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Metrical Coherence in Old English without the Germanic Foot

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Dresher and Lahiri (1991)—hereafter DL—show that stress and high vowel deletion in Old English as well as a number of other phonological phenomena crucially involve the metrical structure of the word. They formulate this important insight in terms of the metrical framework of Hayes (1980) as modified by Hammond (1984, 1986), McCarthy and Prince (1986), and Hayes (1987) and conclude that in order to capture the regularities they have observed, this theory of metrical structure must be further enriched by the introduction of a new entity, the Germanic foot. The Germanic foot is left-headed and its head "contains at least two moras" (p. 255), whereas its nonhead may contain only a single light syllable. DL illustrate the Germanic foot with the examples in (1) (see their (8)–(10)). To economize space, we transcribe their examples by enclosing the material that makes up the subconstituents of the Germanic foot in square brackets, and the Germanic foot itself in angled brackets.

We are grateful to Elan Dresher for helpful comments on an earlier version of this reply. Needless to say, Dresher's help is not to be construed as endorsement of any of the views expressed here.

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(1) ⟨[goo][du]⟩ ⟨[hea][fu]⟩⟨[des]⟩
⟨[wor][du]⟩ ⟨[weru][du]⟩
⟨[lofu]⟩ ⟨[lofum]⟩
⟨[cynin][ga]⟩ ⟨[færel][du]⟩

DL utilize the Germanic foot to state the Old English High Vowel Deletion (HVD) as a process that deletes a high vowel in the weak (right) branch of the Germanic foot. Thus, in the examples in (1) syllables ending in /u/ are subject to HVD, except for the final syllable of *lofu* since this syllable is part of the strong (head) part of the foot.

DL then show that supplemented with a small amount of machinery, the Germanic foot also allows them to account straightforwardly for the distribution of stresses in Old English words as well as for resolution in Old English alliterating meter. In a separate section they show how the Germanic foot can be used in an account of Sievers's Law in Gothic.

Since the Germanic foot is a structure that differs radically from the trochaic and iambic feet postulated in other versions of the Hayes-Hammond theory of stress, DL are concerned that the introduction of the Germanic foot might increase beyond necessity the expressive power of the theory that they have adopted. They argue, however, that this enrichment is required by the facts; and they attempt to demonstrate that the stress theory proposed by Halle and Vergnaud (1987; hereafter HV), which differs from the Hayes-Hammond theory in important ways, can deal with the data only at the cost of introducing a number of undesirable complications.

The main purpose of this reply is to show that DL's demonstration does not go through because it is based on an unjustified assumption about how the HV theory is to be applied.

According to DL, an account of the Germanic data in the HV framework would require (2) (their (39a)).

(2) Stressable elements are the head vowels of syllables.

The HV theory does not force this solution. It allows as an alternative that in addition to syllable heads the immediately following rime segment may also be treated as stressable. Formally, this means that within the HV theory (2) can be replaced by (3).

(3) Stressable elements are the head vowels of syllables *and the immediately following rime segment, if any.*

The possibility that rime elements other than syllable heads are metrically relevant and/or stress-bearing is admitted in all theories. In fact, it is noted by DL (see fn. 17) that in this respect Old English resembles Cairene Arabic, a language that was analyzed by HV (pp. 62–63) as subject to (3) rather than (2). In view of this, it is surprising that DL postulated (2) in place of the correct (3).

Elan Dresher has told us that the choice of (2) over (3) was due to DL's desire to choose the representation "which recreates most closely our [= DL's] analysis of the

basic foot structure. In our analysis, a sequence (H L) represents one foot, an effect that can be obtained in the H&V framework by assigning line 0 asterisks only to head vowels . . .'' (letter to M. Halle, June 28, 1991). However, since DL's Germanic foot has no special status in the HV framework, there is no reason to consider only a solution that recreates this aspect of DL's account. By limiting their exploration of the HV framework in this fashion, DL have arbitrarily excluded from consideration a solution available within the HV framework and have failed to provide a fair test for the framework.

