10 215). Kortlandt's formulation of Mono saddles him with a merger of $^*ai$ and $^*\check{e}$ (cf. n. 23 above) whose consequences he has not calculated. Kortlandt's views of how phonemic versus allophonic details affect phonological change are fuzzy. Old $^*ai$ is envisioned as becoming an $^*\check{e}$ which "did not cause palatalization in spite of the fact that it tended to be more fronted than $^*\check{e}$ from earlier $^*\bar{e}$" (1979 266). Fact? Tended?

35. Kortlandt complains about my treatment of this example because he cannot understand that I consider Slavic $^*u$ $^*\bar{u}$ to have been fully defined as /+back –high/, with specifications for rounding (though very probably different at different times) phonologically irrelevant. (He apparently rejects the view, common since Trubetzkoy 1929, that vowel systems often specify $either$ /back/ or /round/, but not both.). Indeed, his discussion indicates that he did not really read the relevant passages of my book, see Lunt 1986 §3.4.

36. The interpretative problems suggested above in note 26 are to be attributed to the persistence of varying forms of VA as morpheme-constraining rules in different dialects in time and space.

37. The distinction of pre-Slavic o $\bar{o}$ and a $\bar{a}$, I suggest, crucially involves the status of the feature /low/ (cf. 1981 n. 78); I know no compelling reason to insist on distinctiveness for rounding. If it is desirable to connect the $\text{-}y$ of Nsm $kamy$ 'stone' with the $^*\text{-}\bar{o}$ of Baltic, one can posit $^*k\bar{a}m\bar{o}n$ and an early raising rule applying only to rounded vowels and thus not affecting the Asf desinence $^*\text{-}\bar{a}m$ (1981 n. 144), but at least one alternative solution exists (cf. 1981 n. 143).

finally evolved from older $*au/*ou$.[38]

4. What about possible restrictions on the vowel following the velar in the BdC environment? Accepting the usual presumptions that a high back vowel blocked BdC[39] and that any front vowel triggered KI, BdC then must have been favored by non-high back vowels. The parade examples of BdC come from the most common declensional types, descended from masculine and neuter o-stems and feminine $\bar{a}$-stems. I start from the simple – indeed almost tautological – premise that *all desinences began* at some time *with a non-high back vowel*.[40] I propose, then, (1) that BdC started as a phonetic process of progressive assimilation in that period, whenever·it may have been, and (2) that all other prehistoric phonetic processes of Slavic should be examined in the light of this possibility.[41] As long as any proposed desinence begins with a non-high vowel, its exact

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38. Kortlandt expostulates, "it is highly improbable that a system without rounded vowels would have survived over 2000 years of linguistic evolution" (1984 212 §3). As in some other cases, he knew in advance what I should have said, and did not read what I wrote. It is he who believes in 2000 years of "Slavic"; he puts it back to 1000 B.C. (1982 181). I wrote: "BdC may have started as far back as the 2nd or 3rd century, or not until the 7th. Yet we must bear in mind that we cannot date the final phase of the change of IE $*k/*\acute{g}$ to Slavic $*s/*z$, nor the backing of IE $*s$ to early Slavic $*X$ – changes I connect with the time of BdC – nor yet the subsequent split of $*X$ to late Common Slavic and OCS $*\check{s}$ and x. [...] We may speculate that BdC was still productive even after KI began to operate, but this too fails to provide an absolute date. [...] But let me emphasize once again that there is *no* objective evidence for dating; we can only speculate. [...] BdC took place in the transitional period when the language could be taken either as a dialect of late IE or a new structure, early Common Slavic" (1981 38). Subsequently I have argued that ComSl is a product of the Avar period, ca. 550-800 (Lunt 1985a, 1985b).

39. The restriction refers only to the ancestors of OCS ъ and y. OCS u is generally assumed to have been a diphthong $*au$ (even $*ou$ is acceptable in my view) in whatever period BdC was operative.

40. This point is reiterated in a different context in note 150 (Lunt 1981 85). Kortlandt quotes selectively: "Lunt claims that 'internal reconstruction alone suffices to establish a stage where every desinence in the OCS twofold declension begins with $*a$ or $*\bar{a}$. A number of variant proposals may be made [*Kortlandt substitutes* [...] *for the following:* if one includes information from the IE o-, yo-, $\bar{a}$ and $y\bar{a}$-stem endings in other languages], but nothing changes the major fact: all desinences begin with a low back vowel' (16). This formulation exemplifies another basic device of generative argumentation, viz. the presentation of underlying forms, which are established on the basis of general principles, as major facts of a language. Yet there is no evidence that Lunt's underlying paradigms ever existed as a synchronous system at any stage in the prehistory of Slavic" (Kortlandt 1984 213 §4). Surely the reference to other languages – a reference Kortlandt did not tell his readers about – is incompatible with the notion of synchronic underlying forms, and the definition of the array (Table I, Lunt 1981 17) specifies that it offers sample declensions of the *forerunners* of OCS words. (As for the array itself, it proposes desinences that are to be found in discussions by many scholars for the last century, while notes to the table suggest alternatives). Kortlandt reads carelessly; one must assume that he skipped my methodological statements (1981 6-10), for he confuses my historical approach of 1981 with the synchronic generative description in the Epilogue of my 1974 *OCS Grammar*. Had he worked through pp. 45-51 of my 1981 book, he might have been in a better position to grasp my simple basic proposal.

41. But Kortlandt knows better. His §5, quoted above in note 20, decrees that certain desinences no longer had low back vowels *at the time of* BdC; this prescribed dogma prohibits further discussion. It is a preconceived opinion which, I submit, can properly be characterized as a prejudice, a word I used (1981 61 n. 21) about another scholar's approach to a specific detail, an approach that led to an error very like Kortlandt's failure to distinguish $\check{e}$ *primum* from $\check{e}$ *secundum*. Kortlandt finds that my discussion of this item "in terms of 'prejudice' and 'error' is another example of the generative style" (1984 213 n. 6). Is the accurate use of evaluative terms limited to generativists?

shape has no bearing on the chronology of BdC.

Kortlandt's remarks, aside from his general disregard of what I wrote, are often internally inconsistent. He complains that I disregard "the prosodic evidence, which is crucial for an understanding of the morphophonemic processes" (1984 213) precisely in a case where it seems to me that my analysis does not contradict his.[42] He objects to my supposition that a raising rule applied to certain desinences, since he "has pointed out elsewhere" that some of the desinences were not subject to raising and in others the raising had some different chronology.[43] On the following pages he over-simplifies my statement of other processes and skates past the data I present and my attempts to discuss difficulties.[44] The gist of his remarks is a simple closed circuit: he knows precisely when a common language called Balto-Slavic developed, precisely what common innovations it admitted in what order before a split into Baltic and Slavic evolved, and then precisely how Slavic developed further. There are no open questions left to study, because Professor Kortlandt has pointed out the iron-clad solution to every problem. Any suggestion that there are other possible definitions of Balto-Slavic, other formulations of the hypothetical processes, or perhaps other chronological orderings is met with the answer that it has to be wrong because it disagrees with Kortlandt.

5.   Let me summarize my hypotheses, giving the major changes in order.

(1) *The progressive palatalization (BdC)*, whereby $*k/*g$ > palatal $*\acute{k}/*\acute{g}$, took place if the velar was preceded by $*Ci(N)$ and followed by a non-high vowel. Since every case-form of the masculine-neuter $*o$-stems and the feminine $*\bar{a}$-stems had a desinence beginning with a non-high back vowel, suitable velar-stems acquired $*\acute{k}/*\acute{g}$ throughout the paradigms. This formulation implies that older diphthongs $*ai$ $*ei$ no longer ended in $*i$, and I suggest that the system had evolved modified diphthongs, $*ie < *ei$ and $*a\rho < *ai$. Since the old *i*-diphthongs are included in the i u r k environment for the backing of $*s$ to a dorsal fricative $*X$ in early Slavic and Baltic (later to split into $\check{s}$ and x in Slavic), BdC must be posterior to the *ruki*-rule. The $*\acute{k}/*\acute{g}$ produced by BdC must have arisen after the hissing IE dialectal $*\acute{k}/\acute{g}$ had become hissing affricates (later > $*s/*z$).

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42. Although Kortlandt has written widely on accentology (esp. 1975), there is only rare mention of morphophonemics or, indeed, morphology in those of his works I have read. He talks very schematically either about accent or about some particular kind of segments, usually omitting discussion of how the elements interact. He does not always calculate the consequences of a limited proposal for the total phonological system he is analyzing, cf. Collinge 1985 90, 226.

43. Kortlandt 1984 §9. His frequently cites his 1979 essay "On the History of Slavic Nasal Vowels", which, as I show in melancholy detail (Lunt 1986 §5) is an empty and incoherent string of declarations of opinion which fails to report accurately the content of works cited, makes no reference to alternate possibilities for interpreting the many controversional points that are touched on, and provides no reasoned argumentation – indeed, little discussion. He even has trouble deciding what "nasal vowel" means during the long period he purports to deal with. The article offers no support whatsoever for assertions Kortlandt makes in subsequent essays.

44. A bizarre comment: "The hypothesis that the progressive palatalization was early forces Lunt to reformulate it as a subphonemic development" (Kortlandt 1984 215 §11). Forces? Does not phonemic theory see every historical change starting as a new variant (e.g. Ebeling 1963 27-30)? Ebeling's paper, the source of nearly all of Kortlandt's ideas, posits a late BdC/KAI (Stage VII) with an explicit "phonetic prelude" (Stage VI, 1963 34-5). Instead of muttering darkly about "giving up principled methodology", Kortlandt should tell us just when and why he departs from Ebeling's methods.

(2) *Raising.* The phonologization of the new palatal stops began when certain desinences (let us agree with Kortlandt on Asm and Gp *-om*) were raised,[45] destroying the environment for BdC: e.g. the suffix *-ik-* was non-contrastively *-ik̂-* until *-ik̂-om* became *-ik̂u(m)* and thus contrasting with *-ku(m)* of other words.

(3) *First regressive palatalization (KI).* Before a front vowel or iod, (1) velar *k/*g fronted, becoming phonetically identical to the *k̂/*ĝ of BdC; and then (2) *k̂/*ĝ in this position became hushing palatal affricates č/dž (the *dž̌ > *ž̌ except after *ž̌).

(4) *Vowel adjustment.* The non-low back vowels *u *ū *o fronted after *j (the ancestor of OCS *j and the palatal series of sonorants and hushing obstruents),[46] and under the same conditions non-back *ē backed to *ā; the result is neutralization of the front/back opposition in this position.[47]

6.1 Certain fluctuations of form in OCS and other sources show that BdC fails to account exactly for every early attested form. I regard the oddities as new items, overlying the regular results of a relatively old process.[48] Others have interpreted the deviations as demonstrating that BdC was a late process, deeming it to have been interrupted by social changes during the turbulent events of the ninth-eleventh centuries, leaving a few unchanged remnants and some abortive analogical forms. The many *k*-examples are fairly straightforward, as are the borrowings with Germanic stem-final *-ing-* (e.g. *kъnędzь*), but *ingā 'disease, evil' and the three in *-ig-* are more troublesome: *gabig-* (cf. Goth. *gabigs*) > OCS *gobьdzь* 'productive, rich' (see Lunt 1974 192 for derivatives in OCS); *stigā 'path' (Lunt 1981 31); and *lig-* in *po-lьdza* 'benefit, use' and *lьzě 'it is permitted', which presents difficulties I do not regard as intractable (1981 34-5).[49] A fresh review of the data in 1986 has given me no reason to change my conclusion that BdC is a very early process.

6.2 Though KAI-effects are attested in many roots and stems with *-x-*, the sole example showing the putative effect of BdC on *x is the pronoun *vьsь 'all', as Machek

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45. All raising rules are proposed in order to account for the high vowels of certain Slavic (and Baltic) desinences, and the rules vary according to the various assumptions scholars have advanced for the desinences posited at the hypothetical primary stage and the particular outcome in OCS or other Slavic (and/or Baltic) dialects individual analysts are attempting to account for. In the present sketch, neither the number of different raising rules nor their precise formulation matters: just about everybody agrees that at least one such rule operated very early. For my suggestions, see Lunt 1981 98 (item "vowel raising"). Note that here I accept, for the sake of discussion, Kortlandt's desinences.

46. Let me reiterate that the symbols *u* and *o* denote /+back/ segments, but that rounding is a redundant feature for this system. The *phonemic* change is /+back/ > /-back/, and any possible intermediate *phonetic* [ü] is irrelevant.

47. Van Wijk, in the earliest attempt to apply late Trubetzkoyan phonemic theory to ComSl, recognized this series of problems as neutralization (1941 §4).

48. This is particularly true of *ca dza* verbs, cf. n. 27 above, Vaillant 1966 480.

49. Kortlandt declares flatly that "*lьzě 'permitted', like *trěbě 'necessary' and *godě 'pleasing', is a petrified locative", and "Lunt submits" that it may represent a "distorted" Ns *lьdza (216 §13). Now, he may not have understood my discussion, but I did devote a full page and a half to the proposal that, as the nominative *potrěba* is essentially a synonym of *trěbě, *lьźa may have been a "Moravianism" which for complex philological reasons was spelled *lьzě in all of the five OCS examples. Kortlandt's essays give no hint that he has the skills to deal with philological evidence of 9th-10th century differences within OCS. The key to his disregard of my discussion here seems to be that he recognizes as *evidence* only items he himself adduces.

pointed out in 1958 (cf. Lunt 1966 91). This pronoun's declensional peculiarity of selecting the "hard" allomorph of desinences beginning with morphophonemic *ĕ/*i (thus vьsĕxъ like hard-stem tĕxъ, not soft-stem *mojixъ 'my', našixъ 'our', sixъ 'this') defines a traditional dilemma: is vьsĕxъ historically regular under the assumption that Mono preceded BdC, or are the noun-forms like otьcixъ (and, I may add, grĕšьnici DLs NAd) regular under the assumption that BdC preceded VA and Mono? In either case, if one is regular, the other is analogical. Van Wijk found it unacceptable that the "hard" pronouns influenced vьsĕxъ, since sь has only "soft" desinences.[50] I find it highly probable that pronouns are "likely to develop peculiar innovations along with haphazard rearrangements of old materials, and sь itself is synchronically difficult and historically peculiar" (1981 36).[51] I therefore believe that it is no sure guide to ComSl phonological processes.

Ebeling wittily observes that "the results of phonemic analysis are often inversely proportional to the investigator's knowledge of the language", so that exotic languages rarely pose the severe difficulties every investigator finds in analyzing well-known languages (1959 43-4). It would seem that for Kortlandt OCS is an exotic and transparent system; I perceive problems at every step.[52] He says impatiently that the pronoun vьsь "cannot be compared with sь 'this', which combines a hard stem (which is evident from the West Slavic material) with soft paradigm endings" (1984 216 §14). Too fast. What, in terms of system, is a "hard stem with soft endings"?[53] The fact is that sь in part of its paradigm behaves precisely like synchronic j-stems and like palatal-stems that once contained *j, e.g. *mojь[54] 'my' and našь 'our'.

We need to stand back and look at the inventory of fricatives in OCS and contemporary dialects. Is Table I above sufficient? Surely those dialects which had no dz replaced it with a fricative which still belonged to group 4, so that BdC stems called for "soft" desinences (e.g. Ap *kъnęźę, *stьźę). I submit that ź is a plausible phoneme

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50. I quoted (1981 38) Van Wijk's concise statement of this dilemma from his well-known handbook (1931 68); his later phonological statement is much fuller (1941 307-8). He took for granted that KI had priority; the dilemma for him was whether the order was KI-BdC-KAI or (as his decision on vьsĕxъ determined) KI-KAI-BdC. For Kortlandt, apparently, this sort of dilemma is no obstacle, because his infallible omniscience provides the sole correct decision in every case. For him, his opinions apparently are facts, cf. n. 20 above.

51. Kortlandt quotes this passage only to the comma (1984 216 §14), and comments, "The methodological principle that anything goes surely puts an end to all scholarly discussion." Where did he get "anything goes"? My point, backed up with samples of pronominal oddities in a long note, is that pronouns are not particularly reliable as illustrations of regular sound-change.

52. Ebeling waggishly notes that the analyst's native tongue is invariably the most resistant to analysis, and proposes that Dutch presents the most recalcitrant problems. Let me avow that American English is the most difficult, but OCS – even without native speakers to protest the interference of outsiders – comes close behind.

53. Kortlandt 1983 313 speaks of the soft-stem inflection of sь "in spite of the fact that the stem was undoubtedly hard, as is clear from the West Slavic reflex s- not š-." Too glib! The phonetic/phonemic nature of the prehistoric initial consonant was not necessarily the same at all times, and Kortlandt's assumptions about WSl *š certainly are neither undoubted nor facts. This article is merely a series of declarations of opinion; its main import is that pronominal stems behave peculiarly.

54. The asterisk is necessary for this stem because the OCS writing systems have no symbol for j; moreover there is no device in the surviving texts allowing us to separate *jь from *ji.

for such dialects. Further, the descriptive fact that *sь* and *vьsь* require "soft" desinences (such as *sego semu*, *vьsego vьsemu*, like *našego našemu*, versus *togo tomu*), impels me to see a quality in the "s" of the spelled forms that triggers these allomorphs.[55] One then speculates about the quality of the "s" in forms like Lsm *dušě*, Np *dusi*, from the stem *dux-ъ*. The parallel affricates *c/dz* – whatever their quality in OCS – must have been "soft" (say, /+high -back/) at some point, thus either causing VA or at least morphologically requiring "soft" allomorphs; hence **otroći *otročě *bodźi *bodžě*. And it is unlikely that these affricates were phonetically or phonologically different from those in Np **otьći *kъnędźi* (though some scholars have assumed a difference in "hardness', cf. Channon 27). I suggest, then, that there was a phoneme */ś/ in **duśi *dušě*, phonologically distinct from the */s/ in Np *lisi* 'foxes' or *pьsi* 'dogs' (or Ls *lisě pьsě*).[56] This entails adding *ś ź* to the group 4 consonants – at least for some dialects.

This is not the place to discuss the consequences of this theory, but only to point out that the morphophonemic network of alternations of *k*, on the one hand, and *g x*, on the other, do not coincide in OCS. The relationships of *k, c* and *č* involve stops and an essentially closed group of morphemes: the presence of one in a morpheme allows us confidently to predict the presence of the others under the appropriate morphophonemic conditions. But *g* regularly alternates with the fricative *ž* and, according to dialect, either with the stop *dz* (?*dź*) or the fricative **ź*. A morpheme with *ž* does not unambiguously imply a related *g*, for it could be correlated with *z*. Does the series *g dź ž z* correspond exactly to the series *x ś š s*?[57] How do the units in the latter series interact in various dialects, prehistoric and historic?

