

# GERMAN VERBAL PREFIXATION KNOWS NO BOUND(ARIE)S

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The purpose of this paper is to characterize the internal morphological structure of German inseparably and separably prefixed verbs, exemplified in (1)a and (1)b, respectively:

- (1)a. Er versteht es.  
'He understands it.'
- b. Er steht fr<sup>h</sup> auf.  
'He gets up early.'

To this end, I will examine four rules which must refer to this structure (Finite Verb Placement, Participle Formation, Zu-Infinitive Formation, Stress Assignment) and I will show that these rules may be formulated more simply and straightforwardly if the verb's structure is characterized hierarchically (via the notions stem, root, and word, as used by Selkirk (1978)) rather than linearly (via boundaries).

1.0. The data. The following sentences exemplify the various configurations which define the inseparable prefixation pattern (the (a) sentences) and the separable prefixation pattern (the (b) sentences). The (c) sentences show the independent verb stehen for comparison.

- (2) Present and simple past tenses, main clause word order.
  - a. Er versteht (verst<sup>nd</sup>) es.  
'He understands (understood) it.'
  - b. Er steht (stnd) fr<sup>h</sup> auf.  
'He gets (got) up early.'
  - c. Er steht (stnd) in der Ecke.  
'He stands (stood) in the corner.'

(3) Perfect tense (auxiliary plus participle).

- a. Er hat es verst<sup>nd</sup>en.  
'He understood it.'
- b. Er ist fr<sup>h</sup> aufgest<sup>nd</sup>en.  
'He got up early.'
- c. Er hat in der Ecke gestanden.  
'He stood in the corner.'

(4) Zu-infinitive (sentential complement of certain verbs).

- a. Er versuchte, es zu verstehen.  
'He tried to understand it.'
- b. Er versuchte, fr<sup>h</sup> aufzuste<sup>hen</sup>.  
'He tried to get up early.'
- c. Er versuchte, auf dem Kopf zu stehen.  
'He tried to stand on his head.'

(5) Present and simple past tenses, subordinate clause word order.

a. Er sagte, dass er es verstand.  
'He said that he understood it.'

b. Er sagte, dass er früh aufstand.  
'He said that he got up early.'

c. Er sagte, dass er in der Ecke stand.  
'He said that he stood in the corner.'

(6) Infinitive in future and modal constructions (no zu).

a. Er wird (soll) es verstehen.  
'He will (should) understand it.'

b. Er wird (soll) früh aufstehen.  
'He will (should) get up early.'

c. Er wird (soll) in der Ecke stehen.  
'He will (should) stand in the corner.'

(7) Gerund and present participle.

a. Das Verstehen - der verstehende Mann  
'understanding' - 'the understanding man'

b. Das Aufstehen - der früh aufstehende Mann  
'getting up' - 'the man who gets up early'

c. Das Stehen - der stehende Mann  
'standing' - 'the standing man'

(8) Citation form

- a. verstehen
- b. aufstehen or stehen auf
- c. stehen

1.1 The inseparable verbs. Comparing the (a) sentences to the (c) sentences, we see that the verb verstehen may be analyzed into a base verb stehen (the term 'base' is from Aronoff (1976)), plus a prefix ver-. The past tense and participial morphology of the base verb in verstehen is identical to that of the independent verb stehen, even though any semantic relationship has vanished. Note that in all environments, the prefix remains unstressed and is phonologically bound to the base verb; note also that there is no ge- prefix on the participle. I shall refer to verbs like verstehen as inseparable verbs or inseparable combinations of prefix and base.

1.2 The separable verbs. Comparing the (b) and (c) sentences in (5)-(7), it is clear that aufstehen may also be analyzed into a base verb stehen, which bears the past tense and participial morphology as well as an extended meaning of independent stehen, plus a prefix auf, which is homophonous to, if not the same as, the preposition auf 'up'. Since the prefix is not always phonologically attached to the base verb ((2)-(4)), I shall follow Duden Grammatik in calling it an affix, distinguishing it, for purposes of exposition, from the prefix in the inseparable pattern. I shall refer to verbs like aufstehen as separable verbs or separable combinations of affix and base.