In what follows we sketch the solution offered by the HV framework to the data discussed by DL if (2) is replaced by (3). As detailed below, when correctly applied, the HV metrical theory accounts for all the facts discussed by DL without introducing new theoretical entities or other modifications. The data adduced by DL thus must be viewed as evidence supporting the HV theory over the Hayes-Hammond alternative embraced by DL, for only the former theory can handle these data without increase in descriptive power.

Once (3) is adopted, some of the Old English forms discussed by DL are analyzed as having the stressable elements shown in (4).

(4)

wordu	niitenu	ooþerne	werudu	cyninges	æþelinges	
** *	** * *	** ** *	* * *	* ** **	* * ** **	line 0

We now follow DL's procedure and assign (pursuant to their (39b)) ''a line 1 asterisk to the head of syllables with long vowels and closed syllables,'' as in (5).[1]

(5)

wordu	niitenu	ooþerne	werudu	cyninges	æþelinges	
** *	** * *	** ** *	* * *	* ** **	* * ** **	line 0
*	*	* *		* *	* *	line 1

In the next step, following DL's (39c), we construct binary left-headed constituents from left to right on line 0 and mark constituent heads on line 1, as in (6).

(6)

wordu	niitenu	ooþerne	werudu	cyninges	æþelinges	
(**(*	(**(* *	(**(**(*	(* *(*	(*(**(**	(* *(**(**	line 0
* *	* *	* * *	* *	* * *	* * *	line 1

Following DL's (39g–h), we then construct left-headed unbounded constituents on line 1 and mark their heads on line 2, as in (7).

(7)

wordu	niit enu	ooþerne	werudu	cyninges	æþelinges	
(**(*	(**(* *	(**(**(*	(* *(*	(*(**(**	(* *(**(**	line 0
(* *	(* *	(* * *	(* *	(* * *	(* * *	line 1
*	*	*	*	*	*	line 2

[1] In view of the proposals in Halle 1990 we should now utilize instead of DL's (39b) a rule that interprets the left boundary of a syllable as a foot boundary. Since (except for the cases discussed in (15)–(18)) this is a distinction without a difference, we do not make a special point about it in our discussion.

This procedure correctly places main stress on the initial syllable in all cases. It also provides the structure from which HVD and the surface stress contours can readily be derived.

The condition for HVD on the account proposed here is that given in (8). This rule is our counterpart of DL's rule (7).

(8) Delete a high vowel in a noninitial syllable if it constitutes a nonbranching foot (light syllable).

As a consequence of HVD (8), word-final /u/ is deleted in *wordu, werudu,* but the final /u/ in *niitenu* is preserved since it does not constitute a nonbranching foot.

There are a number of well-known exceptions to HVD in the text of the Vespasian Psalter that were discussed by Dresher (1978) as well as by Keyser and O'Neil (1985). We examine here the set of exceptions discussed by Keyser and O'Neil (p. 136). In (9) we give the underlying forms on the left and the correct outputs on the right.

(9) a. haalige > haalge
b. haaligum > haalgum
c. haaligne > haaligne
d. heafude > heafde
e. heafudum > heafdum
f. monige > monge
g. monigum > mongum
h. monigra > monigra

We begin with (9a–c). Proceeding with the rules developed to this point, we obtain the metrical structures in (10).

(10) a. haalige
(**(* *
(* *
*

b. haaligum
(**(*(**
(* * *
*

c. haaligne
(**(* *(*
(* * *
*

The only form to which HVD (8) would apply is (10b), where this would yield the correct output. Following Keyser and O'Neil (p. 137), we assume that word-medially obstruent + liquid sequences such as those in (10c) are not subject to onset maximization; that is, the word is syllabified *haa.lig.ne,* not *haa.li.gne*. As a result, /i/ is not subject to HVD (8) and the correct output is generated.

To derive the correct output for (10a), we postulate that the case ending /e/ is non-stress-bearing; that is, it fails to project an asterisk on line 0 (see Halle 1990). This is illustrated in (11).[2]

[2] The suffix /e/ is not the only Old English affix that is non-stress-bearing. We suggest below that the same is true of the suffix /u/ in certain environments. Moreover, the prefix *ge* is systematically incapable of bearing stress and is therefore never projected on line 0 of the grid. The prefix *bi* apparently vacillates as to whether or not it is stressable (see Dresher 1978:148).