Now, since *vьsь* is uncertain as to etymology and age,[58] it is unsuitable as a keystone to a hypothesis. Further, the thesis that BdC was early can mean precisely that there was not yet a velar **x* in the language; the split of **X* (probably [š], from **s* after **i *u *r *k*) into **š* vs. **x* lies in the future. Van Wijk's dilemma disappears because NO case-forms of *otьcь*, *srъdьce* and *ovьca* are analogical.[59] *Vьsь* is a problem involving late ComSl fricatives and the morphology of pronouns; it tells us nothing about BdC.[60]

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55. This morphophonemic view modifies the assumption that the OCS alphabets were "essentially phonemic" (Lunt 1974 §2.05).

56. Van Wijk reached the same conclusion, 1941 300.

57. These complex problems have been discussed, at least partially, from the early days of Prague structuralism, cf., e.g., Havránek, Večerka. Contemporary Polish alternations in the *s ś š z* series are still historically and descriptively troublesome, e.g. *wieś* 'village', dim. *wioska; arkusz* 'sheet' (of paper)', aug. *arkusisko*, cf. Gladney 1985 339-40. In general, progressive palatalization is more common in continuants than in stops, cf., e.g., Ger. *ich* vs. *ach*, [ix] (with dialect [iś, iš]) but [ax].

58. A Balto-Slavic **wiśas* is problematical (Vaillant 1958a 477-8, Aitzetmüller 120; see also Machek 1968 s.v. *veš*). Kortlandt objects to my "questioning the velar origin of the fricative, in spite of the available evidence" (1984 217); this is not reasoned argumentation, but an assertion that depends on his own idiosyncratic belief as to what constitutes *evidence*, cf. n. 49 above. He stubbornly refuses to look at data in different lights, to experiment with alternate premises, to envision multiple possibilities – in short, to admit ambiguities of any sort.

59. Since Kortlandt has not reckoned the consequences of his modifications of Vaillant's proposal nor bothered with attempting to understand my very different hypothesis, his criticism of my "entire chain of reasoning" (1984 217), like his pseudo-agreement with Van Wijk, is simply irrelevant.

60. Channon did not take Machek's isolation of *vьsь* as the sole instance of the putative action of BdC on **x* seriously enough, and thus was vulnerable to criticism based on such examples as *ženixъ* 'bridegroom' and aorists like *xvalixomъ*, with theoretical **-xs-*, as well as diphthongal sequences like **teis/*tais* in *tixъ* 'quiet' and *utěxa* 'comfort'. Removal of **x* from the BdC

7. What are the consequences for the hypothetical early history of Slavic if the progressive palatalization (BdC) is viewed as a very early event? Perhaps most important is that the "tendency toward palatalization", so strongly emphasized by Van Wijk and others as characteristic of Slavic, is manifested by the BdC *$\acute{k}$/*$\acute{g}$ at the very beginning. These /-back +high/ obstruents join *j as syllable-initial units which later effect the neutralization of the front/back opposition that is so important in the vowel system.

BdC must be posterior to the change of satem IE *$\acute{k}$/*$\acute{g}$ to affricates (presumably the pre-Slavic hissing *c/*dz), and to the rise of the dorsal fricative *X, the precursor of Lithuanian *$š$ and Slavic *$š \sim$ *x.[61] Thus, if we compare the old formulas corresponding to OCS *pьsati* 'to write', *pьxati* 'to pound', *sьcati* 'to urinate', and *pьšeno* 'millet', we can posit four early stages: (1) before *$\acute{k}$ has finally become *s, while old *s retracts after *i *u *r *k; (2) BdC; (3) *$s <$ *$\acute{k}$ emerges; (4) *X becomes (or remains) $š$ before iod or front vowel, x otherwise. (3) may well have preceded (2); (4) possibly is related to the first regressive palatalization (KI). In Table II are included also the formulas for OCS *ležati* 'to be lying', Vsf *ovьce* 'sheep!', DLs *ovьci*, Vsm *otьče* 'father!' and DLsf *rěcě* 'river', to illustrate two later stages, (5) Vowel Adjustment and (6) Monophthongization plus the initial stage of KAI.

Table II

Selected changes from late IE to late Common Slavic

IE										IE
IE	*piKātei	*pisātei	*pisena	*sikātei	*legētei	*ouika	*ouikāi	*atike	raikāi	IE
1	*picātei	*piXātei	*piXena	"	"	"	"	"	"	1
2	"	"	"	*sikātie	"	*awiKa	*awiKaę	*atiKe	*raękaę	2
3	*pisātie	"	"	"	"	"	"	"	"	3
4	"	*pixātie	*pišena	"	*ležētie	"	"	*atiče	"	4
5	"	"	"	"	*ležātie	*awiKe	*awiKei	"	*raękaę	5
6	*pisātɪ	*pixātɪ	"	*sićātɪ	*ležātɪ	*awiće	*awićɪ	"	*rěkě	6
OCS	pьsati	*pьxati	*pьšeno	*sьcati	ležati	*ovьce	*ovьci	otьče	rěcě	OCS

8. What about the relationship of Slavic to a more comprehensive Balto-Slavic? Since Baltic did not participate in the palatalization processes or monophthongization, it seems safe to say that after KI and Mono the dialects which underwent these changes were now specifically Slavic (cf. line 6 in Table II). The divergent results of satem-palatalization (hushing *$č$/*$dž$ in pre-Baltic, *c/*dz in pre-Slavic), and the specific BdC development result in differing consonant systems (and distribution of certain phonemes in historically identical lexemes), but the recoverable differences are minor in comparison to those which we observe in contemporary systems that we do not hesitate to class as dialects of a single language.[62] Up to this time such divergent developments may well

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formula changes the problems in many ways and vitiates much criticism (e.g. Steensland 1975).

61. Notice that both *$s >$ *X and BdC are progressive assimilations, the former usually, the latter invariably operating across a syllable boundary. All subsequent changes operate within the domain of a syllable, until the jer-shift (or "loss of jers"), which marks the end of ComSl.

62. Compare, for example, the strikingly different systems (vowels, accents, consonants) in the nine villages classed as Croatian kajkavski by Yugoslav linguists, not to mention the neighboring Slovenian (let alone more remote Slovenian) and other SC dialects in the fascinating volume of Yugoslav phonological descriptions (Ivić 1981). For Bulgarian examples, see Lunt 1985b.

have accompanied common – or convergent – shifts in other domains, especially accent; a label Balto-Slavic is still appropriate. The Common Slavic which can be discerned posterior to VA and Mono soon developed dialects of its own, as *tj/*dj and the liquid diphthongs produced regionally divergent reflexes pointing toward the divisions attested after about 900. I maintain that ComSl is not the end-product of a particular branch of a Stammbaum reaching back to pristine Indo-European, but rather a lingua franca which arose during the Avar period by a blending of many dialects (not all of which need necessarily be "Baltic" or "Slavic") as the Slavs were suddenly galvanized into far-flung migrations and thrust into complex social interaction with new groups of varying cultures and languages. I agree with repeated observations of Slavists, on the basis of many diverse linguistic and cultural studies, that Common Slavic shows no identifiable isoglosses that can be sensibly pushed back even as far as 600.[63]

9. There is, of course, no final answer to the relative chronology of the major phonological changes that led from hypothetical late Indo-European to the hypothetical Common Slavic dialects of about 800. Speculation about these multiple variables must stay within the bounds of specific theories and the plausible constraints set by known phonological systems and typologies. A great deal remains to be done in the period when Late Common Slavic is rapidly fragmenting into new dialect groups and languages that point forward to the recorded systems of the developing local societies after 1100.

10. Kortlandt speaks of "Lunt's desperately agnostic attitude" (1984 217) in weighing alternate hypotheses about these undocumented prehistoric linguistic systems. What does this delightful oxymoron mean? Why should discussion of *any* linguistic problem occasion desperation or despair?[64] What does it mean to *know* a real, observable linguistic system? Our colleagues in biology and physics bring physical data into laboratories and verify their ideas; they see new facts with new machines and devise experiments to test whether hypothetical processes do or do not take place, and how. Language is not analyzable in the same empirical sorts of ways in laboratories. The raw phonetic data shown in great detail by our electronic analyzers of various types do not define for us our posited phonemes or morphemes or accents, although machines can be programmed – with a wide variety of strategies – to produce recognizable speech. Our

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63. Up to about 1920, scholars listed the differences assumed for 10th-century Slavic and then distributed their development along a time continuum as far back as individual taste required. A series of objections to this methodology, raised by Trubetzkoy and others, made it hard to justify this procedure, for typological and sociolinguistic factors render it thoroughly implausible. One wonders why Kortlandt has chosen to revert to such ill-founded speculation that leads him to date, for instance, his "Late Balto-Slavic" as 1500-1000 B.C. (1982 181). It is far more probable that the continuum of dialects deserving such a name still were spoken in the sixth century A.D.

64. Does "desperately agnostic" imply a search for a Truth which will bring salvation? Can Kortlandt see a "false" assumption as entailing personal disaster? An engineer who builds a faulty bridge will be held responsible if the structure collapses and lives and property are lost. Life and limb are not, however, threatened by a linguist building a conjectural linguistic bridge that is to reach from the fairly solid ground of OCS out over an abyss of generations to the tenuous other shore of hypothetical Indo-European: still, surely, responsible theorists should select only the solidest of evidence as components for such a structure. *Vъsъ* and *lъzě*, for example, are materials of dubious value; prudence dictates that we not assign them key – so to speak weight-bearing – positions in our "bridge". But in the end the structure cannot be tested; the only measure for success is plausibility. And plausibility cannot be estimated outside of a framework of theory.

ability to describe our own languages has so far proved extremely limited, but experimentation on the basis of specific assumptions has provided more and more illumination. I remain skeptical about much speculation concerning such details as the precise phonetics of the declensional forms of the forerunners of OCS vьsь in, say, the 700's, but I find it fascinating to contemplate possible major phonological and morphological subsystems of prehistoric dialects which are hypothesized on the basis of carefully sifted data and analyzed according to overtly stated systematic theories and procedures.[65]

Ted Lightner's total faith in the power of his version of generative linguistics to give decisive answers to all crucial questions often led him to brash dismissal of previous and current opinions, but his flat authoritarian pronouncements about right and wrong were based on an explicit doctrine, so that disagreement on principled grounds was possible. His careful reading of pertinent studies, especially Meillet, and his meticulous attention to detail – always with the total system in view – and almost fanatical insistence on precise formal expression of every analytic step made him a formidable opponent in discussion of general issues and of specific substantial problems. I disagree with much of what he wrote, but I am grateful that he forced me to rethink and deepen my own analyses.

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65. Frederik Kortlandt seems to feel that he has access to *facts* about prehistoric dialects, and he apparently believes that his own authority is so self-evident that he need not give serious attention to interpretations other than his own. His simplistic 1984 essay with its misrepresentation of my hypothesis and my argumentation is merely one example of his cavalier treatment of almost everyone as he slaps down his opinions on one topic or another. Smugly confident in the infallibility of his judgement, he has exempted himself from the discipline of meticulous analysis, from the responsibility of defining terms, of adducing facts, of consistency in procedures, of reasoned argumentation, and especially of working within a specific theoretical framework. Some of his remarks indicate that he is aware of scholarly principles and standards; one hopes that he can recognize that he must himself conform to them if he is to utilize his undoubted industrious energy to produce work more substantial than his articles of 1979 and 1984.

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DERIVED IMPERFECTIVES IN SLAVIC: A STUDY IN DERIVATIONAL MORPHOLOGY

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This article is a historically oriented study of derived imperfectives (DI's) in all the Slavic literary languages. It assumes that DI's were originally formed by the addition of various prefixes across already existing noniterative - iterative aspectual couples and that these lexical derivatives later developed into the familiar perfective - imperfective aspectual opposition. The suffix -ā- is logically accepted as the original and principal DI formant. Later the suffixal complex -ow+ā- began to be used in the forms -ova- and -yva-. The invariably stressed -ā́- shows an early preference for underlying oxytonic stems, while the -ow+ā- complex was used at first for root-stressed stems. Both suffixes were added to the nonpresent stem, the stem consistently used for derivation. Upon this addition verbalizing suffixes of the underlying stems that contribute meaning to the original stem are kept, while those that function only as verbalizing suffixes are truncated. The only exception here is created by -ā-, which, when stressed as an original verbalizing suffix or as a DI formant, is maintained. In two cases a two-stage DI formation is postulated: once, when the DI suffix -ā- is stressed and another -ā- is added and again, when the DI suffix -ā- becomes unstressed and is accordingly dropped and the -ow+ā- complex is employed for the new DI. The original patterns of distribution of these suffixes have been considerably altered with the passage of time.

As Theodore M. Lightner's last absorbing and challenging book, Introduction to English Derivational Morphology, clearly emphasizes, his intellect was almost exclusively committed to this topic in the latter years of his life. He considered derivational morphology (DM) as the single most important and most urgent present-day task for linguistic science, a necessary precursor to the more sophisticated study of syntax. We are pleased to dedicate this historical treatment of an important Slavic problem in DM to Lightner's memory, daring to hope that he might have found its perusal rewarding. The DM problem we propose for study is the all-pervasive derivational process in the Slavic verbal systems that produces so-called derived imperfectives (DI's), for all intents and purposes creating imperfective verb stems that, viewed dynamically, proceed to conjugate and produce both present- and past-tense inflectional forms and a whole gamut of syntactic derivatives such as present active participle, imperative, infinitive, perfect participle, etc., formed from both present and nonpresent stems. We shall first provide a special classification of verbal stems in Slavic designed to lay bare the stem morphology and to emphasize the important distinction between present and nonpresent stems.

Next we shall subject the DI suffixes to exhaustive analysis. We shall address such questions as: Which suffixes are used and why? Why did variants of the original suffixes develop? To which stem (present or nonpresent) was the suffix added? Was the suffix added to the truncated stem or not? What is the relationship between iteratives and DI's? What are the accentological characteristics of DI's? And, finally, we shall indulge in a class-by-class discussion of DI formation, consolidating all the information from all the extant literary languages and indicating which languages deviate from the norm. All this information will be briefly summarized in the conclusion.

DI stems are morphologically defined by the formula Prefix + Basic Stem + DI Suffix. The prefixes are a necessary part of these aspectual derivatives, but they are independent semantic elements, whose presence need only be recognized. The remaining elements of the formula, however, are of paramount importance. The interaction between the basic stems and the DI suffixes is the real subject of this paper, and both elements need careful description. Below we give a classification of an abbreviated list of useful Common Slavic verbal stems together with their pre-Slavic precursors. Note that the main classes of stems, denoted by Roman numerals, are defined first by the presence or absence of a suffix. If a suffix is used, the stems are further defined by its presence or absence in both the present and nonpresent stems(NPS). The present-stem suffix -j- constitutes a special case. Its use is so widespread that in each class we provide two columns of stems: the A column versus the B column. Class IB, IIB, etc., are differentiated from the A classes in that the present stem in the former subclasses always has the suffix -j-. If both stems are suffixed in addition to the B subclasses, the suffix may be the same or different for both stems. Finally, if the suffix is the same for both stems, an additional suffix may appear in the NPS. The present stem is used to form the present tense, the present participles and the imperative. The NPS forms the basis for the infinitive and the whole array of past participles and past tenses. We call attention to the fact that the e/o thematic complex is not considered a suffix here. It is relegated to the status of a fill-vowel inserted between the final consonant of the root or stem and the initial consonant of the personal ending. Thus, ved + e + ti (3sg.), ved + o + nti (3pl.). It will be noted also that some roots appear in two forms. This is a manifestation of quantitative ablaut and is caused by the different placement of stress at one time: mir+e+tí > mьretъ, mer+téj > mrětí; pejs+j+é+ti > pīšétь, pis+a+téj > pьsatí. As a matter of fact, most roots containing a jer in Common Slavic have the original stress located at least three morae from the root syllable: birātéj > bъrātí, milk+ej+e+tí > mьlčitъ, milk+ē+téj > mьlčatí. The present stem will be listed first in the display below.