1.2.1. Affix and base verb appear in three configurations relative to each other in separable combinations:

i. In (2)b, when the base is conjugated and the sentence has main clause word order, affix and base are phonologically independent words; each bears main stress, and they are separated by indefinitely long stretches of sentence. (In main clause word order, conjugated verbs appear in second position, after the subject, while the rest of the verb complex--participles, infinitives and affixes--take clause-final position.)

ii. In (3)b and (4)b, affix and base verb are separated by the participial prefix ge- and the usually cliticized infinitival complement marker zu; aufgestanden and aufzustehen may be considered single words phonologically, for the affix bears main stress and the base has 3-stress.

iii. In (5)b-(7)b, affix and base form a single phonological unit with no intervening material. (5)b shows the base verb conjugated in subordinate clause word order, where the conjugated verb is placed clause-finally; (6)b shows the verb in the non-zu infinitive; (7) shows the gerund and present participle, which can be derived from the infinitive.

In separable combinations, then, the affix always bears 1-stress, while the base bears 3-stress when the two form a single word.

1.2.2. Upon consideration of the phonological discontinuity of affix and base in (2)b, it is reasonable to question my tacit assumption that affix and base do indeed comprise a single lexical unit. That they do is supported by the following:

i. Semantically, affix and base combinations are not always transparent, hence not always analyzable into discrete units of meaning which correspond to discrete units of form. For example, anfangen 'to begin' (an 'contiguous, at', fangen 'to catch') and umbringen 'to kill' (um 'around', bringen 'to bring') are fairly opaque. The affix-base combination often acquires an extended meaning, as in aufstehen 'to get up out of bed', 'to revolt, start a revolution' (auf 'up', stehen 'to stand') or a specialized meaning, as in durchkommen 'to pass exams' (durch 'through', kommen 'come'). Leaving out the affix may do more than just removing adverbial or aspectual modification; it may change the whole meaning of the verb.

ii. The affix-plus-base combination usually has its own set of subcategorization restrictions which are not predictable from the base verb. Thus: Ich lache ihn (acc) aus. 'I laugh at, scorn him', but \*Ich lache ihn. ('I laugh him.').

iii. The affix-plus-base combination has its own set of selectional restrictions. Thus:

(9) Er hat { das Baby } täglich ausgefahren.  
          { \*den Wagen }

'He took the baby out (for a walk) daily.'

- (10) Er hat { den Wagen } täglich gefahren.  
           { \*das Baby }  
       'He drove the car daily.'

iv. In general, the perfect tense auxiliary may be haben or sein. Verbs that take sein usually denote a change of location or state. From hat geschlafen 'slept' and ist eingeschlafen 'fell asleep', it is clear that the auxiliary for the separable combination is determined by the meaning of the whole, and is not simply the base verb's auxiliary.

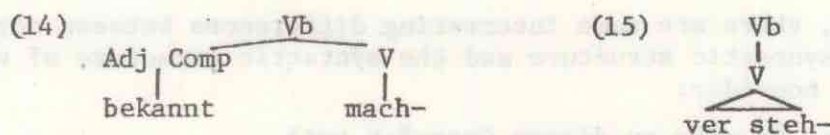
v. Further evidence that affix-base combinations comprise a single lexical unit may be found in the following minimal pairs:

- (11)a. Du sollst dá stéhen.  
       'You should stand there.'  
       b. Du könntest mir helfen, anstatt nur dázustéhen.  
       'You could help me instead of only standing around.'
- (12)a. Die Leiter hat fést gestánden.  
       'The ladder stood fixed, without rocking.'  
       b. Es hat féstgestánden, dass...  
       'It has been established that...'
- (13)a. Ich habe die beide miteinander bekánn gemácht.  
       'I introduced the two to each other.'  
       b. Er hat die Verordnung bekánngemácht.  
       'He publicized, made officially known, the decree.'

If da and stehen, fest and stehen, and bekannt and machen were not single lexical items in the (b) sentences, it would be difficult to account for their semantic, phonological and orthographic unity in (11)b-(13)b and the non-unity or transparency in (11)a-(13)a. Syntax alone will not characterize these differences; bekannt 'known' in (13) has the same grammatical function (adjective complement) in both (a) and (b). It is the specialized meaning of the combination in (13)b, not a distinct syntactic structure, that permits bekannt's fusion to machen; this specialization in meaning is the earmark of a single lexical item.

