

OBJECT ASYMMETRIES IN A PHASE THEORY OF SYNTAX¹

Martha McGinnis
University of Calgary

Some double object constructions, such as the Kichaga benefactive, allow the lower object to raise to the subject position (1) (Bresnan & Moshi 1990), while others, such as the English benefactive, do not (2).

- (1) a. K-èlyá k-ĩ-lyì-í-ò ìn-kà t.
7-food 7S-PRES-eat-APPL-PASS 1-wife
'The food is being eaten for the wife.'
b. M-kà n-ā-ĩ-lyì-í-ò t k-èlyā.
1-wife FOC-1S-PRES-eat-APPL-PASS 7-food
'The wife is having the food eaten for her.'
- (2) a. Alicia was baked *t* a cake.
b. *A cake was baked Alicia *t*.

Pylkkänen (2001) argues that there are two types of applicatives, which have different lexical semantics. I will show that this difference underlies the contrast between (1) and (2), and argue that the two applicatives have different syntactic 'phase' structures (Chomsky 1999, 2000). Phases are chunks of syntactic structure that are sent off to PF and LF for interpretation before the derivation continues. Thus, a difference in phase structure can give rise to syntactic, semantic, and phonological differences. As we will see, this prediction is confirmed.

1 Lexical semantics

A semantic contrast has long been observed between the English double object and prepositional dative constructions (Green 1974, Oehrle 1976, among others). The double-object applicative construction involves a directional/possessive relation between the two objects (3a), while the PP dative does not (3b).

- (3) a. *John ate Mary a cake.
b. John ate a cake for Mary.

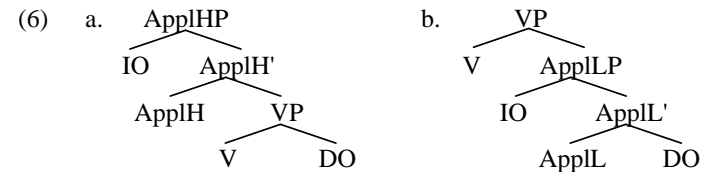
This directional/possessive restriction applies to benefactives in English (3) and Icelandic (4), but not in Kichaga (5a) and Albanian (5b).

- (4) a. Ólafur bakaði henni köku.
Olafur.NOM baked her.DAT cake.ACC
'Olafur baked her a cake.'

- b. *Höskuldur heldur henni töskunni.
Höskuldur.NOM hold her.DAT bag.ACC
'Höskuldur is holding her bag for her.' Ólafur Jónsson (p.c.)

- (5) a. N-ā-ĩ-lyì-í-ò ìn-kà k-élyā.
FOC-1S-PR-eat-APPL-FV 1-wife 7-food
'He is eating food for/on his wife.' Bresnan & Moshi (1990)
b. Agimi i mban Dritës çanten time.
A.NOM CL holds D.DAT bag.ACC my
'Agim holds my bag for Drita.'
(e.g., so that Drita can put something in it) Dalina Kallulli (p.c.)

Pylkkänen (2001) argues that cases like (5) involve a 'high' applicative, which denotes a relation between an event and an individual (6a), while cases like (4) involve a 'low' applicative, which denotes a relation between two individuals (6b). Thus the high ApplH takes a VP complement and a DP specifier, while the low ApplL takes a DP complement and a DP specifier.



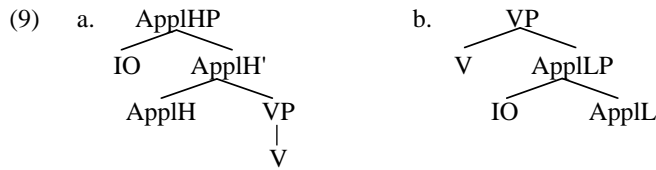
2 Transitivity

Pylkkänen argues that high applicatives can be used with agentive intransitives, while low applicatives cannot. Benefactives used with agentive intransitives are possible in Kinyarwanda (7a) and Albanian (7b), but not in English (8a) and Icelandic (8b).