Common Slavic Verbal Classification

Class I (No suffixation except for the -j- appearing in all "B" subclasses)

IA (-∅-/-∅-)	IB (-j-/-∅-)
*wed > ved- (lead)	*ĝneH₃ > znāj-/znā- (know)
*mer > mьr-/mer- (die)	*kol > kolj-/kol- (stab)

*g~ej (+w) > žīv-/žī- (live)   *kruH > krȳj-/krȳ- (cover)
*leH₁ĝh > lěz- (crawl)   *g~hr+eH₁ʼ> grěj-/grě- (heat)

    IA2 (-∅-/-∅-)
*dō+d/*dō > dād-/dā- (give)
*eH₁d > jěd- (eat)

Class II (Suffixed nonpresent stem)

    IIA (-∅-/-eH₂-)   IIB (-j-/-eH₂-)
*bher > ber-/bьr+ā- (take)   *pejk > pīš-/pьs+ā- (write)
*ĝhaw > zov-/zьv+ā- (call)   *wreH₁g > rěž-/rěz+ā- (cut)
*g~he/on > žen-/gьn+ā- (drive) *stel > stelj-/stьl+ā- (spread)
                                *kaw > kuj-/kov+ā- (forge)
                                *seH₁ > sěj-/sěj+ā- (sow)
                                *teH₂ > tāj-/tāj+ā- (melt)
                                *smej > směj-/smьj+ā- (laugh)

Class III (Suffixed present stem)

    IIIA (-n-/-∅-)
*merHĝ > mьrz+n-/mьrz- (freeze)
*kuHts > kȳs+n-/kȳs- (turn sour)
*steH₂ > stā+n-/stā- (stand up)

Class IV (same suffix in both stems)

    IVA (-ej-/-ej-)   IVB1 (-eH₂+j-/-eH₂-)
*proĝ > pros+ī- (ask)   *dheH₁+l > děl+āj-/dèl+ā- (do)
*wod > vod+ī-(lead)   *(s)kop > kop+āj-/kop+ā (dig)
*muHdsl > mȳsl+ī-(think)   *orbh+ot > rābot+āj-/rābot+ā- (work)
                                *an+j > vonj+āj-/vonj+ā- (smell)

                                         IVB2 (-eH₂+j-/-eH₁-)
                                *aw+m > um+ēj-/um+ē- (know how)
                                *kajl > cěl+ěj-/cěl+ě- (heal)
                                *bhag+eH₂t > bogāt+ěj-/bogāt+ě-
                                (become rich)

Class V (Identical primary suffix in both stems; additional suffix in the
nonpresent stem)

    VA (-n-/-n+ow-)   VB (-ow+j-/-ow+eH₂-)
*wert > vьr(t)+n-/vьr(t)+no-   *woj > voj+uj-/voj+ev+ā- (battle)
(return)
*mej > mi+n-/mi+no- (pass)   *reH₃dh > rād+uj-/rād+ov+ā- (rejoice)
*krejk > krik+n-/krik+no- (cry) *weH₁r > věr+uj-/věr+ov+ā- (believe)

Class VI (Different suffix for each stem)

    VIA1 (-ej-/-eH₁-)
*legh > lež+ī-/lež+ā- (lie)
*melk > mьlč+ī-/mьlč+ā- (be quiet)
*wejHd > vīd+ī-/vīd+ē- (see)

VIA2 (-ej-/-eH₁-)

*sup > sъp+ī-/sъp+ā- (sleep)

In Class IA2, the reader will recognize the inclusion of the athematic verbs, those verbs that do not utilize the fill-vowel e/o in the present tense.   This condition is clearly shown in OCS and is preserved to a greater or lesser extent in the other Slavic languages.   In Class IIB (-j-/-ā-) roots terminating in vowels or the glide j may undergo some changes. NPS's like sěja-, taja- have undoubtedly been built on the present stem sě+j- and ta+j-. The NPS sě- does exist in OCS. The NPS smьja- from the root *smej is regular if one considers the effect of the absolutely final accent on the root vowel. The long root vowel in the present stem is puzzling, however.   It may be due to lengthening caused by the juxtaposition of the suffix -j- to the glide of the root or to the effect of the stress located just after the suffix -j-: smej+é/ó. Without a doubt Class IIIA and Class VA pose more than their share of morphological problems.   The form of the root, the form of the suffix, and the original location of stress all come into serious question.   It is easiest to examine the location of the original stress first. Since -ne/o- is a derivational syllable, we would expect the stress to be placed first on that very syllable: -né/ó-.   And this contention is born out by certain both perfective and imperfective stems in Russian: minú, mineš', etc., and tonú, tóneš', etc., where all persons after the 1sg have the familiar recessive accent.   In the case of imperfective verbs with an intact consonant just before the -n- suffix Russian has generalized this recessive stress throughout the paradigm: sóxnu, sóxnes', sóxnut', but cf.   SCr. sähnē, sàhnuti. Stress on the -ne/o- suffix immediately after the root suggests a consistently long vowel in the root, but most of these verbs have a reduced root vocalism. This feature may extend back into the remote history of Indo-European, however; for Sanscrit exhibits reduced vocalism in this class and Lithuanian verbs with infixed -n- also have this feature. There is some evidence, especially via iteratives in OCS, that some perfective (semelfactive) verbs in -n-/-now- were primary.   They have yielded iteratives in the familiar pattern with lengthened root vowel: kosnǫti sę > kasati sę, dъxnǫti > dyxati, drъznǫti > drъzati. In another case the iterative (this time formed by the suffixal complex -j-/-ā-) seems to be formed directly from the NPS: mi+n+ow > minovati. As we shall see, this use of the NPS is the usual mode of formation for iteratives and DI's. Evidence in OCS suggests that imperfective verbs in -n-/-∅- arose later than the perfective verbs with a similar suffixal complex. Vaillant states (op. cit. pp.253-4) that, for example, in the early texts one finds imperfective verbs like gyblje- but in later texts exclusively gybne-. And this relationship extends to a significant number of imperfective verbs in -n-. Another problem, of course, is presented by the transformation of the nonpresent suffix -now- > -nǫ- before the consonantal suffixes of the various nonpresent categories. This is usually ascribed to the development of secondary nasalization before the dental suffix of the infinitive, paralleled elsewhere in the pair nǫditi/nuditi, but it seems more reasonable to assume that such nasalization has arisen by analogy with various verbal roots terminating in a nasal.   Such verbs like načьnǫ, načьneši had infinitives like načęti. In a verb like sъxnoti the -n- would not be lost because this formation is secondary and the -n- is a semantic

element signifying change of state and necessary to most categories of the verb.

We can now proceed to a discussion of DI suffixes and how they interact in general terms with the basic stem types to yield DI's. We assume that there were three original DI suffixes: -ej-, -ā-, and -ow+ā-. The -ej- suffix was also used for the present stem, but originally it may be that the other two suffixes did not have -ā- in the present stem, using instead the present suffix -j-. Later in both instances the -ā- appears also in the present stems so that -ā+j-/-ā- and -ow+ā+j-/-ow+ā- (in a slightly modified form particularly in East and South Slavic) became the dominant DI formants. Note that all these DI's are formed by the addition of an identical suffix to both present stem and NPS. The -ej-/-ej- suffix lost its productivity centuries ago, and it must be the oldest of the suffixes because it formed iteratives that are paralleled in Baltic, cf. goniti (drive) < žen-/gъna vs. Lith. ganýti < genù, giñti; voditi (lead) < ved- vs. Lith. dial. vadýti < vedù, vèsti; prositi (ask) vs. Lith. prašýti < persù, piřšti (ask in marriage). This suffix forms iteratives and DI's from a limited number of motion verbs, cf. OCS goniti (drive), nositi (carry), vlačiti (drag), voditi (lead), voziti (transport), xoditi (walk) and historically defensible iteratives from a random group of other verbs, cf. OCS broditi (ford), blǫditi (stray), mǫtiti (roil), moliti (pray), prositi (ask), měsiti (mix). These verbs are important and instructive in that the motion verbs consititute the aspectual subclass of determinate/indeterminate verbs in East and West Slavic and also form DI's in those languages. We shall return to this issue later, but this unproductive class of DI's will not be pursued further in our paper. We find some evidence for -j-/-ā- in iterative formation in OCS: dati > dajǫ/dajati (give), skočiti > skačǫ;skakati (jump), jęti > jemljǫ/jimati (take), dvignǫti > dvižǫ/dvidzati (move), črěti > črěpljǫ/črъpati (ladle), trъgnoti > trěžǫ/trъdzati (extract); but the vast majority of iteratives use the form of the suffix -ā+j-/-ā-, cf. mesti > metajǫ/metati (throw), rinǫti > rivajǫ/rivati (push), lizati/ližǫ > lizajǫ/lizati (lick), pitěti > pitajǫ/pitati (feed), cělovati > cělyvajǫ/cělyvati (greet), roditi > raždajǫ/raždati (give birth), běžati > běgajǫ/běgati (run). The suffix -ow+j-/-ow+ā- forms in OCS a few isolated iteratives, especially with primary verbs in -ej-/-ej-: kupiti > kupujǫ/kupovati (buy), zъlobiti > zъlobujǫ/zъlobovati (blame), žaliti > žalujǫ/žalovati (grieve).

Since in the preceding paragraph we seem to have equated morphologically both iteratives and DI's, this is a good point at which to explore briefly their interrelationship. Morphologically DI's look like prefixed iteratives, and it is our claim that in origin this is exactly what they are. That is, we see the perfective/imperfective formation as originating not in the suffixation of a prefixed perfective but in the addition of the prefix across the noniterative/iterative aspectual couple. By this process, we obtain a pair of lexical derivatives with the same semantic content but in a new aspectual relationship to each other. The prefix has defined or determined the aspectual meaning of the unprefixed pair to produce a new aspectual meaning that we conventionally label perfective/imperfective. Hard evidence for this may be seen in Russian where a fair number of one-time noniterative/iterative pairs form lexical derivatives that are perfective/imperfective merely by prefixation: idti/xodit' > projti/proxodit', nesti/nosit' > otnesti/otnosit',

byt'/byvat' > dobyt'/dobyvat', stupit'/stupat' > postupit'/postupat'. With the drastic decline in use of the iteratives in most Slavic languages, it is, of course, no longer possible to exploit this relationship between iteratives and DI's; and synchronically we speak exclusively of suffixation in DI formation.

We continue with our analysis of the suffixes -ā- and -ow+ā- in a series of questions. The first question is: Why have these specific suffixes been used in DI formation? Why have these suffixes been chosen instead of -n-, -ej-, or -ē-? We are certain that the answer lies in the fact that -ā- and -ow+ā- are pure unadulterated verbalizing suffixes, semantically neutral. A moment's reflection will reveal that the other verbalizing suffixes have some semantic complications: -n- and -ē- signify change of state, -ej- produces factitive-causatives. Our second question is: To which stem are the DI suffixes added? This is indeed an interesting question with a number of ramifications into Slavic verbal morphology. The reader has already noted our insistence on the two-stem analysis of Slavic verbs in the classification table -- the present stem and the NPS. And he will see in what follows that DI formation is one of the best arguments for the two-stem approach. In each class it will be shown in the table below that the NPS is the basis for DI formation. We refer only to some of the verbs listed in the original classification table.

Class IA (-∅-/-∅-)
-mьr > -mīr+ā
-žī̄ > -žī̄+w+ā

    Class IA2 (-∅-/-∅-)
-dā > -dā+w+ā
-jěd > -jěd+ā

    Class IIA (-∅-/-ā-)
-bьr > -bīr+ā
-zьv > -zȳv+ā

    Class IIIA (-n-/-∅-)
-mьrz > -mьrz+ā
-kȳs > -kȳs+ā
-stā > -stā+w+ā

    Class IVA (-ej-/-ej-)
-pros > -prās+j+ā/-prās+j+ow+ā
-mȳsl > -mȳsl+j+ā

    Class VA (-n-/-n+ow-)
-to(p) > -tāp+ā

Class IB (-j-/-∅-)
-znā > -znā+w+ā
-krȳ > -krȳ+w+ā

    Class IIB (-j-/-ā-)
-pьs > -pīs+ā/-pīs+ow+ā
-stьl > -stīl+ā
-sě > -sě+w+ā/-sěj+ow+ā

    Class IVB1 (-ā+j-/-ā-)
-děl > -děl+ow+ā
-kop > -kop+ā+w+ā
-rābot > -rābot+ow+ā

    Class IVB2 (-ē+j-/-ē-)
-um+ě > -um+ě+w+ā
-cěl+ě > -cěl+ě+w+ā

    Class VB (-ow+j-/-ow+ā-)
-voj+ev > -voj+ev+ow+ā

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-rī  >  -rī+w+ā
-tъk  >  -tȳk+ā
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     Class VIA1 (-ej-/-ē-)
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-tъrp+č  >  -tъrp+č+w+ā
-vel+č  >  -vel+č+w+ā
-zъr  >  -zīr+ā
-svъt  >  -svīt+ā
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     Class VIA2 (-ej-/-ā-)
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-sъp  >  -sȳp+ā
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     In some classes the choice of the NPS is not so clear as in others.
So, for example, in Class IA, where mer- looks like the NPS of choice, but
it is only a special stem found in the infinitive and the aorist that
competes with the NPS mъr that occurs in all the other nonpresent forms.
This competition emerges in the modern languages, where most West Slavic
languages use -mēr+ā, Slk -mierat', and elsewhere we find the DI stem -
mīr+ā, R -mirát' (in both cases with the typical lengthening of the
syllable immediately preceding the stressed -ā́-). We want to suggest here
that this pretonic length was originally not a morphological feature of DI
formation, but was the result of the attachment of the stressed suffix -ā́-
to the root at a time when pretonic length was a general phonological
condition in Slavic. The stem complex žīv-/žī- looks like a quandary, but
we would select the NPS žī- and obtain žī+w+ā, where the hiatus-breaker -w-
is inserted before the back vowel -ā-. Inspection will reveal that -w-
appears again and again whenever the NPS ends in a vowel. Note that in
Class IVA the -ej- suffix is reduced to -j- before the DI vocalic suffix.
Note also that in Classes IIA, IIB, IVB1, VA, VB and partially in Class VI
that the suffix common to the NPS in these cases has been truncated. This
fact raises another question: Why are some suffixes deleted and others left
intact? And this fact obscures somewhat the problem of which stem
interacts with the DI suffix since in stems with deletion of this suffix it
looks as if the root is used and not the NPS. It will be clearer if we
explain the deletion problem first. As stated above, the suffixes -ej- and
-ě- do not truncate because they are meaningful; the former produces
iteratives and causative-factitives, and the latter yields change-of-state
verbs. We claim that originally there was no -now- suffix in Class IIIA
(i.e., the suffix -n-, indicating change of state, was logically associated
at first only with present tense forms); so there is no problem of deletion
here. In Class VA in the few instances where such verbs produce DI's the -
now- suffix is a specific perfectivizing suffix and is incompatible with
imperfective verbs and must be dropped. The situation with regard to -ā-
is much more complex. While one would expect -ā- to be deleted because it
bears no particular meaning, its presence or absence seems to depend on
stress. If the stress is on the -ā-, it is preserved; and the DI suffix -
ā- is added to the original -ā- to yield -ā+ā- > -ā+w+ā- > -ava-. If the
stress is not on the -ā- because the original stress was barytonic or
because the stress was retracted from the -ā- to a long vowel in the root,
the -ā- is lost. We have ample evidence in South Slavic for this kind of
recessive stress: Class IIB: Bg -písá, SC -písati, Sn -písáti; Class IVB1:
Bg -pítá, SC -pítati, Sn -pítati. Since we cannot record this specific
retraction in East Slavic, the recessive stress in the DI's with -yva-/-

uva- must have been triggered by barytonic stems like Class IIB: R -mázat',
BR -mázac', Ukr -mázaty; Class IVB1: R -plákat', BR -plákac', Ukr -plákaty.
Then it must have spread to nonbarytonic stems. In Class IIB at least this
development might have been furthered by the well-known recessive stress in
the present forms. This lost -ā- cannot be replaced by another -ā-; so
some form of the alternate DI suffix, -ow+ā-, is used. The stress that
developed on the root vowel may or may not remain there. Root stress with
the suffix -(y)va- is universal in East Slavic and Bulgarian. Suffixal
stress with the suffix -yva- in SC and -ova- in Sn is the rule. It is
interesting to note that Slavic languages like Pol, Cz, Slk, US, LS, and
Mac with a generalized recessive stress throughout the language
consistently lose the -ā- and employ the suffixes -ova-, -yva-, -uva-. In
the three West Slavic languages there are, however, some significant
counter examples in Class IVB1. In Old Polish and in Modern Czech and
Modern Slovak we have the following DI's: -pytawać, -czekawać; -dělávat
(the Czech verb -ptávat proceeds from pьtati and is not a proper example of
a verb stem with a long root vowel), -čekávat; -pytávat', -čakávat', where
the original -ā- was preserved and was augmented by the addition of another
-ā-, the DI formant. In Slovak the -ava- suffix in -pytávat' is merely the
result of some confusion; elsewhere there is good evidence that stems with
long root vowels use -ova-, but stems with short root vowels use -ava-:
-čítat' > -čitovat', -hádzat' > -hadzovat'; -volat' > -volávat', -hovat' >
-hovávat'. The consistent use of -ava- in Czech may be viewed as an
attempt to maintain a traditionally long vowel in the one-time pretonic
position. Note that -ova- would not permit this condition. In Polish the
suffix -ywa- with an original pretonic long -ȳ- could easily substitute for
the -awa-. We know that in Old Polish the -awać shifted to -ywać in the
16th century. We illustrate the effect of stress in Classes IIB and IVB1,
where the NPS is characterized by -ā-. Class IIB (mázati): R -mázyvat', BR
-mázvac', Ukr -mázuvaty, Bg -mázvam, SC -mazívati, Sn -mazováti; (pьsatí):
R -písyvat', BR -písvac', Ukr -písuvaty, Bg -písvam, SC -pisívati, Sn
-pisováti/-pisávati; (oratí): BR -vórvac', Ukr -órjuvaty, Bg -órvam, SC
-orávati, Sn -orávati. The use of -ova-/-yva- in the case of pьsatí can be
explained as follows. OCS shows DI formation by means of -ā- and root
lengthening: sь=pьsatí > sь=pīsáti. We conclude that the stress in the DI
was retracted to the long root syllable. Then later the more distinctive
ending -yva-/-ova- was added with loss of the original -ā- DI suffix.
Class IVB1 (plákati): R -plákivat', BR -plákvac', Ukr -plákuvaty, Bg
-plákvam, SC -plakívati, Sn -plakováti; (pitáti): R -pítyvat', BR -pítvac,
Ukr -pítuvaty, Bg -pítvam, SC -pitívati, Sn -pitováti/-pitávati; (kopáti):
R -kápyvat', BR -kópvac, Ukr -kópuvaty, Bg -kopávam, SC -kopávati, Sn
-kopávati. Again in the case of pitáti we assume a retraction to the long
root syllable so that the secondary barytonic stem could then trigger the
use of -ova/-yva- with loss of the original -ā- suffix. It seems very
possible that the DI's in East Slavic and Bg derived their root stress from
the original barytonic or recessive stress, while in SC and Sn the stress
was generalized on the -ā- of the -ova-/-yva- possibilities. It is not
absolutely clear why some languages chose -yva-, and others -ova-.
Undoubtedly -yva- developed from -ova- either because it was chosen as a
more distinctive DI suffix, or because it was formed in accordance with the
most prominent feature of DI's -- lengthening of the immediately pretonic
syllable. At the time when this might have been effected, the ablaut
alternations o/ā and ь/ū/ȳ were very much alive so that the -ūje-/-ovā-
complex gave rise to -ūje-/-ȳvā-. This would have occurred, of course, in

cases where the DI's did not have root stress. As the reader can see, even from the few examples cited above, one of the DI suffixes has usually proliferated at the expense of the others. This is especially true in East Slavic, where -yva- has captured the field. In South Slavic Bg has preserved the distinction engendered by stress differences very well, while SC and Sn have greatly confused the issue. Repercussions of this relationship between root stress in the underlying verb and the use of some form of -ova- as opposed to -ā- in DI formation may be detected in the use of -yva- as DI formant with barytonic verbs in Class IA1 in both R and Bg, cf. R -kládyvat', -krádyvat', Bg -grízvam, -krádvam, -ljázvam. The reality of the retraction of stress to a long vowel is emphasized in a variety of iteratives preserved in various Slavic languages: R voróčat', SC vràćati, R klánjat'sja, SC klànjati se. In SC in Class IA1 this root stress in iteratives has created present tense forms in -j- (always characterized by recessive stress), and then these iteratives have spread to the corresponding DI's: dìzati, dìžēm > ˋ-dizati, ˋ-dīžēm; stìzati, stìžēm > ˋ-stizati, ˋ-stīžēm; nìcati, nìčēm > ˋ-nicati, ˋ-nīčēm. We shall return to this discussion about the confrontation of -a- and -ova-/-yva- in the section on the individual classes. Now that we have established a reasonable basis for deletion of the primary suffix, we can claim that in all cases the NPS is used for DI production. And why then is the NPS used for DI formation? A little reflection should convince us that the NPS is the principal derivational stem forming all kinds of syntactic derivatives: infinitive, perfect participle, past active participle, past passive participle, verbal nouns, aorist, and most imperfect forms. The present stem produces only closely related and dependent syntactic derivatives like the present active participle, present passive participle, and the imperative.