(11) haalige
(**(*

As a result, /i/ constitutes a nonbranching foot and is subject to HVD (8).

We next examine the forms in (9d–e). These will receive the metrical structures shown in (12).

(12) a. heafude
(**(*
(* *
*

b. heafudum
(**(*(* *
(* * *
*

We have assumed that, as proposed above, the case ending /e/ in (12a) is non-stress-bearing. As a result, the /u/ in (12a) constitutes a nonbranching foot and is subject to deletion by HVD (8). In (12b) the word-medial /u/ is in a nonbranching foot and is therefore deleted by HVD (8).

This brings us to the forms in (13a–c).

(13) a. monige
(* *
(*
*

b. monigum
(* *(* *
(* *
*

c. monigra
(*(**(*
(* * *
*

To deal with these forms, we follow the lead of Keyser and O'Neil and ask how the representations in (13) need to be modified so that HVD (8) will apply correctly. The answer is that in these words the word-initial syllable—though nonbranching—must constitute a foot. We implement this not by postulating with Keyser and O'Neil that the initial syllable is lengthened, but rather by postulating that in these words the first syllable idiosyncratically constitutes a foot by itself. Thus, instead of (13) we obtain the metrical structures in (14).

(14) a. monige
(*(*
(* *
*

b. monigum
(*(*(* *
(* * *
*

c. monig ra
(*(**(*
(* * *
*

HVD (8) will then delete the high vowel in (14a) and (14b) but not in (14c).

The last set of examples to be examined consists of nouns ending with the inflectional suffix /u/. The treatment of this suffix in the Vespasian Psalter is the major topic of chapter III of Dresher 1978. Dresher notes that there are three types of cases that must be considered. In one large class of forms the /u/ suffix is systematically preserved after heavy monosyllabic stems (see (15a)). In a second set of forms the /u/ suffix is systematically deleted after heavy monosyllabic stems (see (15b)). In a third set of forms, all of which have polysyllabic stems, the /u/ suffix is sporadically deleted (see (15c)).

(15) a. leng-u 'length'
birht-u 'brightness'
hæl-u 'health'

Pl N/A
riic-u 'dominion'
wiit-u 'punishment'
fiðr-u 'wing'

b. Pl N/A
cild 'child'
huus 'house'
word 'word'

c. Pl N/A
heafud-u/heafud 'head'
haalig-u/haalig 'holy'
monig-u/monig 'many'

Dresher (1978) presents evidence that the nouns in (15a) have the underlying representations in (16a), in which the high vowel /i/ intervenes between the stem and the suffix /u/. These forms parallel those in (15c) in that they end in a bisyllabic foot. They differ in this from the forms in (15b), which end in a nonbranching foot. We illustrate this in (16b–c).

(16) a.	leng-i-u	riic-i-u	wiit-i-u
	(** (**	(** (**	(** (**
b.	cild-u	huus-u	word-u
	(** (*	(** (*	(** (*
c.	heafud-u	haalig-u	monig-u
	(**(* *	(**(* *	(*(* *

Given the representations in (16a–c), HVD (8) will delete the word-final /u/ in (16b) but leave the forms in (16a,c) intact. We now observe that the forms in (16a) and (16c) not only end in a branching foot in their underlying representations; they also share the fact that one of the two syllables of the binary foot is deleted. HVD (8) cannot apply here since it applies only to a high vowel that constitutes a nonbranching foot. Hence, if we want HVD (8) to apply in the last foot of these words, we must transform it into a nonbranching foot. We achieve this by postulating that one of the two vowels in the foot becomes non-stress-bearing. In the majority of instances it is the case suffix /u/ that becomes non-stress-bearing; that is, in this environment it mimics the behavior of the suffix /e/ encountered in (9). We illustrate this in (17a–b).

(17) a.	leng-i-u	riic-i-u	wiit-i-u
	(** (*	(** (*	(**(*
b.	heafud-u	haalig-u	monig-u
	(**(*	(**(*	(*(*

Observe that in all cases above the case suffix is not subject to HVD (8); it is the presuffixal vowel that is so affected. To account for the fact that the forms in (17b) have alternants in which the case ending rather than the presuffixal vowel is deleted, we assume that in the latter instance the presuffixal vowel becomes non-stress-bearing. We illustrate this in (18).