- (7) a. Umugabo a-rá-som-er-a umugóre.
man SP-PRES-read-APPL-ASP woman
'The man is reading for the woman.' Kimenyi (1980)
b. Drita i pjek Agimit (rrepat).
Drita.NOM CL bake Agim.DAT turnips.ACC
'Drita bakes (turnips) for Agim.' Dalina Kallulli (p.c.)
- (8) a. Mary baked Alicia *(a cake).
b. Ólafur bakaði henni *(köku).
Olafur.NOM baked her.DAT cake.ACC
'Olafur baked her *(a cake).' Ólafur Jónsson (p.c.)

¹ Thanks go to Rose Letsholo, Alec Marantz, and Liina Pylkkänen for raising issues that led to this research. I am grateful to CLA audience members for their questions, and regret that space limitations prevent me from including the ongoing research they have generated.

This difference follows from the semantic/structural distinction made above. A high applicative can combine with any (event-denoting) VP, but a low applicative must combine with a DP complement and a DP specifier, since it denotes a relation between two individuals (9b).



The difference between (7) and (8) cannot be tied to the availability of dative morphological case, since both Albanian and Icelandic mark dative case on the applied object, while both Kinyarwanda and English lack a special dative case marking. At first glance, it might appear that the difference can be tied to the presence of an overt applicative affix. (7a) has the applicative suffix *-er*, while (7b) has a clitic *i* that appears obligatorily with dative arguments. We might suppose that the Albanian *i* is a light applicative verb, though in fact it is generally regarded as a pronominal clitic doubling the dative argument (Massey 1992, Kallulli 1999). By contrast, neither English nor Icelandic has an overt applicative morpheme. At first glance, therefore, it might appear that low applicatives lack an applicative morpheme. However, both the Kinyarwanda locative (10) and the Georgian benefactive (11) are low, but have an overt applicative morpheme: the suffix/enclitic *-ho* in Kinyarwanda, and the prefix *u-* in Georgian.²

- (10) Umuhuungu á-r-fig-ir-á-ho ishuûri *(imibáre).
 boy SP-PRES-study-ASP-LOC school mathematics
 'The boy is studying *(mathematics) at school.' Kimenyi (1980)

- (11) a. Nino-m vano-s surat-i da-u-xata.
 Nino-ERG vano-DAT picture-NOM PREV-BEN-draw.AOR
 'Nino drew a picture for Vano.'
 b. *Nino-m vano-s u-rbina.
 Nino-ERG vano-DAT BEN-run.AOR
 'Nino ran for Vano.' Léa Nash (p.c.)

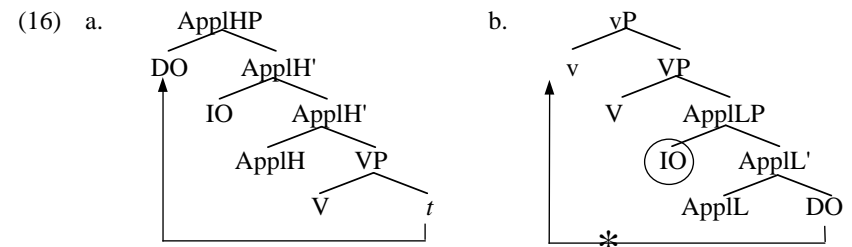
3 Movement to subject

Generally speaking, the lower object can raise to the subject position in a passive high applicative, as shown for Kichaga (12) and Albanian (13) benefactives, but not in a passive low applicative, as shown for English (14) and Icelandic (15) benefactives.

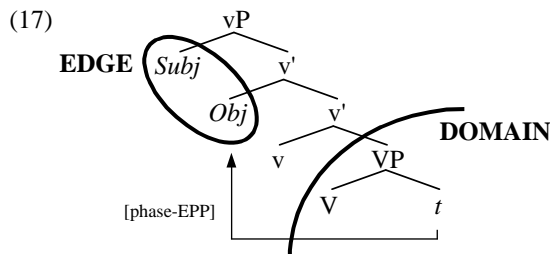
² The possibility remains that a high applicative must have either dative case or an overt applicative morpheme. However, the Kinyarwanda verb for *give* has no overt applicative morpheme, but still has the syntactic properties of the high benefactive applicative, which has an overt applicative morpheme (Kimenyi 1980, Woolford 1993).