Class IA1: We have already seen that the normal DI suffix here is -ā+j-/-ā́-. We repeat that the stress on the -ā́- formant among these predominately oxytonic verbs frequently lengthens the pretonic syllable, especially in the case of short i or u. Thus we have R -mirát', BR -mirác', Ukr -miráty, Bg -míram, Mac -mira, SC ˋ-mirati, Sn -mírati, Pol -mieraċ (Old Pol -miraċ). This process brought about lengthening of the -mer- form of the root in most West Slavic languages: Cz -mírat (OCz -mierati), Slk -mierat', US -měrać, LS -měraś. This long -ī- in the root syllable ranged beyond roots containing jers to roots with -e-, especially to those terminating in a velar, possibly via such forms as OCS imperative rьci and prompted by such roots already containing an -ī-: dīg, nīk, stīg, strīg. This phenomenon is frequent in SC, sporadic elsewhere in South Slavic. Note SC ˋ-picati, ˋ-ricati, ˋ-stizati, ˋ-plitati with dental palatalization of the velars. Such DI's are also accompanied by the present suffix -j- without the DI indicator -ā- and by root stress in the NPS : SC prèpicati < prepícati and 2sg pres. prèpīčēš < prepīk+j+é+ši. Loss of the final jers precipitated the analogical retraction to the root syllable in the present form. Stress on the root in the nonpresent forms agrees with the stress in the present because the normal forms would have had the stress on the same syllable -pīcáti, -pīcáješ. The same use of -j-/-ā- for DI's is prevalent among stems ending in -r: pròstirati, pròstīrēm. And in Bg the -j- shows up before the -ā- in some stems ending in -d: -bodá > -báždam, -kladá > -kláždam, -vedá > -véždam. The recessive root stress is the rule for this class in Bg. A very few stems here (chiefly barytonic stems) use the modified ow+ā suffix: R -krádyvat', -kládyvat', Bg -grízvam,

-grébvam. Stems terminating in -j- preceded by a front vowel in most West
and South Slavic languages change the original hiatus-breaker w > j: Pol
-bijać, Cz -bíjet, Slk -bíjat', LS -bijaś, Sn -bíjati, SC -bíjati, but US
-biwać, Bg. -bívam.

Class IA2: The only two verbs here with any currency jĕd- and dā- are
not uniform throughout Slavic. For the most part, jĕd uses ā+j/-ā-: R
-jedát', BR -jadác', Ukr -jidáty, Pol -jadać, Cz -jídat, Slk -jedat', SC
-jédati, Sn -jédati, Bg -jáždam (with irregular palatalization of the /d/),
Mac -jaduva. Both Sorbian languages, however, use -ow+ā-: US -jĕdować, LS
-jĕdowaś. The stem dā, as a stem ending in a vowel, mostly used -j-/-ā-: R
-davát'/-dajú, BR -davác'/-dajú, Ukr -daváty/-dajú, Pol -dawać/-daję, SC
-dávati/-dájēm. The other West Slavic languages and Bulgarian have
generalized -ā+j-/-ā-: Cz -dávat/-dávám, Slk -dávat'/-dávam, US
-dawać/-dawam, LS -dawaś/-dawam, Bg -dávam, Mac -dava, while Slovene has
generalized the -j- of the present stem: -dājati/-dājem.

Class IB: The monosyllabic NPS's terminating in vowels all behave
regularly here, adding the expected formant -ā- preceded by the -w- hiatus-
breaker: R. -myvát', BR -myvác', Ukr -myváty, Bg -mívam, Mac -miva, SC
-mívati, Sn -mívati, Cz -mývat, Slk -mývat', US -mywać, LS -mywaś. The
only stems ending in consonants that have subsisted throughout Slavic are
those in the liquids -r, -l. Because of the tautosyllabic treatment of
such liquid diphthongs before consonants in most nonpresent forms, the DI
formation has not been uniform. We illustrate this situation with mel-
(grind) and kol-(stab). The expected root with lengthening of the root
vowel shows up in Cz -mílat, LS -mĕlaś, Bg -kálam, Slk -káľat', US -kałać;
and lengthening plus the fairly frequent confusion between e and i in DI
formation in Bg -mílam, Sn -mílati, Pol -mielać. In two cases the DI suffix
-ow+ā- appears with the root as alternatives: Bg -kólvam, US -kałować, and
in Mac the formula root + -ow+ā- yields both verbs: -koluva, -meluva. In
East Slavic, the root is used but the disyllabic NPS arising from the
liquid diphthongs has prompted use of the modified -ow+ā- > -yva-: R
-kályvat', BR -kólvac', Ukr -kóljuvaty. In the remaining cases the NPS
produced by metathesis is utilized: Cz -klávat, Slk. -mlievat', Pol.
-kłuwać. SC forms no DI's from these consonantal stems. East Slavic used
the truncated form of the stem, which may be analogically lengthened: R
-mályvat', BR -mólvac', Ukr -móljuvaty.

Class IIA: The stems here feature an NPS consisting of root+-ā-. This
-ā- is declared to be an old preterite ending, and as such it is not an
integral part of the stem. It is not surprising, therefore, that
originally it did not attract the stress and does not appear in DI
formation. As usual, however, the nonpresent form of the root,
appropriately lengthened except in West Slavic, appears in the DI's. For
illustration we present the verb ber/bьr+ā (take) and the somewhat
irregular verb gen/gьn+a(drive): R -birát', BR -birác', Ukr -byráty, Pol
-bierać, Cz -bírat, Slk -bierat', US -bĕrać, LS -bĕraś, Bg -bíram, Mac
-bira, Sn -bírati. SC -bírati in the present tense ᵇbīrám/ᵇbīrēm reveals
also in this class use of the alternative DI suffix complex -j-/-ā-. The
verb gen/gьn+a is anomalous because it makes extensive use of the old
iterative goniti. This iterative is usually suffixed to form the DI, and
sometimes appears itself in the corresponding perfective: R -gnát',
-gonjú/-gonját', BR -hnác', -hanjú/-hanjác', Ukr -hnáty, -ženú/-hanjáty,

Pol -gnać, -gonię/-ganiać, Cz -hnat, -ženu/-hánĕt, Slk -hnat', -ženu/-haňat', US -hnać, -hnaju/-hanjeć, LS -gnaś, -ženu/-ganjaś,-ganjowaś, Bg -gónja/-gónvam, Mac -goni/-gonuva, SC ˈgnati, ˈgnām/-gòniti, Sn -gnáti, -ženem/-gånjati. Note that Bg and Mac use the modified -ow+ā- exclusively and that the Sorbian languages have it as an alternate.

Class IIB: There is evidence in OCS that the original DI suffix here was -ā-: zakazatí, zakažǫ/zakazáti, zakazájǫ. If, as we have suggested, the stress in the DI form retracted to the long root syllable, some form of -ova- appeared as the new DI indicator: (vęzati); R -vjázyvat', BR -vjázvac', Ukr -vjázuvaty, Pol -wiązywać, Cz -vazovat, Slk -vazovat', US -wjazować, LS -wizowaś, Bg -vézvam, Mac -vezuva, SC -vezívati, Sn -vezováti. In the East Slavic languages there is some evidence that barytonic stems maintained the DI suffix -ā- as an alternate just because of the clear difference in stress: R -rézat'/-rezát', -rézyvat', BR -rézac'/-rezác', -rézvac', Ukr -rízaty/ -rizáty, -rízuvaty. The -ā- is the sole suffix in the case of stems with a short i/u + liquid in the root, e.g., stel+j/stĭl+ā (spread): R -stilát', BR -scilác', Ukr -styláty, Pol -ścielać, Cz -stýlat, Slk -stielat', US -sćelać, LS -sćelaś, Bg -stílam, Mac -stila, Sn -stíljati. SC does not utilize this verb. A somewhat deviant set of forms is presented by kow+j-/kow+ā, a root ending in a back glide. The East Slavic languages add a modified -ow+ā- to the NPS: R -kóvyvat', BR -kówvac', Ukr -kóvuvaty. A few languages affix -ā- to the end-stressed NPS: Bg -kovávam, Mac -kovuva, Cz -kovávat, US (not found), LS (not found). The rest add -ā- to the root either without change or by lengthening the -ov of the root > -av- or -yv-: Pol -kuwać, Slk -kúvat', SC -kívati, Sn -kāvati. A similar confusion results from a root that seems to end in the front glide -j-: smej-/smьj+ā (laugh). In this verb the -j- in both present stem and NPS causes some disruption. Again the East Slavic languages use -yva-; R and BR add this suffix to the present stem; -sméjivat', -sméjvac'; Ukr to the NPS: -smýjuvaty. The present stem is also utilized in this way by a Bg alternate -sméjvam, as well as by the Mac -smejuva. SC adds -ā- to the NPS with present-stem vocalism: -smejávàti. The remaining languages add -ā- to a form of the stem minus the -j-. Some utilize the NPS, smī+ā: Bg -smívam, Pol -śmiwać; others employ the present stem, smě+ā: Sn -smévati, Cz -smívat, Slk -smievat', US -smĕwać, LS -smĕwaś. Barytonic vocalic stems where the -ja is secondary (sějati) are quite consistent in adding -ā- to the root: R -sevát', BR -sjavác', Ukr -siváty, Bg -sjávam, Mac -seva, Sn -sévati, Pol -siewać, Cz -sévat, Slk -sievat', US -sywać, LS -sewaś. The East Slavic languages and Bg use the barytonic NPS + yva as alternates: R -séjivat', BR -séjvac', Ukr -síjuvaty, Bg -séjvam. SC irregularly adds -ā- to the NPS: -sejávati.

Class IIIA: As stated before, we are making the assumption that originally the -n- was confined to the present forms because of the meaning attached to this element: change of state. Since the NPS has no -n-, the regular pattern is to add -ā- to the root: R -merzát', BR -mjarzác', Ukr -merzáty, Pol -marzać, Cz -mrzat. A number of languages, however, employ the highly productive suffix -ow+ā- or its modified forms: Bg -mrězvam, Mac -mrznuva, SC -mrzávati, Sn -mrzováti, LS -marzowaś, US (not found). Underlying perfective verbs here happen to have vocalic roots which consistently add -ā-, but the DI complex -j-/-ā- may be strong in this type: R -stavát', -stajú, BR -stavác', -stajú, Ukr -staváty, -stajú, Pol -stawać, staję, SC ˈstajati, ˈstajěm, Sn -stājati, -stājem, but Bg -stávam,

Mac -<u>stanuva</u>, Sn -<u>stávati</u>, Cz -<u>stávat</u>, Slk -<u>stávat</u>', US -<u>stawać</u>, LS -<u>stawaś</u>. Note that Mac regularly preserves the -n- in DI's from both imperfective and perfective verbs.

Class IVA: DI development in this category seems to be complicated by the fact that this class embraces a number of derivational types: iteratives, causatives, and factitives formed from both nouns and adjectives. As previously mentioned, this meaningful suffix is not lost and the reduced form -j- of the class suffix -ej- appears before the vocalic DI suffix. Here too the original DI formant must have been -ā-. Since the -ej > -j+ā- complex did not add another syllable, we end up essentially with disyllabic stems in -ā-, which then added either -ova- or -ā- in accordance with their stress just as occurred in Class IVB1. And it is true that except for a fair number of original DI's in -ā-, the types and distribution of DI's in IVA are very similar to those in IVB1. Most languages, therefore, have a complex mixture of DI's with a minority of stems in -ā- versus a majority in -ova- or -ava-, -yva-. DI's in -ā- have a tendency to maintain themselves in several categories of underlying stems: Underlying nonprefixed aspectual couples: R -<u>pustít</u>'/ -<u>puskát</u>', BR -<u>puscíc</u>'/-<u>puskác</u>', Ukr -<u>pustýty</u>/-<u>puskáty</u>, Bg -<u>pustjá</u>/-<u>pustjávam</u>, Mac -<u>pusti</u>/-<u>pusta</u>, SC -<u>pùstiti</u>/-<u>púštati</u>, Sn -<u>pustíti</u>/-<u>púščati</u>, Cz -<u>pustit</u>/-<u>pouštět</u>, Slk -<u>pustit</u>'/-<u>púšt'at</u>', US -<u>pušćić</u>/-<u>pušćeć</u>, -<u>pušćować</u>, LS -<u>pušćiś</u>/-<u>pušćaś</u>, -<u>pušćowaś</u>. Causatives: R -<u>bávit</u>'/-<u>bavlját</u>', BR -<u>bávic</u>'/-<u>bavljác</u>', Ukr -<u>bávyty</u>/-<u>bavljáty</u>, Bg -<u>bávja</u>/-<u>bávjam</u>, SC -<u>bàviti</u>/-<u>bávljati</u>, Sn -<u>báviti</u>/-<u>bávljati</u>, Slk -<u>bavit</u>'/-<u>bávat</u>', US -<u>bawić</u>/-<u>bawjeć</u>, LS (not found), but Cz -<u>bavit</u>/-<u>bavovat</u> and Mac -<u>bavi</u>/-<u>bavuva</u>. Adjectival factitives: R -<u>pólnit</u>'/-<u>polnját</u>', BR -<u>pównic</u>'/-<u>pownjác</u>', Ukr -<u>póvnyty</u>/-<u>povnjáty</u>, Bg -<u>pълnja</u>/-<u>pълnjam</u>, pълvam, Mac -<u>polni</u>/-<u>polnuva</u>, SC -<u>puniti</u>/-<u>púnjati</u>, Slk -<u>plnit</u>'/-<u>pĺňat</u>', LS -<u>połniś</u>/-<u>połnjaś</u>, US -<u>pjelnić</u>/-<u>pjelnjeć</u>, but Sn -<u>pólniti</u>/-<u>polnjeváti</u>, Cz -<u>plnit</u>/-<u>plnovat</u>. Other stem types have a detectable tendency to use some form of -ova- for stems with root stress or recessive stress and -ā- for oxytonic stems. Only in Bg is there a strict relationship between the stress of the primary DI in -ā- and the more complex secondary DI. The East Slavic languages employ exclusively -yva- for such secondary DI's. SC uses -yva- and -ā-, Sn -ova- and -ā-, but their distribution has become much confused over the centuries. West Slavic and Macedonian have only some form of -ova-, but Polish uses the single -ā- formant practically exclusively for this whole class. Note the following accentologically classed stems. (<u>pěniti</u> - barytonic): R -<u>pénivat</u>', BR -<u>pén'vac</u>', Ukr -<u>pínjuvaty</u>, Bg -<u>pénvam</u>, SC -<u>penjívati</u>, Sn (not found), Cz -<u>pěnovat</u>, Slk (not attested), Pol -<u>pieniać</u>; (<u>nositi</u> - recessive): R -<u>nášivat</u>', BR -<u>nósvac</u>', Ukr -<u>nósuvaty</u>, Bg -<u>nósvam</u>, SC -<u>nášati</u>, Cz -<u>nášet</u>, Slk -<u>nášat</u>', US -<u>nosować</u>, LS -<u>nosowaś</u>; (<u>moriti</u> - oxytonic): R -<u>márivat</u>', BR -<u>mórvac</u>', Ukr -<u>mórjuvaty</u>, Bg -<u>morjávam</u>, SC -<u>márati</u>, Sn -<u>morjeváti</u>, Cz -<u>moŕovat</u>, Slk -<u>márat</u>', Pol -<u>marzać</u>.

Class IVB1: We have already explained the distribution of the DI suffixes -ā- and -ova-/-yva- in this class and their dependence on the stress of the underlying stem. We append here two more examples, one with original stress on the -ā- because the pretonic syllable was short, the other where the stress could have retracted to the root: (<u>igráti</u>): R -<u>ígryvat</u>', BR -<u>ýhryvac</u>', Ukr -<u>íhryvaty</u>, Bg -<u>igrája</u> > -<u>igrávam</u>, Mac -<u>igruva</u>, SC -<u>igrati</u> > -<u>igrávati</u>, Sn -<u>ígrati</u> (-<u>igrãm</u>) > -<u>igrávati</u>, Pol -<u>grać</u> >

-grywać (this DI is analogical), Cz -hrat > -hrávat (all verbs of this class, however, use -ávat), Slk -hrat' > -hrávat', US -hrać > -hrawać, LS -grawaś; (čītáti): R čítyvat', BR -čítvac', Ukr -čýtuvaty, Mac -čituva, SC -čitávati, Sn -čitávati, Pol -czytywać, Cz -čitávat, Slk -čitovat', US -čitować, LS (not found).

Class IVB2: This class has a straightforward scheme of production. The verbalizing suffix has meaning and is maintained. To this element is added the expected DI suffix -ā-, and we obtain -ē+ā->-evá-. Note the following example: (spěti): R -spevát', BR -spjavác', Ukr -spiváty, Pol -śpiewać, Cz -spívat, Slk -spievat', US -spěwać, LS (not found), Bg -spívam, SC -spévati, Sn -spévati, Mac -speva. There are no exceptions in this class.

Class VA: The stems here are all perfective and themselves are derived by suffixation of the complex -n-/-now- to underlying imperfective stems. It can easily be shown that when a prefixed verb in -nu- is paired with a DI stem, the DI stem has been derived not from the -nu- verb, but from the underlying imperfective stem: R -vízgnut'/-vízgivat', where -vízgivat' is derived from the basic stem vizžát'. There are, nevertheless, some cases in South Slavic where DI's have obviously been derived from the perfective stems in -nu- because of the retention of -n- in the corresponding DI. In Sn such DI's may proceed from stems containing an /r/ or a vowel just before the -n- suffix: -trníti/-trínjati, -gíniti/-gínjati, -ginjeváti. The suffix -a- predominates in this DI formation. Note the unexpected softening of the -n- in these forms. In SC such DI's may be formed even when a consonant directly precedes the -n-: -mínuti/-minjávati, -bréknuti/-breknjávati, -breknjívati. Here both -ava- and -yva- compete. In Mac, retention of the -n- is practically the rule with the ubiquitous -uva-: -legne/-legnuva, -grne/-grnuva, -mogne/-maga, -mognuva.

Class VB: Since borrowed verbal concepts in their original morphological form usually acquire this verbalizing suffix in Slavic and adopt a biaspectual status, there is no need to form DI's. In time, however, some of these lexical stems demand prefixes and in turn DI's. So far, this has occurred only in East and West Slavic. These verbs produce no DI's in South Slavic. The East Slavic languages and Polish add -yva- to the truncated NPS. In East Slavic the stress is analogically located on the syllable directly preceding the -yva-: (imenováti): R -imenóvyvat', BR -jmjanówvac', Ukr -jmenóvuvaty, Pol -mianowywać. In Czech the suffix -ā- is added to the intact NPS. As we have seen, this is the usual result when the syllable preceding the -ā- is short; -jmenovávat. In Slovak, where such DI's are extremely rare, the suffix -ā- is added to the truncated NPS and the preceding vowel -o- is lengthened on the pattern of the present stem: -budovat'/-budúvat'. This development is obviously motivated by verbs such as -kovat'/-kúvat'.