1.2.3. Having argued that affix-base combinations comprise single lexical items, I now need to clarify what sort of lexical item. That is, having shown the affix and base to form a unit on some level, I need to specify which level. There are two major possibilities. One is that these combinations be treated as idioms where affix and base each belong to some lexical category so that the combination fits into a syntactic tree and is at some point dominated by a syntactic node (any node but the lexical category node V). Thus the combination has internal syntactic structure. The combination is inserted into the tree discontinuously (as per Jackendoff (1975:663)), and differs fundamentally from the inseparable<sub>1</sub> verb which is dominated by V and has internal morphological structure. To illustrate this first possibility:





Thus the difference between (13)a and (13)b under this analysis is that in (13)b, bekannt and mach- are inserted into structure (14) as a single idiomatic unit, whereas in (13)a, the two items are generated independently by rewriting rules.

The second possibility is that affix-base combinations belong to the lexical category V, and thus are dominated entirely by V in the tree, the difference between inseparable and separable verbs being given by differing morphological structure:



The first approach, treating the affix-base combination as an idiom, is appealing, since it accounts for the specialized, extended and opaque meanings; it also accounts for the fact that many affixes (e.g. bekannt) clearly have a grammatical function which might appropriately be captured by syntactic structure. The idiom approach expresses the semantic unity of these combinations while preserving their diverse syntactic origins--diachronically, certain sentence elements (adverbs, prepositions whose NP objects were lost through conventional usage, adjective complements, nouns, and verb infinitives from reduced sentential complements) would habitually appear next to a verb in its clause-final position (as participle, infinitive, or in subordinate clause word order) and acquire a specialized meaning with that verb. This combination of sentence constituent-plus-verb then crossed over the fuzzy line from syntactic transparency to single lexical unit status.

There are problems with the idiom analysis, however, and I shall argue instead for morphological rather than syntactic structure. The first problem is that we need to give a synchronic account for the diachronic process sketched above. We need to capture the fact that all affix-base combinations--regardless of syntactic origin--exhibit the same rigid word order, stress and morphological patterns shown in (2)-(8)b. That is, if these are all idioms having diverse underlying syntactic structures, they are nonetheless suspiciously similar in their behavior on the surface. Furthermore, not all combinations are syntactically transparent. Some affixes don't exist other than as affixes, for example, inne- in innehaben 'to hold office, occupy an apartment' (haben 'to have'). What syntactic category should inne- have? A third problem is that some affixes have diverse functions: aus 'out' may be aspectual (completive) in Es blutete aus 'It bled dry'; aus may resemble an adjective complement akin to causatives, as in Sie buhten ihn aus 'They booed him out, caused him to be out by booing'; and aus may still retain its prepositional meaning, as in Sie gruben ihn aus 'They exhumed him, dug him out (of  $\Delta$ )'. Should there (or can there) be syntactic categories that dominate aus in each of its functions? I prefer to write semantic, not syntactic, rules to capture the different roles aus can have, yet the idiom analysis would have to assign aus to three syntactico-lexical categories.

Finally, there are some interesting differences between normal, transparent syntactic structure and the syntactic structure of many affixes. For example, consider:

- (18)a. Er nahm an diesem Gespräch teil.  
'He took part in this discussion.'

teil is clearly related to the noun das Teil 'piece, part'. Normally, nouns occur in syntactic structure before prepositional phrases, not clause-finally. If teil is to be considered a noun syntactically, we have to modify the PS rules. Furthermore, this noun, unlike others, can't have modifiers (nor can it be capitalized). As another example, analyzing aus in ausgraben as a preposition means generating a PP with a  $\Delta$  object. This might reflect the original structure of the expression, but no NP ever shows up to replace  $\Delta$ ; if an object NP is explicitly encoded, it shows up as the object of a separate PP:

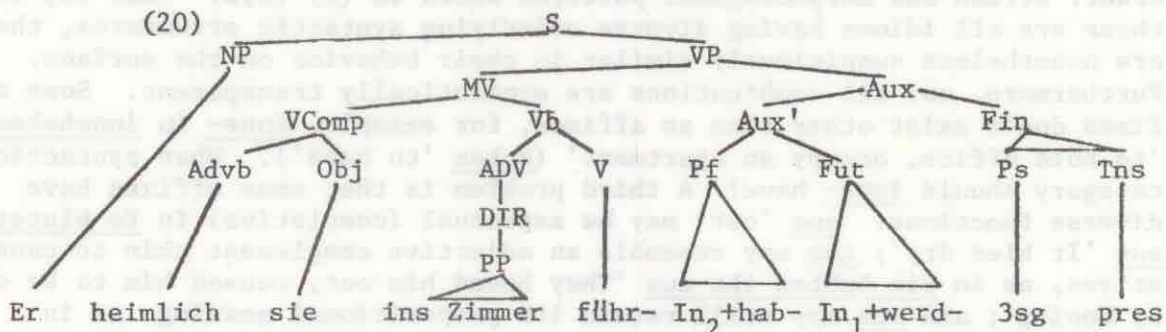
- (18)b. Er hat den Körper aus der Erde ausgegraben.  
'He exhumed the body out of the earth.'

Since the affix-base combination often has opaque meaning, its own subcategorizational and selectional restrictions, and a unique auxiliary, it acts like other members of the lexical category V. I will assume that these combinations belong to V and that their internal structure must be characterized morphologically. In the remainder of this paper, I will compare linear and hierarchical characterizations of this structure to evaluate which best facilitates the formulation of rules that account for the configurations of affix and base outlined in section 1.2.1.

2.0. Morphological and syntactic rules which refer to the internal structure of these lexical items.

2.1. Syntax of the verb complex. I will assume for purposes of discussion the syntactic treatment of the verb complex given by Bierwisch (1955) (with the exception of his treatment of separable verbs, discussed in footnote 1). Relevant aspects of his treatment are illustrated in the following tree (20) for sentence (19):

- (19) Er wird sie heimlich ins Zimmer geführt haben.  
'He will have led her into the room secretly.'



ADV dominated by Vb dominates locative or directional complements which are required by the subcategorizational restrictions on the V; Advb dominated by VComp dominates time, manner and place adverbs which are not needed to satisfy these restrictions. This tree is verb-final for inde-



pendent syntactic reasons.  $In_2$  marks participles;  $In_1$  marks infinitives; not employed in this structure,  $In_3$  marks zu-infinitives.

Rules needed to derive (19) include something like Affix-hopping, which moves  $In_2$  from the perfect auxiliary to the V, and  $In_1$  from future auxiliary to the perfect auxiliary. A syntactic rule of Finite Verb Placement moves the finite verb (here, the future aux) into second position in the sentence, since this is a main clause. Then a set of morphological rules converts  $[f\ddot{u}hr]_V + In_2$  into gef\ddot{u}hrt and  $[hab]_V + In_1$  into haben. A third rule inserts the clitic zu in front of  $[verb]_V + In_3$ .

## 2.2. How the morphological rules treat separable and inseparable verbs.

2.2.1. When the base verb is finite, the Finite Verb Placement rule moves the entire inseparable combination, and only the base of the separable combination to second position. Schematically, Placement moves the material to the right of the slash:

(21)      auf      | versteh-  
                      | steh-

2.2.2. The rule replacing  $V + In_3$  with zu#V places zu directly in front of the material to the right of the slash:

(22)      auf      | versteh-  
                      | steh-

2.2.3. The rule creating infinitives out of  $V + In_1$  adds -en to the end of the verb; it doesn't need to refer to the verb's internal structure. Gerund and present participle forming rules, which have verb infinitives as their bases, treat the material to the right of the slash:

(23)      | versteh-  
                      | aufsteh-

2.2.4. The Participle Formation rule requires some discussion. In general, the participle rules will relate f\ddot{u}hr +  $In_2$  to gef\ddot{u}hrt and steh +  $In_2$  to gestanden. The former verb belongs to the morphological class of 'weak' verbs in which the participles take a -t ending and don't have ablaut. The latter verb belongs to the 'strong' class, in which participles often have some sort of ablaut, or even consonant changes, and end in -en. The Participle Formation rule is really a family of rules, one for weak verbs and one for each strong ablaut pattern. Upon consideration of the participles aufgestanden and verstanden, we see that the parts of this rule determining whether or not there is a ge- prefix and where it is placed, as well as the part determining ablaut must refer to the structure of separable and inseparable verbs.