- (12) a. K-èlyá k-ĩ-lyì-í-ò ìn-kà t.
 7-food 7S-PRES-eat-APPL-PASS 1-wife
 'The food is being eaten for the wife.'
 b. M-kà n-ǎ-ĩ-lyì-í-ò t k-èlyâ.
 1-wife FOC-1S-PRES-eat-APPL-PASS 7-food
 'The wife is having the food eaten for her.' Bresnan & Moshi (1990)
- (13) a. Secili libër iu kthye autorit të tij t.
 each book.NOM CL returned.NACT author.DAT its
 'Each book was returned to its author.' Massey (1992)
 b. Secilit djalë iu dha t paga i tij.
 each boy.DAT CL gave.NACT pay.NOM his
 'Each boy was given his pay.' Dalina Kallulli (p.c.)
- (14) a. Alicia was baked t a cake.
 b. *A cake was baked Alicia t.
- (15) a. Honum var gefin t bókin.
 him.DAT was given.NOM the book.NOM
 'He was given the book.'
 b. *Bókin var gefin honum t.
 the book.NOM was given.NOM him.DAT
 'The book was given to him.' Falk (1990)

This difference could be derived from the structural differences between ApplH and ApplL, if we can find independent evidence that ApplH has an 'escape hatch' specifier position for a lower argument, while ApplL does not:



What syntactic properties might underlie this difference? Chomsky (1999, 2000) proposes that syntax proceeds in *phases*, with the derivation sent off to PF and LF at each phase (for Chomsky, vP, CP, or DP). The head and *edge* of the phase are accessible to later syntactic operations, but the *domain* is not. Overt movement is driven by the need to check and uninterpretable EPP features on T or on a phase head before the end of the phase.



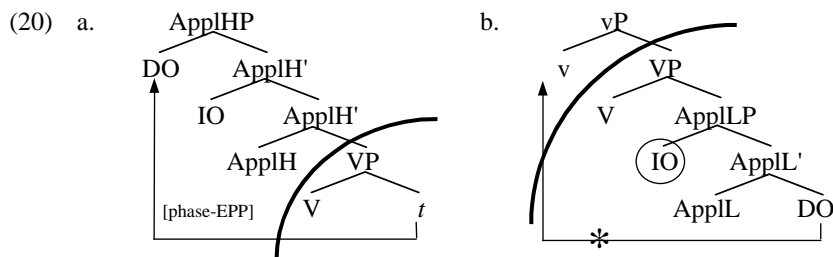
For example, in Icelandic object shift, the direct object can shift into a lower specifier of vP (18) (Bobaljik & Jonas 1996). The agent may remain in spec-vP if there is an expletive subject (18a), or raise to the subject position (18b). Jonas (1996) observes that the object can also shift above the subject (19).

- (18) a. það lauk [_{vP} einhver verkefninu] alveg [_{vP} t_j].
 there finished someone the.assignment completely
 'Someone finished the assignment completely.'

- b. Jólasveinarnir_i borðuðu [_{vP} t_i búðinginn_j] ekki [_{vP} t_j].
 the.Christmas.trolls ate the.pudding not
 'The Christmas Trolls did not eat the pudding.'

- (19) það lásu [_{vP} þessar bækur] aldrei neinir stúdentar [_{vP} t í fyrra].
 there read these books never any students last year
 'No students ever read these books last year.'

The differences in the availability of an escape hatch in high versus low applicatives would follow if ApplH heads a phase, but ApplL does not. A phase-EPP feature could then be added to ApplH, allowing the direct object to shift over the indirect object (20a), and onwards to the subject position. In a low applicative, the DO would have no way to move over the IO, so only the IO could raise to subject (20b).