Class VIA1: Class VI is the only class exhibiting two different verbalizing suffixes, a fact that seems to cause some hesitation in selection of a DI formant. These stems all represent stative verbs; therefore we would expect the -ē- or -ā- (after alveolopalatals) of the NPS to remain and the DI suffix to be employed with it. This is exactly what we find predominating in Bg, SC, Sn, Cz and Slk. We find, however, -yva- well entrenched in East Slavic and Polish, and -ova- in Macedonian and

Upper Sorbian. The suffix -yva- enjoys modest currency also in SC. The suffix -ā- added to the NPS appears occasionally in Russian: -<u>bolevát</u>', -<u>zrevát</u>', -<u>terpevát</u>'. The suffix -ā- with loss of the NPS suffix occurs rarely in most areas. The following selection of verbs should illustrate the problems inherent in this class: (<u>gorěti</u>): R -<u>gorát</u>', BR -<u>harác</u>', Ukr -<u>horjáty</u>, -<u>horáty</u>, Bg -<u>gárjam</u>, -<u>gorjávam</u>, SC -<u>gorévati</u>, Cz -<u>hořívat</u>, Slk -<u>hárat</u>, US -<u>horjować</u>, LS -<u>gorjowaś</u>, Pol (not attested), (<u>dьržati</u>): R -<u>dérživat</u>', BR (not attested), Ukr -<u>déržuvaty</u>, Bg -<u>dьržam</u>, SC -<u>držávati</u>, Sn -<u>držávati</u>, Pol (not attested), Cz -<u>držovat</u>, Slk -<u>držiavat</u>', US -<u>dzerzować</u>, LS -<u>zarzowaś</u>; (<u>sěděti</u>): R -<u>síživat</u>', BR -<u>sédzvac</u>', Ukr -<u>sýdzuvaty</u>, Bg -<u>sedjávam</u>, SC -<u>sedávati</u>, Sn -<u>sedévati</u>, Cz -<u>sedívat</u>, Slk -<u>sedávat</u>', Pol -<u>siadywać</u>, US (not found), LS (not found); (<u>bojati sę</u>): R -<u>bájivat'sja</u>, BR -<u>bójvacca</u>, Ukr -<u>bójuvatysja</u>, Bg -<u>bojávam</u> <u>se</u>, SC -<u>bojávati</u> <u>se</u>, Sn -<u>bojávati</u> <u>se</u>, Cz -<u>bávat</u> <u>se</u>, Slk (not attested).

Class VIA2: The only verb in this subclass also has two different verbalizing suffixes and again we see a variety of DI formations. We expect the NPS formant to subsist and to add the DI formant -ā- to yield -ā+ā-, and this is observed in a number of languages. Bg and Mac, which lose the NPS through loss of the infinitive, add -ā- to the present stem. In East Slavic, the stem is treated analogically as if it were a -∅-/-ā- stem so that -ā- is added to the lengthened root, while in Polish the lengthened form of the present stem is used: R -<u>sypát</u>', BR -<u>sypác</u>', Ukr -<u>sypáty</u>, Bg -<u>spívam</u>, Mac -<u>spiva</u>, SC -<u>spávati</u>, Sn -<u>spávati</u>, Cz -<u>spávat</u>, Slk -<u>spávat</u>', Pol -<u>sypiać</u>, US (not found), LS (not found).

CONCLUSION

In this paper, we have assumed an intimate linkage between nonprefixed iteratives and prefixed iteratives (DI's). The perfective/imperfective pairs were originally formed as lexical derivatives by prefixation of noniterative/iterative couples. We have shown that the DI suffixes are as a rule added to nonpresent stems, which may be suffixless roots. We have accepted -ā- as the original DI formant, joined at a later date by the suffixal complex -ow+ā-/-yw+ā-. Not only was the latter suffix more distinctive as a DI formant; but it was not necessarily stressed as the -ā- formant was and, therefore, was originally employed with root-stressed stems. These root-stressed stems in most cases lost their verbalizing suffixes upon the addition of the -ova-/-yva- complex, and the disyllabic form of the suffix insured that the DI stem would contain one more syllable than the corresponding perfective stem, the usual pattern for perfective/imperfective pairs. The distribution of the DI suffixes and the accentological characteristics of the DI's themselves can now be summarized. The suffix -ā- is added 1) to a root (Classes IA1, IA2, IB, IIIA) and 2) to a stressed and/or meaningful verbalizing suffix (Classes IVA, IVB1, IVB2, VB, VIAa). An unstressed or semantically neutral verbalizing suffix (this refers only to -ā-) is deleted. If this -ā- belongs only to the NPS, the suffix -ā- is added (Classes IIA, IIB). If the -ā- belongs to both stems, the -ova-/-yva- complex (Class IVB1) is utilized. We postulate secondary or double DI formation under two conditions. First, in the case of -ej+ā- > -jā-, where the syllable count remains the same, another -ā- may be added (Class IVA); and this second -ā- has the stress. Second, in the case of barytonic roots or lengthened roots that attracted the stress from the DI suffix -ā- or in the case of

languages developing a generalized recessive stress, this DI suffix is deleted and the -ova-/-yva- complex is added (Classes IIB and IVA) with root stress in most languages. In Class IIB the retraction in the original DI must have been facilitated by the recessive stress peculiar to the present forms. We hope that we have clarified and given new significance to the history of DI formation in the Slavic languages.

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SENTENCE TOPIC IN TEXTS*

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Linguists have often tried to identify the parts of a sentence that are important in conveying information. In a tradition due originally to the Prague School, one nounphrase is identified as the topic of a sentence. The topic NP is salient and organizes the way a sentence is understood: the sentence is taken to be about the referent of the topic.

The topic of a sentence is considered to be a phenomenon of texts and discourse.[1] It is plausible that sentence topics play a role in text structure: a natural hypothesis would be that topics introduce and sustain referents that are matters of concern at the local text level. BUt discussions of topic in languages like English have tended to concentrate on individual sentences, so that this idea has not been systematically investigated.[2] In this paper I discuss a study of the role of sentence topics in English text fragments.

Texts are organized globally, I take it, by pragmatic and genre knowledge. The global structure of a text is abstract. It cannot be found "in" the text in any simple way, since what a text is about need not relate directly to a particular sentence or constituent of the text.[3] This means that global aboutness is not directly related to the sentences of a text. The phenomenon of aboutness has been demonstrated quite convincingly for individual sentences, but little is known about local aboutness in texts.[4]

This paper concerns local text structure. The question addressed is whether sentences in text segments are organized according to sentence topics. In the study reported here this question is asked for constructed text fragments, which allow controlled variation. The idea that sentence topics organize local structure is attractive: it is a specific suggestion about the contribution of individual sentences to text structure, an area that is still quite opaque.

The notion of topic NP generally corresponds quite well to "theme" for the Prague School: the theme of a sentence, usually its subject, indicates what the sentence is about (Firbas 1964, Danes 1974). This characterization holds for English and other subject languages; but not for topic languages. Li & Thompson 1976 distinguishes between languages according to whether subjects or grammaticized topics predominante in the syntactic structures of the language.[5] In topic languages such as Japanese, sentences typically have a grammaticized topic that is syntactically identifiable; the referent of the topic is the center of attention and the center of aboutness for the sentence. This discussion pertains only to subject languages.

I begin with a discussion of sentence topic in single sentences, essentially presenting standard approaches. In Section 2 I extend the approaches to sentences in text fragments, with results that are inconclusive at best. Section 3 considers more closely the relation of sentence topic to sentence aboutness.

1. The notion of sentence topic

In the Prague School approach there are two parts to a sentence, the theme, or topic, and the rheme, the rest of the sentence.[6] The theme is a salient NP referring to "that which is known or at least obvious in the given situation, and from which the speaker proceeds in the discourse; the rheme is that which the speaker states about, or in regard to, the theme of an utterance"--Mathesius, quoted in Firbas 1964. Thus the topic sets the theme, and the rest of the sentence is the comment. This discussion is limited to NP topics; there may be other types as well (See Reinhart 1982, Keenan & Schiefflin 1976).

The way one understands a sentence is structured by the topic: a sentence says something "about" the topic referent, increasing knowledge of it. In other words a sentence is understood to predicate something of the topic referent. As Reinhart 1982 puts it, aboutness is a relation between the referent of the sentence topic and the proposition expressed by the sentences. In this view the topic organizes the information structure of a sentence, a point to which we return below.

The position of the topic NP is salient: topics are perceptually and syntactically important. The topic of a sentence is its surface structure subject, a position of importance syntactically. And subjects apprear canonically at the beginning of a sentence (in the languages considered in the Prague School writings), a position that is perceptually salient. Thus three aspects of sentence structure converge on one constituent in the topic NP, linguistic surface structure, rhetorical structure, and information structure. The topic in a subject language does not receive heavy or contrastive stress and hence is not the center of attention of the sentence.[7] Certain marked structures are exceptional (Gundel 1977, Reinhart 1982, Davison 1984). Marked structures may have no topic, e.g. existential There sentences, or a grammaticized topic in non-subject position, e.g. Left Dislocation. Grammaticized topics such as those of Left Dislocation tend to have the properties of topics in topic languages (cf the discussion of French topics in Lambrecht 1981).

The type and status of topic referents has been much discussed. Taking the view that topics in English involve aboutness, recent work shows that sentence topics may refer to definite or indefinite entities, or to other individual concepts. Carlson 1985, for instance, cites sentences with subjects such as "No one" and "Anyone who murdered X" as examples. Topic NPs may refer to familiar entities or concepts, but the referents may also be new and/or unknown (Prince 1979, 1980). However the referents of topic NPs are most frequently both familiar and definite (Chafe 1976). Linguistic and extra-linguistic context makes the referent to a topic NP more or less familiar and relevant (Gundel 1985), of course. I will not discuss definiteness or familiarity here.

There is another sense in which context is important for sentence topics. The topic of a sentence is sometimes said to vary according to context (Kuno 1972, 1976; Reinhart 1982). This introduces a second notion of topic. In the variable approach a given sentence may have a different topic in different contexts. In certain contexts the topic of a sentence is not its surface subject, but a NP coreferentail with a NP in another sentence. The variable approach to topic is quite different from the canonical approach presented above, although the two are often presented together.

1.2 Examples and tests: canonical topics

I begin with some simple examples. In these sentences the surface
subject is the topic.

    1a Barbara lives in Seattle
    b   Mary bought a bicycle
    c   The rabbit is hiding in Alice's garden
    d   The party will be given by the department
    e   Joan is hard to beat at chess
    f   Beth brought out her queen to frighten William

It seems correct to say that these sentences are "about" Barbara, the
rabbits, Mary, the party, Joan, Beth. However one would like some way of
showing that this is the case, that is, a test for topics.

Two types of tests have been proposed in the literature: one type
uses paraphrase, the other questions. They tend to support the two different
approaches to topic noted above, although they are not restricted to these
approaches. Paraphrase tests support the canonical approach to topic, ques-
tions bring out the variability of topics.

In a paraphrase test for topic, one embeds a NP in a sentence asserting
its status as topic. The resulting sentence should accord with one's intui-
tion about the topic of the sentence, that is, what the original sentence is
about. Several paraphrases have been suggested; I use here sentences with
"about" and "speaking of". The former is due to Reinhart 1984, the latter
Kuno 1972.[8] They are illustrated in 2 and 3, which give paraphrases of 1a:

    2   He said about Barbara that she lives in Seattle
    3   Speaking of Barbara, she lives in Seattle

Although there is a certain unnaturalness about these sentences they capture
something of the notion of topic. The paraphrases accord with one's intui-
tions of what a sentence is about. Strikingly, if a non-topic NP is focussed
with "about" the result clashes with intuition. The examples demonstrate:
the (b) and (c) sentences extract different NPs in "about" paraphrases of the
(a) sentences.

    4a The rabbit is probably hiding in Alice's garden
    b   They said about the rabbit that it is probably hiding in Alice's garden
    c   They said about Alice's garden that the rabbit is probably hiding in it

    5a Mary bought a bicycle
    b   They said about Mary that she bought a bicycle
    c   They said about a bicycle that Mary bought it

    6a Beth brought out the queen to frighten William
    b   He said about Beth that she brought out the queen to frighten William
    c   He said about William that Beth brought out the queen to frighten him

Although the judgments are delicate, it seems to me that the (b) sentences
correctly represent what the (a) sentences are about; and the (c) sentences
do not. We will return to paraphrases with "about" and "speaking of" in a
later section.

Topicality can be demonstrated with question-answer sequences. In answer to a question concerning a given referent, a sentence is clearly about that referent. 7 illustrates:

7a What did Alison break?
 b She/Alison broke a glass

Question and answer are both about Alison: they have the same topic. On the pattern of pairs like 7 one can reconstruct a search question which a given sentence answers.[9] In 8 such pairs are given for the first three examples in this section.

8 ia Where does Barbara live?
    b Barbara lives in Seattle

   iia What did Mary buy?
     b Mary bought a bicycle

   iiia Where is the rabbit hiding?
      b The rabbit is probably hiding in Alice's garden

Pairs like this explicate the intuition that Barbara, Mary and the rabbit are the topics of the assertions. Note that the topic NP will always be familiar in the context of such question-answer pairs.

Question-answer pairs appear frequently in the literature on topics. They were perhaps first invoked by Kuno 1972 in discussions of pronominalization and variable topics. Carlson 1985 presents a very useful account of questions and answers in the framework of dialogue games.

1.3 The variability of topics

Pursuing the question-based approach to topic, we note that a sentence may be taken as the answer to more than one question. Search questions focus a constituent with a wh-phrase (Karttunen 1977), and set the stage for an answer. The members of a question and answer pair are about the same referent. Now since different NPs can be questioned in a given sentence, a sentence may have more than one topic-focus configuration. Consider 9-11 for example:

9 What did John Send?
                      11 John sent the silver teapot
10 Who sent the silver teapot?

11 may be taken as the answer to either 9 or 10; it has a different topic in each case. Such examples are easily multiplied. For example, the (b) sentences are presented in 12 as answers to questions that focus on their subjects; in 8 the same sentences are answers to questions focussing on different NPs.

12 ia Who lives in Seattle?
     b Barbara lives in Seattle

   iia Who bought the bicycle?
     b Barbara bought the bicycle?

   iiia Who/what is hiding in Alice's garden?
      b The rabbit is hiding in Alice's garden

The topics in these examples are the co-referential lexical NPs: the question context sets the topics of the assertions. (Recall that in isolation the topics of the assertions are taken to be their surface subjects.)

The variable approach depends on the occurrence of co-referential lexical NPs as the key to aboutness. Here topic is not a positional notion. The canonical and variable approaches to topic are presented as complementary rather than competing in the literature. For example Reinhart 1982 discusses the canonical position of topic as surface subject and also presents examples similar to 9-11 in which a sentence may be taken as the answer to more than one question.

2. Extending the analysis

2.1 We now ask whether the analysis of sentence topic can be extended systematically to texts. We will look at the topics of sentences in the context of other sentences, taking both the canonical and the variable approach. The question is, for a sentence in a text fragment, whether the sentence is about the topic NP referent. Previous work has considered sentences primarily in isolation and in the context of questions. In this inquiry I attempt to extend previous analyses to sentences in the context of other sentences. This discussion is limited to constructed written examples.[10]

The variable and canonical approaches to topic can be combined, as suggested above, to deal with sentences in context. A natural combination provides that a coreferential NP take precedence in establishing the topic of a sentence, and the canonical topic position serves as default. That is, the topic of a sentence is a NP coreferential with a previous NP; otherwise it is the NP in topic position, canonical or marked. The canonical topic is available if there is no coreferential topic NP. Something like this combination of the variable and canonical approaches is assumed in Reinhart 1982 although the relation between the two is not explicitly stated. Such an approach seems to be based on the assumption that sentence pairs are like question-answer pairs with respect to topics. It is assumed that one sentence sets the topic for another if they have co-referential NPs.

Note that in the variable approach the position of the topic is not an important factor. This notion of topic concerns only familiar information, and does not include syntactic and rhetorical considerations. It leads to an account of local text organization in which the surface structure of sentences plays a minor role. Sentences of a text are regarded as a network of references; syntactic or rhetorical position is relatively unimportant. Sentences topics are maintained with co-referential NPs. The canonical topic positions are available of course, either for topics or for emphatic or other purposes. Perhaps canonical topic positions would be important for the introduction of topics; this possibility is not addressed[11] here. The default account suggests something like this picture.

2.2 Examples: text fragments

We consider constructed text fragments on the pattern of question-answer pairs. In each fragment the second sentence has a NP coreferential with an NP in the first. We focus on the second sentence, (b). The question

is whether the aboutness relation holds, as predicted, between (b) and the topic referent--that is, in the context of sentence (a). The question of aboutness will be asked for both variable and canonical topic, that is, for co-referential NPs and surface subjects. 15 is from Reinhart 1980.

14a Alice left "The New Yorker" last year
  b "The Atlantic" hired her

15a This book is very boring
  b Rosa couldn't finish it

16a Amy caught a mouse in the garage last night
  b Jeremy killed it

17a John resigned from the committee yesterday
  b Mary invited him to her party anyway

These examples have coreferential NPs in different positions in S1 and S2, but never in the subject position of S2. Since subject is the canonical topic position, this distribution allows us to ask about both canonical and variable topics. We will be particularly interested in whether a coreferential NP overrides a subject NP as topic.

The question is, which NPs are topics of the S2 sentences? We investigate by applying the paraphrase tests for topic to both subject and coreferential NPs of the sequences. (The question test would not be appropriate because we are interested in the relation between S1 and S2, rather than the relation between S2 and a question.) Several versions of praphrase with "about" are presented, all of them, unfortunately, rather unnatural. Assume that Rosa, Mary, John, etc. have already been introduced in the text so that they are not particularly unexpected or unfamiliar.

18a Alice left "The New Yorker" last year
  b I said about Alice that "The Atlantic" hired her
  c I said about "The Atlantic" that it hired her

19a This book is very boring
  b I said about the book that Rosa couldn't finish it
  c I said about the book that she couldn't finish it

"I" is used as subject of the "about" sentences because it seems less unnatural than other subjects; pronouns and full NPs have been varied to make the sentences as natural as possible. But in spite of these efforts the resulting sentences are so unnatural in this context that they are difficult to interpret and evaluate.