2.2.4.1. The ge- prefix. Some verbs do and other verbs don't have a ge- prefix on the participle:

(24)a.	stéh-	geständen	b.	telefonier-	telefoniert
	stéll-	gestéllt		buchstabier-	buchstabiert
	óhrfèig-	geóhrfèigt		studier-	studiert
	frúhstúck-	gefrúhstúckt		trompét-	trompétet
	glíeder-	geglíedert		berlíner-	berlínert
				spektákel-	spektákelt
	auf trág-	aufgetrágén		begrúss-	begrússt
	bekánn	bekánn-		verstéh-	verstánden
	mách-	gemácht			

Is the presence or absence of ge- morphologically determined? On first glance, it seems possible to formulate a rule: verbs with -ier suffix, verbs of foreign origin, and Germanic verbs with inseparable prefixes do not take ge-, while verbs of Germanic origin without inseparable prefixes do. Besides the fact that there are exceptions to this rule (e.g. berlinert 'to talk like a Berliner' is native), this formulation misses the generalization that the first syllable of each verb in (24)b is unstressed, whereas in (24)a, the ge- precedes a stressed syllable. I assume, with Kiparsky (1966), Bierwisch (1965) and Aronoff (1976), that presence or absence of ge- depends on the stress pattern of the verb: There is a ge- if the first syllable has stress, and there is no ge- if the first syllable is unstressed.<sup>3</sup>

Note that the rule determining presence or absence of ge- depends on and so must follow initial stress assignment, yet it must precede a later rule assigning 1-stress to the first of two unstressed syllables word-initially. This second stress rule (found in Kiparsky (1966)) is needed to account for words like missverstehen, which has two inseparable prefixes (miss-, ver-). The participle is (\*ge)missverstánden, so a stress-dependent ge- assignment rule does not take the 1-stress on miss- into account.<sup>4</sup> Thus:

	miss	ver	steh	
			1	initial stress assignment
--	1	1		<u>ge-</u> assignment
	1		3	first of two unstressed syllables gets stressed

Sandwiching ge- assignment (Participle Formation) between two phonological rules violates Aronoff's proposal that morphological rules are not ordered among phonological ones. For this reason, Aronoff (1976:98) separates Participle Formation into two rules-- the first, purely morphological, affixes ge- to all verbs; the second, purely phonological and ordered between initial and later stress rules, deletes ge- before unstressed syllables. This has no effect upon my analysis. What is important is that whatever rule assigns ge- checks the stress of the verb's first syllable (before the second stress rule). For inseparably prefixed verbs, the rule refers to the first syllable of the entire derived verb, so the unstressed ver- in verstéh- blocks ge- in the participle; the rule does not check the first syllable of the base verb (\*vergestánden). For separably prefixed verbs, the rule checks the first syllable of the base verb, thus: aufgestánden, aúsdiskutíert (no ge-), and ánerkánn (no ge-). The 1-stressed affix is not part of the conditioning environment (\*geaufstánden). This rule places (or refuses to place) ge- in front of



the material to the right of the slash:

(25)      | versteh-  
auf        | steh-

2.2.4.2. Ablaut. Some part of the Participle Formation rule must be responsible for changing (or relating) the eh in stehen to the and in standen and determining whether there is a -t or -en ending. From the following triplet--verstanden, aufgestanden, gestanden--it is clear that we want to relate the base verbs to the independent verb stehen; that is, the ablaut part of the rule considers the material to the slash's right:

(26)      | steh-  
ver        |  
auf        | steh-  
           | steh-

3.0. Phonological rules which must refer to the internal structure of separable and inseparable verbs.

3.1. I could find no phonological processes (e.g. obstruent devoicing, deaspiration, assimilative voicing, glottal stop insertion) which applied to one kind of verb but not to the other.