Evidence for this distinction in phase structures can be found in the different phonological and semantic properties of high and low applicatives.

4 Phonological Phrasing

Seidl (2000) argues that in Bantu languages, phonological phrasing in benefactives is related to movement to subject position. In applicatives that have a symmetric passive—here, high applicatives—phonological phrasing generally groups the two objects together ([V IO DO]), while in those that have an asymmetric passive—here, low applicatives—the two objects are generally in separate phonological phrases ([V IO] [DO]). Seidl cites numerous examples, including those below:

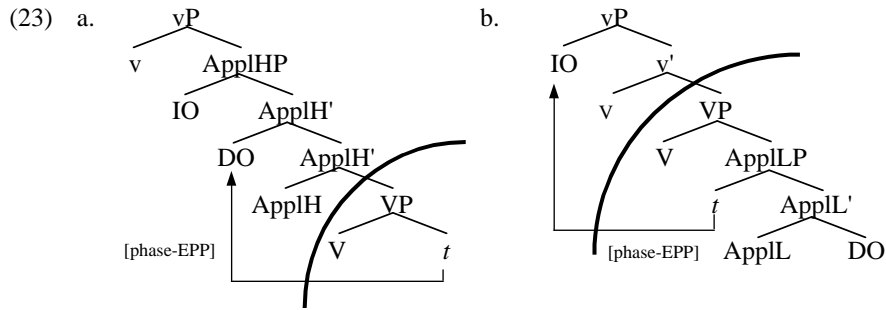
(21)

LANGUAGE	PASSIVE	PHONOLOGICAL PHRASING
Kikuyu	Symmetric	[V NP NP]
Kinyarwanda	Symmetric	[V NP NP]
Kinande	Symmetric	[V NP NP]
Haya	Symmetric	[V NP NP]
Xhosa	Symmetric	[V NP NP]
Chi-Mwi:ni:	Asymmetric	[V NP] [NP]
Kiswahili	Asymmetric	[V NP] [NP]

For example, Kinande benefactives have a symmetric passive. Here, the DO, but not the IO, is at the right edge of a phonological phrase, where vowel lengthening applies (22a) (Hyman & Valinande 1985). In Chi-Mwi:ni: benefactives, the passive is asymmetric. Here, the IO is at the right edge of a phonological phrase, where a vowel length shift applies (22b) (Kisseberth & Abasheikh 1974).

- (22) a. [Tu-ká-βi-túm-ir-a omúkali valinánde]. →
 Tu-ká-βi-túm-ir-a omúkali valinánde.
 we-PAST-T-send-APPL-FV woman Valinande
 'We have just sent Valinande to the woman.'
- b. [Ni-mw-andik-il-ile nuru:] [xatí]. →
 Ni-mw-andik-il-ile nuru xatí.
 SP-OP-write-APPL-FV Nuru letter
 'I wrote Nuru a letter.'

Seidl (2000) argues that the verb in these languages is outside the vP, in T. Assuming that high applicatives (23a) have symmetric passives, and low applicatives (23b) have asymmetric passives, the phonological facts follow if one object shifts out of VP, and the domain of a phase is a phonological phrase. In (23a), both the DO and the IO are outside the domain of the ApplHP phase, so the two are phrased together. In (23b), the IO is outside the domain of the phase, while the DO is inside the domain, so the two are phrased separately.