(18)	heafud-u	haalig-u	monig-u
	(** (*	(** (*	(* (*

As a result, the case suffix /u/ undergoes HVD (8).

The facts of Old English HVD thus present no special problems for the HV theory. As shown above, exceptional forms are treated by minor modifications in representations rather than by recourse to special feet or to other theoretical devices not attested elsewhere. These facts thus provide no justification for DL's conclusion that the HV framework can deal with the Old English data only at the cost of introducing a number of undesirable complications.

Turning next to the treatment of secondary stresses, which for DL require recourse to the Germanic foot, we postulate the two rules in (19).

(19) a. Delete line 1 asterisk (stress) from word-internal syllables if they are light or word-final.

b. Delete line 2 asterisk from a heavy syllable after a nonbranching (i.e., light syllable) foot.

These rules, which are the counterparts of the rules discussed by DL in their section 2.2, must apply after HVD (8), because stress deletion automatically causes defooting. If the rules in (19) applied before HVD (8), the input to HVD (8) would contain forms such as those in (20), to which it cannot apply. This incorrect outcome is avoided by ordering HVD (8) before (19).

(20)	niiten-u	word-u
	(**(*	(**

Once again the HV framework handles the data straightforwardly without being forced to introduce undesirable complications.

The third instance where DL claim that the Germanic foot plays a crucial role is the rule of Resolution in Old English meter. It must be noted at the outset that the feet determining the well-formedness of lines in poetry are not necessarily identical with the

feet constructed by the stress rules. For example, the stress rules as stated above take no account of the foot structure of adjoining words, but this fact is of course crucial to the computation of metrically well formed lines in poetry. However, there are significant parallels between the two kinds of feet, so that DL are unquestionably correct in including poetic meter as data on which to test the validity of their—or any other—theory of metrical structure.

Specifically, in determining the well-formedness of a line in the Old English alliterating verse, rule (21), a modified form of rule (3), is applied to determine the metrically relevant units, and the half-line is treated as though it were one word.

(21) Metrically relevant are the head vowels of syllables and the immediately following rime segment, if any; except that in a heavy syllable at the end of a half-line it is optional whether or not the rime-final segment is counted as metrically relevant.

DL's rule (39b) or its equivalent then foots all heavy syllables. Finally, binary foot structure is imposed from left to right on all remaining metrically relevant segments.

We illustrate in (22) how this procedure affects the three examples given by DL (their (19a–c)) and an additional example constructed by us.

(22) a. sinc-faage sel
(** (**(* (**
* * * *

b. þriist-hyydig þioden
(** (**(** (**(**
* * * * *

c. heal-þegnes hete
(** (**(** (* *
* * * *

d. heal-þegnes hetes
(** (**(** (* *
* * * *

Examples (22a,c,d) are well formed; (22b) is not. It is readily seen that the well-formed examples are composed of four feet each, whereas the ill-formed (22b) has five feet. The optional treatment of the last rime in the half-line is seen by comparing (22a) with (22d), both of which end with a phonetically heavy syllable. This syllable is treated as having two metrically relevant positions in (22a), but as having only one such position in (22d). It is to be noted that this dual treatment does not render (22b) metrical.

In many metrical traditions the quantity of a verse-final syllable is subject to different principles from those governing a verse-medial syllable. Thus, for instance, in the dactylic hexameters of Homer the verse-final rime is counted as heavy even if it consists of a short vowel. This is strikingly illustrated by the first line of the *Odyssey* quoted in (23), which ends with a foot composed of a phonetically heavy syllable followed by one that is light. Since such feet are otherwise inadmissible, it is necessary to assume that in Homeric verse, verse-final rimes are treated differently from other rimes.

(23) āndră mŏi ēnnĕpĕ, Mo͞usă, pŏlūtrŏpŏn, hōs mălă pōllā

Thus, the evidence adduced by DL from poetic meters can readily be accounted for by the HV theory without recourse to otherwise unattested feet or procedures.

This brings us to Sievers's Law in Gothic. DL describe this phenomenon, which is limited to certain morphological classes, as follows: "According to Sievers's Law, [i] occurs after a heavy syllable or a sequence of syllables, whereas [j] occurs after a light syllable" (p. 264). This statement is somewhat inaccurate: [j] does not occur after light syllables everywhere, but only if the light syllable has main stress (i.e., is word-initial). (See Seebold 1972:23, 64–78.)