However, I do not find an appreciable difference betwen the paraphrases: they seem equally good (or bad). That is, comparison of the (b) and (c) sentences is inconclusive. There is no clear topic NP, at least according to this paraphrase. Now consider sequences in which both sentences are prefaced:

20a They said about this book that it is boring
  b They said about the book that Rosa couldn't finish it
  c They said about Rosa that she couldn't finish the book

21a They said that Amy caught a mouse in the garage last night
 b They said about the mouse that Jeremy killed it
 c They said about Jeremy that he killed it

22a They said that John resigned from the committee yesterday
 b They said about Mary that she invited him to her party anyway
 c They said about John that Mary invited him to her party anyway

In my judgment the "about" paraphrases are equally appropriate: either
the subject NP or the coreferential NP can be focussed with "about."

In a third version of the paraphrase approach the sequence is pre-
sented and a paraphrase follows:

23a John resigned from the committee yesterday
 b Mary had just invited him to the official party
 c I said about John that Mary had just invited him to the official party
 d I said about Mary that she had just invited John to the official party

Again, it seems to me that both John and Mary are equally plausible as topics
of (b): the (c) and (d) paraphrases are both equally good or bad.

Now consider the same sequences with "speaking of" paraphrases, which
are perhaps less unnatural in context.

24a Alice left "The New Yorker" last year
 b Speaking of Alice, "The Atlantic" hired her
 c Speaking of "The Atlantic," it hired her

25a This book is very boring
 b Speaking of the book, Rosa couldn't finish it
 c Speaking of Rosa, she couldn't finish it

26a Amy caught a mouse in the garage last night
 b Speaking of the mouse, John killed it
 c Speaking of John, he killed it

27a John resigned from the committee yesterday
 b Speaking of John, Mary invited him to her party anyhow
 c Speaking of Mary, she invited him to her party anyhow

In these examples the (b) sentences are consistently more appropriate
than the (c) sentences. But the reason is not, I think, because they focus
on the NP that is intuitively the topic of the sentences. It is because of
the wording of the paraphrase. "Speaking of" suggests that the NP has
already been spoken of: this makes it appropriate with the coreferential
NP and rather inappropriate with a NP that does not appear in the previous
sentences. We correct for this by providing another sentence in the sequence:

28a Mary has worked with John for a long time
 b He resigned from the committee yesterday
 c Mary invited him to her party anyhow

The sentence of interest is (c): we construct "speaking of" paraphrases
with both NPs:

29a Mary has worked with John for a long time
  b He resigned from the committee yesterday
  c Speaking of John, Mary invited him to her party anyhow
  d Speaking of Mary, she invited him to her party anyhow

I find little difference in (c) or (d): both are appropriate.

At this point a worrisome explanation suggests itself: perhaps the "speaking of" paraphrase creates a topic NP (when appropriately prepared for with familiar NPs). If so the paraphrase changes the situation rather than testing it, at least in these contexts. This possibility can be explored a little further by setting up the appropriate context and picking a NP that is neither subject nor coreferential with a NP in a previous sentence. Such a sequence is presented in 30, adapted from Davison 1984.

30a Some wild rabbits are attacking the garden
  b The carrots and lettuce are doing very badly
  c Speaking of the garden, it needs fertilizer

This sequence seems impeccable, and it shows quite clearly that "speaking of" in such contexts does not test topics but creates them.

The paraphrase tests are interesting in several respects--because of their inconclusiveness rather than in spite of it. They do not confirm the hypothesis that coreferential NPs override topic position NPs as topics in sequences like those of 18-21. On the other hand they do not show that subjects override coreferential NPs. The tests' indefiniteness is important: it shows that aboutness, or sentence topic, is not clear and determinate for sentences in contexts. The contexts used here contrast with the context of questions, to which the sentences in question are taken as answers. This is our first result. It suggests more generally that the approaches and notions used with question-answer pairs cannot be extended directly to sentences in tests.[12]

The difficulty of identifying a topic also suggests that the assumptions with which we have been working need exploration and refinement. The assumptions are that a sentence is about its topic NP; and that topic NPs may be determined by coreferentiality or surface subject position.

2.3 Coreferential NPs and topic possibilities

This section presents additional data that bears on coreferential NPs and topics. Although such NPs are plausible topics in the examples above, a slightly wider range of data shows immediately that topics cannot be identified as coreferential NPs in a general account. There is no way to deal with sentences having two or more coreferential NPs without resorting to a more global notion of topic. Further, the approach leads to unacceptable results in some cases.

2.3.1 More than one coreferential NP

The idea that a coreferential NP overrides other NPs as topics runs into difficulty with sentences like 31b, where there is more than one such NP.

31a Mary ran into John yesterday
  b She invited him to the party

What is the topic of 31b? The "about" test produces reasonable sentences
with both coreferential NPs, suggesting that either one may be taken as
topic. I present two versions, one with full NPs and one with pronouns:

32a I said about Mary that she invited John to the party
  b I said about her that she invited him to the party

33a I said about John that Mary invited him to the party
  b I said about him that she invited him to the party

This inconclusive result is familiar from the text fragments considered
above.[13]

    Let us consider the situation more closely. Fragment 31 is short,
with little information: making reference to John and to Mary, it may be
"about" either one. More information might decide the question of what the
fragment is about. Investigating this possibility, we add another sentence
to the fragment. 34-36 are three versions of a longer fragment.

34a Mary ran into John yesterday
  b She invited him to the party
  c I hope he doesn't come

35a Mary ran into John yesterday
  b She invited him to the party
  c She's coming late

36a Mary ran into John yesterday
  b She invited him to the party
  c He turned her down

    These fragments present certain patterns, making it easier to decide
what they are about. In 34 NPs referring to John occur in all 3 sentences,
so one might say that they are about John. The sentences of 35 all have a
NP in canonical topic position referring to Mary, one might say that it is
about Mary. 36 is less clear because NPs with the same referents occur in
all three sentences: it is about John, Mary, or John-&-Mary.

    If a co-referential NP occurs in three consecutive sentences, it is
probably a matter of concern in those sentences. However the fragments above
show that this pattern of occurrence is not enough to determine whether the
sentences are about the NP in question. What would be decisive is a clearer
and larger pattern. We now have a paradox: in order to determine local
aboutness, we need information about general aboutness. I suggest that at
this point we are no longer dealing with a viable notion of local aboutness.

2.3.2 Problematic cases

    There is an interesting class of examples which casts additional doubt
on the idea that coreferential NPs in text fragments can be systematically
identified as sentence topics. Consider first the text fragment 37; this
example is from Reinhart 1982, one of the few papers to deal with assertions
in sequence:

    37a Dan is a nice fellow
      b Rosa invited him to the party

According to the variable topic approach, Dan, the referent of "him,"
is the topic of 37b. Now consider the fragment 38, in terms of indi-
vidual parts only a minor variant.

    38a Dan is a nice fellow
      b He invited Rosa to the party

In the variable approach the topic of 38b is also Dan, the referent of
"he."

      The difference between the fragments is that the roles of the corefer-
ential NPs are reversed in the (b) sentences. In 37b Dan is patient, in
38b Dan is agent. The problem is that we are forced in the variable ap-
proach to say that 37b and 38b have the same topic. Although the function
of topic has nothing to do with thematic roles, this seems an unacceptable
result. Most clearly unacceptable, I think is the claim that both (b)
sentences have the same topic; I also find it difficult to accept that
Dan is the topic of 37b.

3. Reprise: question answer pairs and aboutness

      Serious difficulties have been encountered in the program of using
the variable and canonical approaches to topic for sentences in context.
Apparently neither approach can identify the NP that such sentences are
about. Indeed, it is not clear that there is a viable general notion of
local aboutness. This does not preclude the possibility that a NP deter-
mining local aboutness can sometimes be identified. But it seems that
such NPs cannot be predicted and identified in a general way, on the
basis of structure (taking co-referential NPs to be part of structure).

      The inconclusive nature of our findings leads us to look more closely
at aboutness in question answer pairs, the apparent basis for the variable
approach to topic. We then return to the notion of local aboutness.

3.1 Question-answer sequences and aboutness

      In the question-answer sequences above the question sets the topic
for the answer, and the topic is the co-referential lexical NPthat appears
in both. This is quite plausible for sequences like 9-11, repeated here:

    9 Who sent the silver teapot?
                          11 John sent the silver teapot
    10 What did John send?

The pair 9-10 have "the silver teapot" as topic NP, and the pair 10-11 have
"John" as topic NP: In these question-answer pairs the variable approach
is successful in identifying sentence topics, giving clear and intuitively
correct results.

      The success of the variable topic approach in 9-11 leads us to look
carefully at the structure of questions and answers. The informational
structure of questions is an important distinguishing characteristic.

Search questions are organized into two parts, the focussed wh constituent and the rest, which is presupposed. Following Heim 1982, I assume that the existence of definite NPs is presupposed either by prior knowledge or by accommodation.[14] The implicit assumption in discussions of questions has been that the presupposed material is organized in such way as to make the topic identifiable.

In asking 9, I presuppose that someone sent the silver tray; in asking 10 I presuppose that John sent something. The presupposed NP is the NP identified as topic, and this accords with intuition. However, these are simple sentences. Since "John" is the only presupposed NP in 10 it is an accident, in a sense, that identifies presupposed NP with topic NP. We can conclude little about the structure of presupposed material in general.

We need other examples. I offer two question-answer pairs, that are only slightly more complicated than the ones presented above. In the questions the wh-phrase NP is focus and the rest of the sentence is pre-supposed. What is the topic NP?

39a Who gave the poinsettia to Mary?
 b John gave the poinsettia(it) to Mary (her).

40a What did Mary put in the basement?
 b Mary (she) put the puppies in the basement (there).

The topics of these pairs cannot be clearly identified, it seems to me. The matter of concern is inconclusive: the pairs might be about either co-referential NP. The structure of the questions does not identify the topic; and the variable approach is useless for the answers because they have more than one co-referential NP. The problem is familiar, of course, from asser-tions. In 39 the canonical approach to topic is useless because the wh-phrase is surface subject; in 40 the canonical approach makes Mary the topic without using anything peculiar to questions.

There seems to be nothing in the question structure that determines or indicates what a question is about: 39a might be about the poinsettia, Mary, or neither. And as Kuno 1972 points out, a sentence like 39b might be a neutral answer to the question, "What happened?" In fact I see no princi-pled basis for extending the analysis of simple question-answer sequences, in which one presupposed NP appears, to more complicated questions. Although the search question structure focusses on a single wh constituent, it does not organize the presupposed material. The non-focussed part of a question and answer is no more clearly organized around a particular NP than is an assertion.

It should be noted that English has some structures that are clearly organized around a topic NP. One type is an imperative or request such as 41, which is similar to examples in Kuno 1972:

41a Tell me about Betsy
 b Xerox hired Betsy last week

In the context of (a), (b) is clearly about Betsy. Another type is a left-dislocated structure such as 42:

42 Betsy, they hired her last week

But except for cases like this we have found little support for the idea
that sentences in context are organized around a topic NP. We now return
to other arguments for topic organization, that relate to the representa-
tion of sentences and storage of information.

3.2 The representation of sentences

According to Mathesius, a sentence is taken as a comment on its topic.
A sentence is organized around the referent of the topic NP: in predi-
cating something of the referent, it increases our knowledge of that refer-
ent. If this is true of sentences in texts it should be relevant to the
way people understand such sentences. One would expect such an organiza-
tion to be reflected in the way the information of a sentence is structured,
and stored in memory. We consider these questions very briefly in terms
of additions to memory and the representations of texts.

An interesting attempt to elucidate the notion of topic in terms of
information context is given in Reinhart 1982. The idea is that the
topic of a sentence indicates how its information is added to context.
Reinhart assumes a model of text and discourse in which the information
given by a sentence increments the context, following Stalnaker 1979.
She also assumes that information is stored and located according to a
referent or referents to which it is pertinent.

The proposal is that the sentence topic provides the rubric under
which the information of the sentence increments the context and is
located in memory. To understand what this proposal means consider
examples 43 and 44, using the canonical notion of topic:

    43 The rabbits are eating the cabbages in Alice's garden
    44 the cabbages in Alice's garden are being eaten by the rabbits

Since the topic of 43 is "the rabbits," the information of 1b increments
the context as knowledge about the rabbits. In 44 the topic is "the
cabbages in Alice's garden" and the information of 44 would be stored
under that rubric. Thus the context is incremented according to the topic
NP of a sentence. Reinhart puts it this way: "...the difference (between
sentences with different topics) lies in the internal organization of the
context set...NP sentence-topics will be referential entries under which
we classify propositions in the context set and the propositions under
such entries represent what we know about them in this set" (p.24). Just
how the proposal is to be worked out is not clear. To see how topics would
affect the contribution of a sentence to background knowledge we would
require a general account of how the context set is organized.

But we can pursue the basic idea that topics affect the way a
sentence increments context. I consider first the issue of how the
information of a text cumulatively affects the database associated with
the text. I then raise the question of whether topics should be part of
a representation such as that of Kamp's Discourse Representation Theory.

The information provided by the sentences of a text is presumably
added as it comes in--that is, sentence by sentence--to the database in
a systematic manner. How would the information be added to a database?
Following Reinhart's suggestion, the referent of the topic NP would be
the only location for the information. But this seems implausible.

Surely all the referents of NPs in a sentence would be upadated reflecting
how the sentence affects them. Both 43 and 44 would lead to the addition
of information about the rabbits and the cabbages, for instance. The
point can be made clearly with a more drastic example. Consider 45, in
a local context about John, where John is in an antique store examining a
rare Chinese vase.

    45 John broke the vase

The rare Chinese vase is now a broken one. This information would have
to be available as an attribute of the vase as well as something about
John. In the light of such examples, it is reasonable to suppose that
information is stored for all the entities referred to in a sentence,
however the information is presented.[15]

There remains the question of whether sentence topic should be
included in a representation of text structure such as that of Discourse
Representation Theory (Kamp 1979k 1984) or file card semantics (Heim 1982).
Following Kamp and Heim, I assume that sentences are added to context in a
cumulative discourse representation structure, which represents the con-
tribution of sentences to a text.

A discourse representation structure (DRS) has entities that represent
the referents introduced and referred to, and the events and states pre-
sented, in the text. Note that having events and states in a DRS allows
for neutral organization of information. This is significant since we
have failed to find evidence that sentences in texts are organized in
terms of topic NP referents.

It would be possible to include in a DRS information about sentence
topic; but we have found nothing to require it, semantically or pragmati-
cally. Apparently sentences in texts are not generally organized in terms
of the referent of a sentence topic. It remains to be seen whether other
types of evidence make it desirable to include this sort of information.
Sells 1985, for instance, argues that DRS should represent information
about the notions source, self, and pivot to account for the correct inter-
pretation of logophoric pronouns. Sentences with grammaticized topics are
different; there is evidence that grammaticized topic is relevant to the
interpretation of pronouns, cf the conjunctions noted in Oehrle 1979.[16]

We have to conclude that the relation of aboutness does not generally
hold between the referent of a topic NP and the other material of a sen-
tence, for sentences in English text fragments. The conclusion is not
really a surprising one. The relations that obtain in texts are complex;
and many such relations depend on inferences that go beyond the explicit
material in a sentence. This suggests that if there is a reasonable notion
of local aboutness for English, it will not be stated at the level of the
sentence.

This study supports the distinction between subjects and topics:
subjects do not appear to have the properties of grammaticized topics.

Finally, I want to note that there is an important sense in which
the traditional topic, the surface subject NP, affects how sentences of
a text are understood. The subject of a sentence gives a particular
orientation which contributes to the point of view of the sentence. (The

term orientation is due to Noonan 1977.) In the recent literature this idea has been expressed and investigated in various ways: cf the discussions of point of view and related notions in Kuno & Kubaraki 1977, MacWHinney 1978, Banfield 1982, Carlson 1985.

The choice of a particular subject has various consequences. Some are clearly syntactic: they include possible sentence adjunctions that require coreferentiality with the subject, case-marking (DeLancey 1981, O'Connor 1985), logophoricity (Sells 1985). Other consequences are lexical. These factors contribute to the orientation of a sentence, and to the point of view presented. Related current work explores the ramifications of grammaticized topics (e.g. Bresnan & Mchombo 1986 on agreement). The papers mentioned above testify to the vitality of this research area.

NOTES

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[1]Brown and Yule 1983 present in chapter 3 a useful discussion of some leading problems and approaches in the area.

[2]Work in AI, particularly by Grosz and Sidner on topic and focus, suggests something like this; their view of topic doesn't correspond to sentence topics.

[3]See Levinson 1978, van Dijk 1977.

[4]Cf the work of Prague School linguistis (Firbas 1964, Danes 1974, among others) and Kuno, Reinhart, & Gundel; references to the second group are made throughout the text.

[5]More precisely, there is a continuum between subject and topic languages. Not all languages can be characterized as one or the other. a number of Phillippine languages, for instance, are neither subject nor topic languages; cf Schnachter 1976.

[6]This is the approach that has been most influential. Actually there are several theories concerning these matters, but the others will not concern us here. See Firbas 1964 for discussion.

[7]Davison 1984 argues that topic NPs have a particular status with respect to sentence processing.

[8]There are other Kuno paraphrases; I do not use them here because they focus on contrastive or neutral interpretation.

[9]Answers like this are what Carlson calls syntactical direct answers: "The syntactical direct answers to any question are the several immediate subformulas of its presupposition...in search questions direct answers consist of substitution instances of the existential presupposition." (1985:27)

[10] My justification for using constructed written examples is that they are controllable, and that there is a body of literature pertaining to them. I plan to use real examples in a subsequent paper.

[11] Something like this approach is presented in Sidner, although she does not deal directly with the phenomenon of topic; a similar idea is put forward programmatically in Smith 1985.

[12] See Carlson 1985 for detailed discussion of question-answer pairs and their role in discourse.

[13] Sidner 1981 attempts to deal with examples like this by invoking an additional factor, the agentive. Sidner's inquiry deals with the interpretation of pronouns and uses a notion of focus that is not unlike the notion of aboutness.

[14] In questions conversational implicature accounts for presuppositions. I accept the arguments of Karttunen and Peters 1977 that presuppositions are treated variously.

[15] This point weakens Reinhart's claim that the notion of sentence aboutness is different from that of semantic aboutness. She notes that from the semantic point of view a sentence is about all of its designating expressions; but says that a given sentence has only one topic in a given context. Yet we have seen that from the point of view of information the semantic notion prevails. In any case it is not clear that a neat division between the pragmatic and semantic can be maintained when dealing with these issues. (See fn 16.)