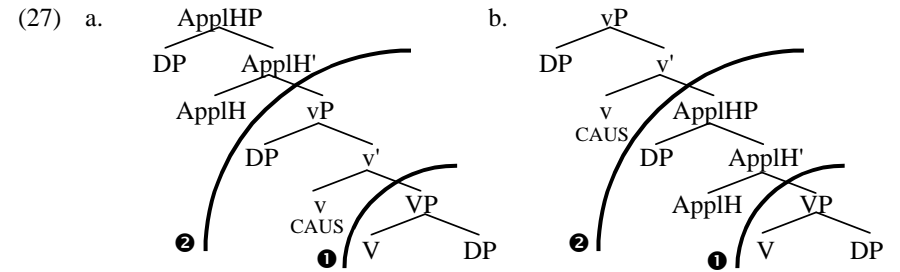
Evidence supporting Spell-Out at the phase level is that it allows an account of derivational effects in phonology without separate morphological derivations. For example, consider consonant mutation in Cibemba causatives (Hyman 1994, Orgun 1996). The superclosed vowel *-i-* in the causative suffix triggers (nonnasal) consonant mutation (24). In applicative constructions, the causative can trigger mutation on both the root and the applicative suffix (25). This is unexpected under representational approaches in which the derived form (*luf-is-i-*) is optimally identical to the base (*-lub-il-*).

- (24) -lub- 'be lost' -luf-i- 'lose'
 -fiit- 'be dark' -fiis-i- 'darken'
 -buuk- 'get up' -buus-i- 'get (someone) up'
- (25) -lub-il- 'be lost for/at' -luf-is-i- 'lose for/at'
 -fiit-il- 'be dark for/at' -fiis-is-i- 'darken for/at'
 -buuk-il- 'get up for/at' -buus-es-i- 'get (someone) up for/at'

As Hyman shows, the multiple mutation in (25) is not a spreading phenomenon: the causative does not trigger mutation on the base across other suffixes. Moreover, mutation on the base occurs only when the applicative takes scope over the causative (26a). When the causative takes scope over the applicative, there is no mutation (26b).

- (26) a. [[[ROOT] CAUS] APPL] → -luf-is-i- b. [[[ROOT] APPL] CAUS] → -lub-is-i-

These facts might suggest that consonant mutation applies after each step of a morphological derivation. However, a separate morphological derivation is suspect, given that the morphemes involved are syntactic heads that combine in the syntax. If Spell-Out occurs at each phase boundary, an account of multiple mutation need not have recourse to a separate morphological derivation. Suppose the input to the phonology is the domain of the phase just completed, added to the output of the phonology for the preceding phase domain. In (27a), the causative affix is added at the second phase, triggering mutation on the base. In the third phase the applicative affix infixes to maintain CV syllable structure, and mutates. In (27b), the causative affix is added at the third phase, so it triggers only one mutation. The phonological interpretations of (27a) and (27b) are given in (28).



(28)	(27a)			(27b)		
	Head	Input	Output	Head	Input	Output
Phase 1	V	-lub-	-lub-	V	-lub-	-lub-
Phase 2	v	-lub- + -i-	-luf-i-	ApplH	-lub- + -il-	-lub-il-
Phase 3	ApplH	-luf-i- + -il-	-luf-is-i-	v	-lub-il- + -i-	-lub-is-i-

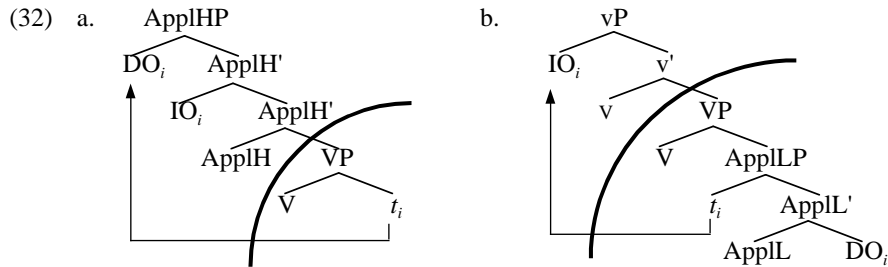
5 Binding

The higher object can bind the lower one in either a low or high applicative, as shown for the low English applicative in (29a) and the high Albanian applicative in (29b). When the higher object raises to subject of the passive, it can bind the lower one (30a), but when the lower object raises to subject position, it cannot bind the formerly higher one (30b).