We assume in agreement with one of the two versions discussed by DL that the phenomenon of interest consists of vocalizing the /j/ in a /Cj/ syllable onset and transforming the onset into a separate C*i* syllable. The vocalization happens everywhere except after word-initial short syllables, as illustrated in (24) with examples cited by DL (their (22a–c)).

(24) a. miki.ljis > miki.liis 'glorify'
sipoo.njis > sipoo.niis 'be a disciple'
glitmu.njis > glitmu.niis 'glitter'
b. soo.kjis > soo.kiis 'seek'
nam.njis > nam.niis 'name'
na.sjis 'save'
a.rjis 'plow'
c. stoo.jis 'judge'

As the data in (24a) show, if the C*j* cluster begins the third syllable, vocalization takes place without regard to the nature of the preceding syllable. By contrast, as shown in (24b), if the C*j* onset begins the second syllable, vocalization takes place if the word-initial syllable is heavy, but not if it is light.

In the HV framework these facts are captured by rule (25).

(25) The syllable onset C*j* is syllabified C*i* if preceded—directly or indirectly—by a branching foot.

We illustrate this in (26) with some of DL's examples from (24), showing the metrical structure assigned to the words before Vocalization applies.

(26)

miki.ljis	glitmu.njis	soo.kjis	na.sjis	stoo.jis
(* * (**	(** (* (**	(** (**	(* (**	(**(**

In the first three examples in (26) the C*j* onset is preceded—directly or indirectly—by a branching foot, and Vocalization will therefore apply. Vocalization does not apply to the last two examples in (26), but for two different reasons. It does not apply to *nasjis* because the C*j* onset is preceded by a nonbranching foot. It does not affect *stoojis* in (24c) because the word lacks a C*j* onset altogether.

To sum up, we have shown that once DL's arbitrarily imposed condition (2) (= their (39a)) is replaced by (3), all the facts they adduce can be accounted for straightforwardly without any modification in the HV framework. As DL show, in the competing Hayes-Hammond framework the same facts can be treated only at the cost of introducing the Germanic foot, an otherwise unknown foot type of unprecedented structure. Since no modifications are required for an account of these data in the HV framework, we submit that pace DL the data provide evidence for the HV framework as against that of Hayes-Hammond.

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Remarks on Weak Crossover Effects

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1 Background

Lasnik and Stowell (1991) (hereafter: LS) make important suggestions about the factors determining the *weak crossover* (hereafter: WCO) effect. According to LS, a widely accepted descriptive generalization concerning this effect is (1) (= LS's (14)).

(1) In a configuration where a pronoun P and a trace T are both bound by a quantifier Q, T must c-command P.

LS make two major points. The first is factual. They claim both that (1) is too general and that a correct limitation has to do with the character of the extracted phrase. They come to essentially the following conclusion:

(2) The WCO effect arises only when the *Q* of (1) represents semantically a "true quantifier phrase."

This generalization is based on a distinction between two classes of extractions. In one type, including those in questions and restrictive relatives, LS's data show that the WCO effect appears.[1] In the other, including topicalization, object raising, parasitic gap extractions, and nonrestrictive relatives, their data indicate that the WCO effect is absent.[2]

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[1] I agree strongly with LS (pp. 698, 706), Safir (1984:608, n. 7, 1985:288, 1986:667), Higginbotham (1980: 702), and Cinque (1990:155), contra Chomsky (1982:93), that WCO effects are found in English restrictive relatives. As Safir (1984:608, n. 7) observes, Chomsky (1976:(100)–(101)) also seemed to accept the ungrammaticality assumed here. Note that Postal (1971:165, (17.(5)d), 166, (17.(7)d), 1973:103, (3a), 108, (9)–(10)) systematically marked restrictive relatives as manifesting WCO effects.

[2] The observation that English nonrestrictive relatives fail to yield WCO effects was made earlier by Safir (1984:608, 1985:288, 1986:667) and Kuno (1988:241). Contrary but I now think mistaken judgments occur in

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