[16] Anaphora resolution shows that sentence topic is relevant to semantic interpretation in at least some cases, as Reinhart acknowledges. Oehrle 1979 gives examples like the following:

Speaking of Bill, John hit him and then he hit Sam

Oehrle observes that the pronouns "him" and "he" are taken as coreferential with "Bill" in this sentence. The simple conjunction has a different interpretation (without contrastive stress):

John hit him/Bill and then he hit Sam

Without contrastive stress "he" is taken as coreferential with "John" rather than with "him" (or "Bill").

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THE CASE AGAINST PLAIN VANILLA SYNTAX*

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The adequacy of phrase structure theories of syntax has been in question for thirty years; despite the empirical attractions of such theories and their conceptual simplicity, it has seemed to many that these theories must be abandoned completely in the face of a long catalogue of defects. This paper first gives a careful account of the assumptions lying behind an utterly simple, or *plain vanilla*, (phrase structure) syntax, and then lists the presumed deficiencies of such a theory. The point of these exercises is to demonstrate what a theory of syntax must be able to do, and to show just how plain vanilla syntax falls short. More adequate theories of syntax can then be seen as particular packages of amendments to the basic model.

1. The issue. Transformational syntax arose in the context of American structuralism. Its immediate antecedents were *phrase structure* (or *constituent structure*) approaches to syntax, exemplified by three papers collected in Joos 1966 (Harris 1946, Bloch 1946, and Wells 1947). Chomsky (1957) observed that such approaches associated syntactic theory with discovery procedures - he argued that this association placed unreasonable demands on syntactic theory - and related such approaches to fully formalized models for the description of syntax. On the second score, the topic of this paper, Chomsky's (1956) formalizations (while making a major contribution to a new branch of discrete mathematics[1]) gave rise to two fundamental questions in syntax: Do these formalizations adequately capture the intentions of syntacticians like Harris, Bloch, and Wells? In any event, are the formal systems adequate for the description of the syntax of all languages?

Chomsky (1957) and Postal (1964) argued that the syntactic proposals of the American structuralists could all be interpreted as versions of *context-free grammar* (CFG), and they maintained that CFG was provably inadequate as a theory of syntax. On the textual issue, the question of whether CFG fully reconstructs the proposals of syntacticians like Bloch and Harris, I shall have little to say here; undoubtedly the core of each of these proposals is CFG, but virtually every one has features (often not formalized) beyond those of unadorned CFG, so that a case can be made on either side.

On the issue of adequacy, I shall have a great deal to say. The fact that early champions of transformational syntax cited multiple inadequacies of CFG and drew much of their evidence from familiar languages suggested quite strongly that no language is a context-free language (that no language has a context-free syntax) and provided considerable support for abandoning CFG in favor of some less simple and more powerful theory, such as transformational syntax. Such exceedingly powerful theories are attractive largely because they appear to provide solutions to *all* of the presumed inadequacies of CFG at once.

I outline (in section 2) a particularly stark and unadorned version of syntactic theory, according to which every language has a context-free syntax. Like the approaches of the American structuralists, this theory (which I dub *plain vanilla* (PV) syntax) takes as the central observation about sentences the fact that they are organized hierarchically. And in common with most varieties of American structuralist and transformationalist syntax, it identifies syntax as one autonomous component among a number of components in a full grammar of a language.

In taking hierarchical organization as the fundamental syntactic property of sentences, PV syntax contrasts with theories that focus instead on the head/modifier relation (as in dependency grammar, as summarized by Matthews 1981: 78-84), on grammatical relations like subject and direct object (as in the relational grammar of Perlmutter and Postal – see their papers in Perlmutter 1983), on the semantic and pragmatic functions of syntactic units (as in the role and reference grammar of Foley and Van Valin 1984), or on gap-filler and anaphoric relations (on the former as in the base generated syntax of Brame 1978, on both as in the government and binding syntax of Chomsky 1982). In insisting on hierarchical organization as the one central syntactic property, PV syntax also contrasts with theories in which two or more properties play a focal role: with, for instance, the daughter dependency grammar of Hudson (1976), the corepresentational grammar of Kac (1978), and the lexical functional grammar of Bresnan and Kaplan (see Bresnan 1982).

Section 3 summarizes the case against PV syntax. Much of this is familiar ground. Every textbook of transformational syntax provides some 'arguments for transformations' (which is to say, arguments that a much simpler phrase structure theory is inadequate), though different texts emphasize different arguments. And theoretical works have regularly cited one or another of the faults of PV syntax as support for other models, though again there has been no synthesis or summary of the evidence.[2] My intention here is not to dash cold water on CFG as a framework for syntax – in fact, I am recommending that phrase structure approaches as in Gazdar (1982) be vigorously explored – but rather to make it as clear as possible what conditions might be required of a syntactic theory that is to be fully adequate. Section 4 contains a few reflections on the lessons of section 3.

2. Plain vanilla syntax in summary. Three aspects of PV (or, indeed, any) syntax must be specified: first, the nature of the objects described by the syntactic rules (A and B below); second, the nature of the rules themselves (C); and third, the place of the syntax in a full grammar (E).

The first aspect I treat in two parts, both framed in tree terms: one (A) having to do with syntactic structure in a narrow sense, that is, with the hierarchical and sequential organization of words and phrases within sentences (in tree terms, with relations between nodes in trees); the other (B) having to do with the set of syntactic categories (in tree terms, with the stock of labels on nodes in trees) and its relationship to syntactic structure. In addition, the program of constituent structure grammar, both in its original structuralist versions and in later generativist developments, has had a distinctly formalist cast. Part D below gives explicit voice to some of the formalist assumptions of the program.

One complication in this discussion is, I believe, unavoidable. In order to represent what is intended in pretheoretical observations about constituent structure, it is necessary to distinguish two slightly different notions of 'constituent structure' — *preterminal structure*, which is purely syntactic (and so contains no information about particular lexical items) and *terminal structure*, which is preterminal structure as augmented by pointers to specific lexical items. The sentences <u>Birds</u> <u>eat</u> and <u>Birds</u> <u>drink</u> have 'the same constituent structure' in the sense that their preterminal structures are identical; but they are not 'the same constituent structures' (they would not count as identical for the purposes of ellipsis, for example), because their terminal structures are different. I discuss only preterminal structures in B, reserving terminal structures for the presentation of assumptions about the lexicon in E1.

A. Relations between nodes in trees

A1. The theory of syntax refers to exactly two primitive relations between nodes in a tree: immediate dominance, the relation of mother to daughter; and immediate precedence, the relation of left sister to right sister.

A2. The Single Mother Condition: A node has no more than one mother.

A3. The No-Tangling Condition: If nodes M and N are sisters, then none of the descendent nodes of M is a sister of any of the descendent nodes of N.

A4. The Acyclic Condition: No node is the mother of one of its ancestor nodes.

A5. The Unique Root Condition: There is only one node without a mother.

A6. The Total Ordering Condition: All sister nodes are linearly ordered with respect to one another.

B. Node labels

B1. The number of node labels is finite.

B2. Every node has a label.

B3. No node has more than one label.

B4. The set of labels can be exhaustively partitioned into two (nonempty and disjoint) subsets, of *phrasal* and *lexical* labels.

B5. The set of phrasal labels has a designated member, the 'initial symbol' S.

B6. Labels are unanalyzable wholes.

C. Syntactic rules

C1. A syntax for a language is a finite set of rules.

C2. Taken together, these rules define a set of preterminal structures.

C2a. Preterminal structures are objects of the sort specified in A and B above. Accordingly:

C2a1. A rule may concern the branching of a mother node with a specified label M into daughter nodes with specified labels $D_1,...,D_n$.

C2a2. A rule may concern the linear ordering of a set of daughter nodes with specified labels.

C2b. Preterminal structures constitute the only type of syntactic representation provided in a grammar.

C3. Rules are positive only; a rule licenses a particular branching or linear ordering. There are no negative (syntactic) conditions, or (syntactic) filters.

C4. A rule specifies the linear ordering of a set of daughter nodes by means of the operation of concatenation.

C5. Each rule both licenses some branching and specifies a linear ordering of the daughter nodes. Accordingly, each rule can be expressed in the form $D_1...D_n = M$.

C6. Rules receive the generative interpretation (as opposed to the parsing interpretation or the checking interpretation; see the Introduction to Dowty, Karttunen, and Zwicky (1985)). That is:

C6a. A rule of the above form is to be understood as licensing the replacement, within some partial tree, of a node with label M by a subtree having a mother node labeled M and n daughter nodes labeled, from first to last, D_1 through D_n. In more familiar phrasing, the rule expands the symbol of the mother into the symbols of the daughters, in order: $M ---> D_1,....D_n$.

C6b. A tree represents a preterminal structure described by the syntax if, and only if, it satisfies three conditions: (i) it has a root node labeled S; (ii) it can be obtained by successive expansions, each

licensed by a rule of the syntax; (iii) no further rule of the syntax is applicable to it. (Condition (iii) ensures that no phrasal category symbol is left dangling because an applicable rule has not been used.)

C7. There is a rule with mother label M if and only if M is a phrasal label. In more familiar terms:

C7a. No syntactic rule expands a lexical category symbol.

C7b. Every phrasal category symbol is expanded by some rule. This condition ensures that no phrasal category symbol is left dangling because there is no rule to rewrite it.

C8. The number of daughters in a rule must be at least 1. This condition ensures that there are no dangling phrasal category symbols stipulated by the grammar, which is to say that there are no 'zero expansions' of such symbols.

C9. Rules are not subject to conditions referring to context:

C9a. Rules are not subject to conditions referring to horizontal context; their applicability cannot be conditional on the nature of the mother's sister nodes. That is, they are not 'context-sensitive'.

C9b. Rules are not subject to conditions referring to vertical context; their applicability cannot be conditional on the nature of nodes ancestral to the mother or descendent from a daughter.

C10. There are no constraints on the application of rules.

C11. There are no generalizations over sets of rules.

C11a. There are no existential generalizations, or *rule schemata*.

C11b. There are no implicational generalizations, or *metarules*.

D. Substantive content not assumed

D1. The stock of node labels from which those in any particular grammar are drawn is not assumed to be finite; new labels can be devised as needed in any particular grammar.

D2. The stock of node labels is not assumed to be universally specified.

D3. Node labels are not assumed to have any intrinsic content, any 'meaning' outside the formal system of grammar.

D4. The list of possible rules is not assumed to be finite; new rules can be formulated as needed in any particular grammar.

D5. The list of possible rules is not assumed to be subject to any universal constraints on form; in principle, any configuration of symbols meeting the conditions in C is a rule.

D6. The list of possible rules is not assumed to be subject to any universal constraints on substance, having to do with the 'meaning' of rules outside the formal system of grammar.

E. Components of grammar

E1. Lexicon

E1a. The lexicon is a finite collection of *lexical entries*.

E1b. Each lexical entry is a quintuple of representations, together with an index serving as a name for the lexical entry.

E1c. The five types of representations are: syntactic, morphological, phonological, semantic, pragmatic/stylistic. Each is germane to the operation of a component of grammar other than the lexicon itself.

E1d. These representations are structured constructs of properties.

E1e. The lexicon articulates with syntax via, and only via, a finite set of rules deriving terminal structures from preterminal structures.

E1f. Each such rule is of the form $L \dashrightarrow I$,

E1f1. where L is a lexical label,

E1f2. and where I is the index of a single lexical item,

E1f3. whose syntactic properties do not make it distinct from L.

E1g. There are no useless rules of this sort:

E1g1. There is at least one such rule for each lexical label.

E1g2. There is at least one such rule for each index.

E1h. There are no generalizations (*lexical redundancy rules*) relating properties of lexical items to one another.

E2. Morphology

E2a. The morphological representations of lexical items are labeled tree
     structures, formally of the same type as those presented in A and B
     above, with the following exceptions (cf. B4 and B5):

E2a1. The set of morphological labels is disjoint from the set of phrasal
      labels of syntax.

E2a2. The set of morphological labels can be exhaustively partitioned into
      two (nonempty and disjoint) subsets, of *constituent* and *morpheme*
      labels.

E2a3. The lexical labels of syntax are all constituent labels of
      morphology.

E2a4. Every lexical label of syntax is an initial symbol of morphology,
      and no other labels are.

E2b. There is a finite set of *word formation rules*, whose function as a
     set is to describe the morphological representations in a potential
     lexicon.

E2c. These rules are formally entirely parallel to the phrase structure
     rules of syntax as presented in C above, with constituent labels
     and morpheme labels playing the roles in morphology that phrasal
     labels and lexical labels, respectively, play in syntax.

E2d. The provisos of D above apply to the labels and rules of morphology.

E3. Semantics

E3a. Semantics provides semantic interpretations for terminal structures.

E3b. The interpretation for a node with a lexical label, dominating a node
     labeled with an index, is the semantic representation in the
     lexical entry having that index.

E3c. Semantics is 'rule-to-rule': For each syntactic rule with mother
     label M and daughter labels $D_1...D_n$, there is a principle by which
     the semantic interpretations of the D_i can be regularly related to
     the semantic interpretation of M. By this means, interpretations
     are assigned to phrasal nodes in a terminal structure.

E3d. Other principles express equivalences and implicational relationships
     between semantic interpretations.

E3e. Others place conditions of well-formedness on semantic
     interpretations.

E3f. However, semantic principles are *positive* only; there are no
     explicitly negative semantic principles, or *semantic filters*.

E4. Pragmatics/Stylistics

E4a. Stylistic, registral, discourse-structural, etc. information may be associated with the constructs provided in terminal structures, that is, with particular lexical items, with lexical categories, with phrasal categories, and with constituent structure configurations.

E4b. Such information is associated with syntactic phenomena only in this fashion.

E5. Prosody/phonology

E5a. Terminal structures provide the domains within which rules of sentence prosody apply, and supply all the nonphonological information available for conditioning or constraining such rules.

E5b. The terminal structures of syntax and those of morphology, taken together, provide the domains within which phonological rules apply, and supply all the nonphonological information available for conditioning or constraining such rules.

E6. Syntax is autonomous

Syntactic rules are not subject to any conditions or constraints referring to

E6a. the morphological composition of words,

E6b. the prosodic features of phrases,

E6c. the phonological features of words or phrases,

E6d. the semantics of the construct or of the constituents involved, or

E6e. the pragmatic/stylistic effects of this construct or these constituents.

3. A checklist of presumed inadequacies of PV syntax. I now turn to a compact presentation of all types of defects that I know of that might be laid at the door of PV syntax.

A. Inabilities in principle

A1. The basic black, or total, inadequacy. The *stringset* associated with any particular PV syntax - the set of strings of words appearing at the bottom of terminal structures - is context-free (CF). There are, it has been claimed, natural languages that do not have CF stringsets; if so, PV syntax is fundamentally inadequate. Pullum and Gazdar (1982) disputed all such claims in the literature, but Pullum (1984a, b) concedes that there might indeed be natural languages with non-CF stringsets.

There are several possible complexities here. The constructions at issue might be very rare across languages (like the particular sort of object incorporation found in Mohawk) or they might be of very marginal status in their languages (like the _respectively_ construction in English). Faced with valid but rare phenomena, one might claim, unsatisfactorily, that natural languages were 'mostly' CF. Faced with examples of marginal status, one might claim either that (a) the troublesome constructions do not belong to the 'core syntax' of the language in question (a risky proposal, in the absence of supportable guidelines for distinguishing the center of language from its periphery), or that (b) the conditions on the troublesome constructions are to be described not by syntax, but rather by principles of semantics, or by extragrammatical principles (Pullum and Gazdar dispose of several apparently damaging cases in this fashion). It is also possible that PV syntax can be amended so that the resultant theory countenances only a small extension of the set of CF languages; this is the tack taken in such works as Joshi (1984) and Pollard (1984).

A2. Sublethal but very unpleasant. Here I refer to cases in which, it is claimed, a CF syntax can describe the stringset of a language...but there is no CF syntax that correctly describes the _constituent structures_ of the language. If this is so, then the information supplied by any CF syntax for the language is deficient; cf. section D below. Worse, the structures that are supplied will be inappropriate for the functioning of other components of grammar (semantics, lexicon, and phonology, in particular); cf. section E below.

B. Gigantism

Beyond the presumed inadequacies-in-principle of the preceding section, the standard criticisms of PV syntax amount to saying that it is clunky, inelegant, unilluminating. There are four prongs to this criticism, taken up in this section and the three following it:

--Gigantism;

--Irretrievable loss of generalizations;

--Missing information;

--Insufficient support of other components.

The criticism of gigantism turns on the fact that a moderately adequate PV syntax for a natural language has an astounding number of necessarily distinct syntactic categories, and an even more astounding number of phrase structure rules, that is to say, a quite astounding diversity of (surface) constituent structures.

To see how the number of categories and rules expands as a PV syntax for a language moves towards adequacy, one has only to consider the problem of describing English NPs. To account for the mutual restrictions between various determiner types (including the absent determiner in _museums_ and _rice_) and singular count, plural count, or (singular) mass

nouns, the place of the single category Det must be filled by several (six, in fact) categories, and the place of the single category N must be filled by at least three categories, NSg, NPl, and NM. Moreover, the category Nom (functioning in the rules NP ---> Det Nom, Nom ---> AP N) must be divided in the same way as N, into NomSg, NomPl, and NomM. And of course the rules referring to NP, Nom, N, and Det must be replaced by rules referring to NPSg, NomM, NPl, and the like.

In this replacement categories like Nom simply disappear. Labels like 'NomPl' are indivisible entities. The categories replacing Nom could just as well have been 307, 578, and 722; names like 'NomPl' are chosen for their mnemonic value, but 'NomPl' is just as distinct from 'NomSg' as '307' is from '578', or 'Zebra' from '#@$2'. The categories Det, Nom, and N have been *atomized* out of existence, in favor of a set of new categories.

Our original rules have also been atomized. Where there were once the two rules NP ---> Det Nom and Nom ---> AP N, there are now many.

Clearly, the atomization of categories and rules will only increase when we consider further facts about the internal composition of NPs in English, not to mention further facts about the distribution of noun phrases in sentences (obviously, NPSg and NPPl will have to be distinguished, if subject-verb agreement is to be described, and that is only the beginning of our troubles).

The problem with atomization is not just that the whole syntactic apparatus becomes unwieldy. The real problem is that it is mind-boggling to suppose that the description has any psychological reality whatsoever - that is, that speakers of English, or any other language, somehow assign a constituent to one out of an astronomical (or larger) number of categories, or that these speakers have provided any sort of indvidual internal representations for a set of rules whose number may well exceed the number of neurons in the brain. (Note the diminishing returns of CF-ness here: CF syntaxes are vastly more learnable, in the technical sense, than more powerful syntaxes, but as the number of categories and rules explodes towards astonomical size, or even beyond, it becomes less and less likely that human beings could experience the necessary inputs in the time available to them, no matter how quick they might be at inducing CF syntaxes.)