- (29) a. The hairdresser_i showed Mary_j herself_{ij} in the mirror.
 b. Murati_i ia tregoi Dritës_j veten_{ij}.
 M.NOM CL showed D.DAT self.ACC
 'Murat_i showed Drita_j himself_i / herself_j.' Massey (1992)
- (30) a. Mary was shown *t* herself in the mirror.
 b. *Drita iu tregua vetes *t* (prej artistit).
 Drita.NOM CL show.NACT self.DAT by the.artist
 'Drita was shown to herself (by the artist).' Massey (1992)

The ill-formedness of (30b) provides additional evidence that ApplH heads a phase. Suppose that we account for the ill-formedness of this example as the result of an LF constraint on chain interpretation: a trace in the domain of a phase must be unambiguously bound (31). If the trace is coindexed with two phrases at the edge of a phase, as in (30b), it is ambiguously bound and the derivation crashes (32a). In (30a), the trace is unambiguously bound and the derivation converges (32b).

- (31) *Unambiguous Binding*
 α is the sole constituent in the phase edge that binds t_α .



Evidence that the constraint in (31) applies only to constituents at a phase edge comes from raising constructions in English. Here, the raised DP can bind the formerly higher experiencer (33a). The contrast between this example and (30b) can be accounted for if the PP experiencer in (33a) projects no phase boundary. If so, the raised DP and the experiencer never occupy the edge of the same phase, so no violation of Unambiguous Binding arises. Rizzi (1986) suggests that in fact (33a) is acceptable because *herself* does not c-command the trace of *Mary*, but (33b-c) suggest that this is not a possible account.

- (33) a. Mary_i seems to herself_i [_{*t*}_{*i*} to be too fond of Humphrey].
 b. *Mary seems to him_i [_{*t*}_{*i*} to be too fond of Humphrey_{*i*}].
 c. Mary seems to no one_i [_{*t*}_{*i*} to be too fond of him_{*i*}].

6 Unaccusatives

Low applicatives should allow only the higher argument of an unaccusative applicative to raise to the subject position, as in (perhaps) the English benefactive (34), while high applicatives should allow the lower argument to raise to subject, as in the Ikalanga benefactive unaccusative (35a), parallel to the passive (35b).

- (34) a. I got Mary a book.
 b. Mary got *t* a book.
 c. *A book got Mary *t*. *Baker (1996a)*
- (35) a. Vula i-no-bil-il-a she *t*.
 9.water 9.SA-PRES-boil-APPL-FV chief
 'The water is boiling for the chief.'
- b. Buka ya-ka-p-I-w-a Mary *t* ndi Neo.
 9.book 9.SA-PAST-give-APPL-PASS-FV Mary by Neo
 'The book was given to Mary by Neo.' *Letsholo (2001)*

Baker (1996b) proposes that suffixal applicatives are ("high") verbal applicatives which generally cannot combine with unaccusatives, and prefixal applicatives are ("low") prepositional applicatives which can. He cites examples of the former type from Mohawk (36a) and Sesotho (36b), and of the latter from Mayali (37a) and Ainu (37b).

- (36) a. *Sak wa-huwa-yá't-Λ'-s-e' ne owirá'a.
 Sak FACT-FsS/MsO-body-fall-BEN-PUNC NE baby
 'The baby fell on Sak.' *Baker (1996b)*
- b. *Letebele leo le-hol-el-e rona.
 Letebele that SP-grow-APPL-FV us
 'May that Letebele (clan name) grow up for us!' *Machobane (1989)*
- (37) a. A-kor kotan a-Ø-ε-sirepa.
 1sS-have village 1sS-3sO-APPL-arrive
 'I have arrived at my village.' *Evans (1991)*
- b. Sake a-Ø-ε-niste.
 wine 1sS-3sO-APPL-be.strong
 'I am strong in (drinking) wine.' *Shibatani (1990)*

As Baker notes, ditransitive unaccusatives like (36) are acceptable under certain circumstances. For example, if the theme is incorporated (38a) or inanimate (38b) in Mohawk, or cliticized in Sesotho (38c), the result is acceptable.

- (38) a. Sak wa-ho-wír-Λ'-s-e'.
 Sak FACT-FsS/MsO-baby-fall-BEN-PUNC
 'The baby fell on Sak.' *Baker (1996b)*
- b. Sak wa-hó-[a]hs-Λ'-s-e' ne ówise'.
 Sak FACT-MsO-thing-fall-BEN-PUNC NE glass
 'The glass fell on Sak.' *Baker (1996b)*
- c. Letebele leo le-re-hol-el-e
 Letebele that SP-us-grow-APPL-FV
 'May that Letebele (clan name) grow up for us!' *Machobane (1989)*

However, Letsholo (2001) shows that Baker's proposal fails: the suffixal Ikalanga benefactive can combine with unaccusatives without incorporation or cliticization of the theme, as shown in (35a). Moreover, Baker (1996a) suggests that the ill-formedness of (36) arises from deficient Case assignment in unaccusatives. However, identical restrictions on the Mohawk applicative arise when it combines with a transitive VP: the applicative is ill-formed if the theme is unincorporated (39a), but fine if it is incorporated (39b) or neuter (39c).

- (39) a. *Káskare Λ-hi-tsháry-a-'s-e'.
 friend FUT-1sA/MsO-find-Ø-BEN-PUNC
 'I will find him a girlfriend.'
- b. Λ-hi-skar-a-tsháry-a-'s-e'.
 FUT-1sA/MsO-friend-Ø-find-Ø-BEN-PUNC
 'I will find him a girlfriend.'

- c. Ká'sere' λ -hi-tsháry-a-'s-e'.
 car FUT-1sA/MsO-find-Ø-BEN-PUNC
 'I will find him a car.'

Baker (1996b)

Pylkkänen's high/low distinction is not a suffixal/prefixal distinction. Baker observes that both suffixal and prefixal applicatives can combine with unergatives, a characteristic of high applicatives. (40a) shows the suffixal Mohawk applicative with an unergative, while (40b) shows the prefixal Mayali applicative, reportedly also with an unergative.

- (40) a. λ -hi-yó'tá-hs-e'.
 FUT-1sS/MsO-work-BEN-PUNC
 'I will work for him.'

Deering & Delisle (1976)

- b. A-marne-yime-n.
 1sS/3sO-BEN-say-NONPAST
 'I will say to her.'

Evans (1991)

Like high applicatives, low applicatives are able to combine with unaccusatives. For example, the Finnish adversity *from*-applicative is a low applicative: it cannot combine with unergatives (41a) and requires a direct relation between the two arguments (41b). However, it can combine with unaccusatives (41c).

- (41) a. *Minu-lta juoksi lapsi. b. *Minu-lta satoi lunta.
 I-ABL ran child I-ABL fell snow
 'My child ran on me.' 'It snowed on me.'

- c. Minu-lta kuoli poika.
 I-ABL died son
 'My son died on me.'

Pylkkänen (2001)

7 Conclusions

The distinction between high and low applicatives, based on lexical semantics and argument structure, underlies a difference in movement to the subject position. A phase-based account of this relationship correctly predicts effects on phonology (phonological phrasing) and semantics (chain interpretation). Phase theory also suggests a way of attributing derivational phonological effects to the syntax, as in applicatives of causatives in Cibemba. The high/low distinction differs from Baker's (1996b) distinction between prefixal and suffixal applicatives, which is itself not borne out by benefactives in Ikalanga. Moreover, the account of suffixal applicatives in Baker (1996a) is not supported by the Mohawk data in Baker (1996b).