Moreover, as we shall see in the next sections, as the number of categories and rules increases, the amount of information directly represented in constituent structures decreases; as a result, it is more and more difficult to see the set of rules as a repository of generalizations about the syntax of the language; and the syntactic description is less and less satisfactory in its interfaces with other components of the grammar. The four species of clunkiness shamble along hand in hand.

C. Loss of Generalization

C1. Gigantism and lost generalizations.   The loss-of-generalization criticism is the other side of the gigantism coin. If you've got a quarter of a million rules, it's very hard to find any generalizations in them.

Much worse, when categories and rules are atomized there is no direct way to refer to categories or construction types; the only way to manage such reference is by lists, and nothing in the syntax will associate one such list with another. To see the sort of problem that arises, consider the rules needed to achieve the effect of subject-verb agreement in English declarative sentences, then to describe yes-no questions, including their agreement possibilities. Each declarative rule has an interrogative counterpart, but this generalization will nowhere be made (indeed, the system would be simpler if some or all of the counterpart rules were absent), and there will be no entity that we could identify as 'declarative sentence' or 'yes-no question', just as there will be no N entity or S entity.

C2. Missing information and lost generalizations.   The loss-of-generalization criticism also lies behind all the criticisms having to do with information that is not represented in constituent structures: if the information isn't there, there are no generalizations about it. Insofar as there are syntactic generalizations to be made in terms of Subject, Direct Object, and Indirect Object relations to verbs...or in terms of coconstituency between nonadjacent elements...or in terms of transformational relatedness...or whatever from the list following in section D: If constituent structures do not contain this information, the generalizations cannot be stated.

Even when the information is available, if it is not *directly* represented, then the appropriate generalizations cannot be stated. They will instead be dissociated into a swarm of instances. If the pairs of constituents that stand in a determining-determined relationship with respect to agreement have to be listed, for instance, then any generalization dissolves. If lexical and phrasal categories are atomized, then generalizations explode into lists of subcategories.

C3. Types of missing generalizations. There are two different sorts of missing generalizations. The first is an *existential* generalization over rules, a statement that anything of a specified form is a rule of the language. The second is an *implicational* generalization over rules, a statement that predicts the existence of one set of rules on the basis of the existence of another. Stating either sort of generalization will require that we treat category names as complex and divisible entities.

D. Missing information

Claims that particular types of information are missing - that is, not represented - in constituent structures vary in their import. The less potent variety involves types of information that could be reconstructed from what is present in constituent structures, but are not

directly represented there. The more potent variety involves types of information that are, it seems, in principle not reconstructible from the information in constituent structures. The potency of any individual case is, alas, not always easy to determine. The claim that some sort of information is 'missing' presumes, of course, that it *ought* to be present in, or at least reconstructible from, an adequate syntactic description. This is a claim about the goals of syntactic theory. One response to a missing-information criticism of PV syntax is simply to maintain that there is no reason to suppose that a syntactic description must register head/modifier relations, systematic paraphrase relationships, anaphoric linkages, or whatever the type of information at issue is. So far as I can see, there are two variants of this response: (a) the respondent proposes that the information in question plays no role whatsoever in grammatical description, that it figures not at all in generalizations about linguistic form; (b) the respondent proposes that the information is indeed relevant to the workings of a whole grammar, but maintains that the information plays no role in syntax, only in some other component or components.

There are then four possible responses to the observation that PV syntax lacks some type of information:

--Totally Irrelevant: The information is not linguistically relevant.

--Syntactically Irrelevant: The information is linguistically, but not syntactically, relevant.

--Syntactically Relevant But Obscure: The information is syntactically relevant; it is not directly represented in constituent structures but can be derived from them.

--Syntactically Relevant But Absent: The information is syntactically relevant, but cannot be reconstructed from constituent structures. The inadequacies of PV syntax that seem to involve syntactically relevant, but obscure or absent, information, are the darlings of the literature on transformational grammar. All of the standard 'arguments for deep structures' and 'arguments for transformations' concern missing information. I now enumerate these.

D1. The difference between the 'slot' filled by a constituent (its 'external syntax', which concerns its cooccurrence and alternation with other constituents and its ordering within larger constructs) and the 'fillers' of the constituent (its 'internal syntax') is not generally represented. (Note that in some instances this difference can be coded in constituent structure by assigning a constituent to two different categories, as when penguins can't fly in I know penguins can't fly is assigned to S, on the basis of its internal syntax, and also to NP, on the basis of its external syntax.)

D2. Specific types of relations between coconstituents are not (directly) represented: what PV syntax tells us about two constituents is only that they are sisters; PV syntax does not represent any dependency of

one on the other, much less any specific type of dependency.

D2a. Head/modifier relations are not represented; despite the mnemonic similarity in labels, nothing says that N is the head of NP, V of VP, etc.

D2b. Consequently, the distinction between endocentric and exocentric constructions is not represented.

D2c. Relations between syntactic operators and their operands are not systematically represented; in particular, grammatical relations between verbs and their various NP arguments are not (fully) represented - neither the fact that some NP is related to one V and not to another, nor the particular relation it bears (Subject, Direct Object, etc.).

D2c1. In particular, the fact that one NP can bear several different relations with respect to different Vs (as in _Geoff intended to be hard to persuade_) is not represented.

D2c2. Similarly, the fact that, for different purposes, a single NP can bear different relations with respect to a single V (as _penguins_ does with respect to _are_ in _There are penguins on the porch_) is not represented.

D2d. Relations of selection among coconstituents are not represented.

D2e. Relations of subcategorization among coconstituents are not represented.

D3. The topic constituent of a sentence is not distinguished, nor its focus constituent(s).

D4. Dependencies between noncoconstituents are not represented. There are at least two important subtypes (beyond the dependencies already mentioned, all of which can involve noncoconstituents as well as coconstituents).

D4a. Redundant marks.

D4a1. The relationship between the determining element and the determined element in grammatical agreement is not represented.

D4a2. The relationship between an element in one part of a structure and its repetition in another part is not represented.

D4a3. The ('agreement') relationship between an anaphor and its antecedent is not represented.

D4a4. The relationship between a governing and a governed element is not represented.

D4a5. The fact that some other marks are predictable from structural configurations (as is the <u>Poss</u> attached to an English NP that is a Det) is not represented.

D4b. Effective coconstituency of elements that are not actually coconstituents. These elements might happen to be adjacent to one another (as <u>the man</u> and <u>who</u> are in <u>the man who discovered Poughkeepsie</u>), but usually they are *discontinuous*. At least three dimensions of syntactic discontinuities seem to be important.

D4b1. Whether the discontinuities are short-range (whether the intervening material is specifiable as a finite sequence of constituent types), or whether they are long-range (whether the intervening material is a stretch that cannot be specified by a finite sequence of constituent types - that is, whether the discontinuity covers an 'essential variable').

D4b2. Whether the discontinuities are nested or crossing.

D4b3. Whether the discontinuity involves a single pair of elements, a multiple but bounded number of pairs, or an unbounded number of pairs

D5. Zeros are not represented. There are at least four subtypes. The names below are chosen with some desperation, since different writers use entirely different terms and symbols, or use the same terms and symbols in novel ways.

D5a. Gaps: a gap is a missing constituent corresponding to a *filler* constituent occurring elsewhere in the sentence; the sentence is interpreted as if the filler occurred in place of the gap. (Example: <u>Who do you think</u> Ø <u>murdered Cock Robin?</u>)

D5b. Zero anaphors: a zero anaphor is a missing constituent which must be understood as coreferential with some constituent occurring elsewhere in the sentence (or possibly beyond). (Example: <u>Helga knew</u> Ø <u>to go.</u>)

D5c. Elliptic zeros: an elliptic zero is a missing constituent which is neither a gap nor a zero anaphor; elliptic zeros are interpreted entirely from context. (Example: the subject and object ellipses in Ø <u>Finally finished</u> Ø <u>last week.</u>)

D5d. Absent words: an absent word stands in alternation (contrast or variation) with one or more present words. (Examples: the absent indefinite determiner in <u>penguins</u>, in contrast with the definite determiner <u>the</u> in <u>the penguins</u>; the absent complementizer in <u>I know penguins can't fly</u>, in variation with the complementizer <u>that</u>.)

D6. In order to state a variety of conditions on the occurrence of constituents in larger constructs ('horizontal' conditions, relating constituents within a construct; and 'vertical' conditions, relating a string of constituents to the context in which their construct occurs),

both lexical and phrasal categories must be atomized, broken into a number
of distinct categories. Thus, V is atomized into Vint, Vtr, Vdtr, etc.
when we state subcategorization restrictions; and S is atomized into Sroot
and Semb when we distinguish between constructions that occur only in root
sentences and those that occur only in embedded sentences. At least two
sorts of information are consequently not represented in constituent
structures specified by an adequate CF syntax:

D6a. The general lexical categories N, V, A, etc., and the general
phrasal categories NP, VP, S, etc. are not represented. Recall the
discussion of missing generalizations above.

D6b. Nothing corresponding to a general 'construction type' (e.g.,
topicalized sentence, regardless of which NP is topicalized, whether the
sentence is embedded or not, whether it is active or passive, etc.) is
represented.

D7. Harris' *transformational relatedness* is not represented.

D7a. No account is given of distinct, but systematically related,
structures that stand in a paraphrase relationship (e.g., the English
active and passive constructions).

D7b. Including the special case of alternative word orders, both of
coconstituents and of noncoconstituents.

D7c. Nor is any account given of systematic relationships between
structures where there is a corresponding relationship between the
semantic/pragmatic content of these structures (e.g., the English
declarative-interrogative distinction in sentence types).

D8. No differentiation is made between identical constituent
structures with different relationships among their parts. There are two
standard subtypes.

D8a. *Faux amis*: The structures are identical, but different classes
of lexical items occur in them (e.g., the celebrated easy/eager to please
cases).

D8b. Ambiguous sentences whose ambiguity can be traced neither to a
lexical ambiguity nor to an ambiguity in constituent structure (the
classical 'transformational' ambiguities): The structures are identical
down to lexical items.

D9. The relationship between interruptive material and its
surroundings is not adequately represented.

D9a. The structural (and phonological) separation of parenthetical
items (including, at least, whole-sentence parentheses, adverbial
parentheses, appositives, and vocatives) from surrounding material is not
represented.

D9b. Nor is the similar separation of expletives and (filled or unfilled) hesitations from surrounding material.

E. Other Components

The problems in articulating a CF syntax with other components of a grammar are apparently manifold. One sort of difficulty is loss of generalization, in particular loss of generalizations in other components directly following on loss of generalizations in syntax: If syntax doesn't make the generalizations or supply the pieces of information, then other components don't have them to refer to.

A distinct difficulty is that even well-supported systems of constituent structures (whether describable by a CFG or not) do not always provide the hierarchical structuring needed to state generalizations in other components. I begin with three cases of this sort, then turn to two situations where generalizations appear to cut across components. In the final set of cases, syntax hands on a loss of generalization to another component.

E1. Hierarchical structuring in syntax and in other components.

E1a. Phonology: Although in general the domains for phonological rules applying within, at the boundaries of, or between, phrases are those of syntactic constituent structure, there are not infrequent cases where phonological phrase domains differ from syntactic phrase divisions.

E1b. Semantics: Although in general principles of semantic interpretation can be stated as operating on the interpretations of coconstituents to yield an interpretation for the construct, there are not infrequent cases where this simple scheme of semantic composition seems to fail.

E1c. Lexicon: Although lexical items are normally single words, *idioms* are lexical items comprising a number of words, usually making a syntactic phrase. However, some idioms (like take umbrage at) involve a sequence of words that does not constitute a syntactic phrase.

E2. Generalizations across components.

E2a. Lexicon: The generalization about the lexicon appears to be that a lexical item can be either a word or a syntactic phrase.

E2b. Morphology: Although in general words can be treated as unanalyzed units in the statement of phrase structure rules, there are not infrequent cases where a morphological construction alternates with a syntactic construction, and others where a morphological construction is an obligatory concomitant of a syntactic construction, so that it appears that principles of alternation and cooccurrence must embrace both syntactic and morphological structure.

E3. Loss of generalization inherited by other components from syntax.

E3a. Lexicon/Morphology:

E3a1. Since lexical categories are atomized in PV syntax descriptions, different forms in the same inflectional paradigm belong to different categories, and there is no automatic relationship between them in the lexicon. <u>Horse</u> and <u>horses</u> end up belonging to different categories, and the existence of one has nothing to do with the existence of the other.

E3a2. Since PV syntax does not permit the expression of metarule relationships, it does not permit expression of the generalization that the lexical subcategories relevant in one set of rules can be identical to the lexical subcategories relevant in another. This relationship holds whenever rules introducing a lexical category are implicationally related to other rules introducing that lexical category.

E3b. Semantics: Since PV syntax does not permit the expression of metarule relationships, it does not permit expression of the generalization that when set A of rules is derivable by metarule from set B of rules, then the principles of semantic interpretation for A are also derivable from the principles of semantic interpretation for B.

E4. Loss of generalization in extragrammatical domains. Since 'construction types' are not represented in a PV syntax, there is nothing to associate stylistic, registral, discourse-structural, or other pragmatic markers with.

There are two distinct defects here. First, the atomization of syntactic categories makes it impossible to refer directly even to such abstract patterns as A + N (cited by Hudson 1980: 23 as a simple example of a syntactic construction that might figure as a 'linguistic item' referred to by a sociolinguistic statement). Instead, only a giant list of patterns is available.

Second, even if there were no atomization, we would still have no way of distinguishing faux amis or disentangling ambiguities that are neither lexical nor phrase-structural. An abstract pattern like V + AccNP + InfVP lumps together <u>believe him to be a spy</u> and <u>persuade him to be a spy</u>, despite the fact that these VPs differ in their stylistic and pragmatic properties as well as in their semantics. In transformational syntax the construction types are distinguished by virtue of the application of different transformations in their derivation, but the notion of construction type can be reconstructed in some non-transformational frameworks (as in GPSG, where a complete phrase structure rule includes a semantic interpretation principle as well as a list of mother and daughter categories) and is taken as a theoretical primitive in others (as in the Grammatical Construction Theory described by Lakoff 1984). But PV syntax has no place for such a notion.

F. Meta-Arguments

F1. One meta-argument against the adequacy of PV syntax notes that the typical example illustrating one presumed deficiency almost always illustrates several other presumed deficiencies; the phenomena are closely, complexly, linked with with one another.

The other side of this argument is that a good solution to one of the inadequacies solves many of the others as well — a fact that is usually viewed as an argument in favor of a syntax with a flavor other than plain vanilla.

But this particular sword cuts both ways. If the inadequacies of PV syntax are linked to one another, then supposing that an amendment to PV syntax solves one of the inadequacies (while preserving the mathematical character of the resultant system as CF) means that it will solve at least some others as well.

F2. A final meta-argument against PV syntax comes from *bootstrapping* — a situation in which assuming a transformational treatment of one phenomenon means that a transformational treatment of other phenomena is forced; Bach (1974: sec. 7.74) refers to these as 'arguments from other rules'. Again, the sword cuts both ways: if we don't have to assume the transformational analysis in one case, we are not obliged to assume such a treatment in the other.

4. Observations. How are we to respond to this catalogue of defects? In part, we have to question whether the defects are as claimed. Where they are, the response depends on the nature of the defect. Recall the discussion of responses to 'missing information' criticisms in part D of section 3 above. The defect might be linguistically irrelevant or syntactically irrelevant, in which case no alteration of PV syntax is called for.

Clearly, PV syntax must be amended in various ways to take account of the defects that are both genuine and relevant — but some of these amendments are more serious than others. A large part of the catalogue, in particular all the criticisms that follow from the atomization of categories, can be handled by giving up assumption B6 of section 2, 'Labels are unanalyzable wholes'. If assumption B1, 'The number of node labels is finite', is maintained, abandoning B6 is *innocuous*, in the sense that neither the describable stringsets nor the describable sets of constituent structures would be affected by such a change. On the other hand, if B6 is abandoned as well, say by permitting arbitrary integers to serve as indices within node labels, then the amendment is *substantial*, because the syntactic theory that results has all the power of unconstrained transformational syntax (despite looking like a simple variant of phrase structure syntax).[3]

Any one or more of the assumptions listed in section 2 might be abandoned or altered in an attempt to meet the case against PV syntax. In fact, for nearly every assumption — whether it concerns relations between nodes in trees, node labels, syntactic rules, the substantive content of

syntax, or the interfacing of syntax with other components of a grammar -
there is someone, somewhere or other in the literature on syntax, who has
proposed replacing that assumption. Some of these proposals have been
made repeatedly; for instance, node labels are analyzed into features in
almost all current theories, against assumption B6, and it is now standard
to posit some principles reorganizing the terminal structures of syntax so
as to provide the domains within which rules of sentence prosody and
phonology apply, against the assumptions of E5. Others have been put
forward only occasionally; most syntacticians assume the Single Mother
Condition (A2), the No-Tangling Condition (A3), the Acyclic Condition
(A4), the Unique Root Condition (A5), and the Total Ordering Condition
(A6), though each of these has been challenged at least once.

Each particular package of amendments makes an alternative theory of
syntax. Indeed, it is useful to view existing syntactic theories as such
packages of amendments to the basic model of PV syntax. Generalized
phrase structure grammar, for example, drops B6 (thus permitting the
analysis of node labels), C5 (thus separating the rules that specify
linear ordering from those licensing branchings), C8 (thus allowing zero
expansions for phrasal category symbols), C11 (thus admitting
generalizations over sets of rules), and E1h (thus allowing for lexical
redundancy rules), replaces C6 by an assumption that rules receive the
checking interpretation, and maintains the rule-to-rule semantics of
assumption E3c while allowing for the possibility that distinct rules
(with distinct semantic parts) can have identical syntactic parts.

In any individual instance it can be very difficult to decide just
how substantial a package of amendments is. The amendments of GPSG are
all innocuous, but assessing the effects of much greater deviations from
PV syntax is no easy task. It can also be very difficult to choose a
package that is worth pursuing, since the number of plausible combinations
of amendments is enormous, greater even than the figure of thirty million
that McCawley (1982) gives as an estimate of the number of viable
combinations of positions on the generative semantics vs. interpretive
semantics question.

NOTES

[1]Formal language theory, as summarized in works like Hopcroft and Ullman (1979).

[2]Serious efforts have been made, however, by Pullum and Gazdar (1982) and by Sampson (1983), and on the mathematical side by Perrault (1984).

[3]As my remarks in part A of section 3 suggest, there are also degrees of substance. corresponding to greater or lesser extensions of the set of CF languages.

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