References

- Baker, Mark C. 1996a. Baker, Mark. 1996. On the structural positions of themes and goals. In J. Rooryck and L. Zaring (eds.), *Phrase Structure and the Lexicon*. Dordrecht: Kluwer.
- Baker, Mark C. 1996b. *The Polysynthesis Parameter*. New York: Oxford University Press.
- Bobaljik, Jonathan, and Diane Jonas. 1996. Subject positions and the roles of TP. *Linguistic Inquiry* 27, 195–236.
- Bresnan, Joan, & Lioba Moshi. 1990. Object asymmetries in comparative Bantu syntax. *Linguistic Inquiry* 21, 147–185.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In Roger Martin, David Michaels, & Juan Uriagereka (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1999. Derivation by phase. *MIT Occasional Papers in Linguistics* 18. Department of Linguistics, MIT.
- Deering, Nora, & Helga Delisle. 1976. *Mohawk: A teaching grammar*. Kahnawake: Thunderbird Press.
- Evans, Nicholas. 1991. *A draft grammar of Mayali*. Ms., University of Melbourne.
- Falk, Cecilia. 1990. On double object constructions. *Working Papers in Scandinavian Syntax* 46, 53–100. Department of Scandinavian Linguistics, Lund University.
- Green, Georgia M. 1974. *Semantics and syntactic regularity*. Bloomington: Indiana U. Press.
- Hyman, Larry. 1994. Cyclic morphology and phonology in Cibemba. In Jennifer Cole & Charles W. Kisseberth (eds.), *Perspectives in phonology*. Stanford: CSLI Publications.
- Hyman, Larry, & N. Valinande. 1985. Globality in the Kinande tone system. In D. Goyvaerts (ed.), *African Linguistics: Essays in memory of M. W. K. Semikenke*. Amsterdam: Benjamins.
- Jonas, Dianne. 1996. Clause structure and verb syntax in Scandinavian and English. Doctoral dissertation, Harvard University.
- Kallulli, Dalina. 1999. The comparative syntax of Albanian: On the contribution of syntactic types to propositional interpretation. Doctoral dissertation, University of Durham.
- Kimenyi, Alexandre. 1980. *A Relational Grammar of Kinyarwanda*. Berkeley: University of California Press.
- Kisseberth, Charles W., & Mohammad Imam Abasheikh. 1974. Vowel length in Chi-Mwi:ni:—a case study of the role of grammar in phonology. In M. W. la Galy, R. A. Fox, and A. Bruck (eds.), *Papers from the parasession on Natural Phonology*. Chicago Linguistic Society.
- Letsholo, Rose. 2001. On the (universal, non-?) existence of unaccusative applicatives: The case of Ikalanga. Paper presented at the MIT Appl-Fest Workshop, January 27–28.
- Machobane, 'Malillo. Some restrictions on the Sesotho transitivizing morphemes. Doctoral dissertation, McGill University.
- Massey, Victoria Walker. 1992. Compositionality and constituency in Albanian. Doctoral dissertation, University of North Carolina, Chapel Hill. *MIT Occasional Papers in Linguistics* 3. Department of Linguistics and Philosophy, MIT.
- Oehrle, Richard. 1976. The grammatical status of the English dative alternation. Doctoral dissertation, MIT. Distributed by MIT Working Papers in Linguistics.
- Orgun, Cemil Orhan. 1996. Sign-based morphology: A declarative theory of phonology-morphology interleaving. In Ben Hermans & Marc van Oostendorp (eds.), *The derivational residue in phonological Optimality Theory*. Amsterdam: Benjamins, 1999.
- Pylkkänen, Liina. 2001. What applicative heads apply to. In M. Fox, A. Williams & E. Kaiser (eds.), *Proceedings of the 24th Annual Penn Linguistics Colloquium*. Penn Working Papers in Linguistics, 7.1. Department of Linguistics, University of Pennsylvania.
- Rizzi, Luigi. 1986. On chain formation. In Hagit Borer (ed.), *The syntax of pronominal clitics: Syntax and Semantics* 19. New York: Academic Press.
- Seidl, Amanda. 2000. Minimal Indirect Reference: A theory of the syntax-phonology interface. Doctoral dissertation, University of Pennsylvania.
- Shibatani, Masayoshi. 1990. *The languages of Japan*. Cambridge: Cambridge University Press.
- Woolford, Ellen. 1993. Symmetric and asymmetric passives. *Natural Language and Linguistic Theory* 11, 679–728.