3.2. Stress rules. I will propose a plausible set of stress rules, many of which come from Kiparsky (1966). It is beyond the scope of this paper to argue conclusively for these rules over other possibilities.

I assume an Initial Stress Assignment rule (ISAR) which assigns 1-stress to the base verbs in separable and inseparable combinations. I further assume that separable affixes are assigned 1-stress, although I leave the formulation of the rule open for now. I also assume a Compound Stress rule (CSR) which operates at word level to assign 1-stress to the leftmost of two 1-stresses and reduce the remaining one to tertiary stress. This rule is necessary for noun compounds, as well. This rule is distinct from the Unstressed Syllable rule (USR) stressing the first of two unstressed syllables in words like missverstehen. Thus:

verstehen	aufstehen	missverstehen	ausdiskutieren	
1	1	1	1	ISAR/base
-	1	-	1	ISAR/affix
-	1 3	-	1 3	CSR
-		1 3		USR

The ISAR treats the base verbs alike (27), and the CSR treats affix-base combinations as single words (28):

(27)      | steh-  
ver        |  
auf        | steh-

(28)      | aufsteh-

4.0. Summary of the preceding two sections. The rules listed treat material to the right of the slash as structurally equivalent:

(29)      | versteh-  
auf        | steh-

Finite Verb Placement  
Zu-Infinitive Formation  
Ge- placement part of  
Participle Formation

(30)	ver	steh-	Ablaut part of Participle Formation ISAR
	auf	steh-	
(31)		versteh-	Infinitive, Gerund and Present Participle Formation CSR
		aufsteh-	

5.0. How can we encode the structure of these verbs so that the rules just presented can refer to the appropriate subparts? In this section, I will present some possibilities offered by linear encoding.<sup>5</sup>

5.1. As a first approximation, let us encode the juncture between prefix and base with the boundary '+' and the juncture between affix and base with '%':

(32)a. [ver+steh]<sub>V</sub>                      b. [auf%steh]<sub>V</sub>

Can the rules presented above be formulated in terms of these boundaries? Finite Verb Placement could be formulated: Move [X]<sub>V</sub> + Fin, Condition: X ≠ %. If syntactic rules are to move only constituents, we immediately run into trouble, since this rule will not move the base in (32)b. To solve this, we add another set of brackets:

(33)a. [ver+steh]<sub>V</sub>                      b. [auf% [steh]<sub>V</sub> ]<sub>V</sub>

(33) works for the rules listed in (29) (for example, Ge- Placement might be: [X]<sub>V</sub> + In<sub>2</sub> = ge+X+en, X ≠ %), but note that we have already departed from a purely linear boundary scheme and have given the separable verb a funny sort of syntactic structure. In fact, the boundary '%' merely serves to distinguish the inner set of brackets from the outer one to block rule application to [auf%steh]<sub>V</sub>.

Treating [steh]<sub>V</sub> and [versteh]<sub>V</sub> alike is necessary for the rules in (29), but for the rules in 30, ISAR and the rule which generates or lexically relates ablauted participles and base verbs, the steh- in each verb needs to be considered equivalent. With the present structure, these rules must look at the vowel 'v' in either of the following possible pairs of contexts:

(34)a. [C<sub>v</sub>vC<sub>o</sub>]<sub>V</sub> and [X+C<sub>o</sub>vC<sub>o</sub>]<sub>V</sub>, collapsed: [(X+)C<sub>o</sub>vC<sub>o</sub>]<sub>V</sub>  
 b. [X%C<sub>o</sub>vC<sub>o</sub>]<sub>V</sub> and [X+C<sub>o</sub>vC<sub>o</sub>]<sub>V</sub>, collapsed: [X[-seg]C<sub>o</sub>vC<sub>o</sub>]<sub>V</sub><sup>6</sup>

I find these contexts unsatisfactory. (35)a is only apparently collapsed into a single context; its collapsed form is merely an abbreviation for two rules, an abbreviation that doesn't show directly what the base of the separable verb and the base of the inseparable verb have in common intrinsically, but rather equates them by virtue of position with respect to a boundary, and lexical category. Nonetheless, it is possible to write a Participle Formation rule: [(X+)C<sub>o</sub>ehC<sub>o</sub>]<sub>V</sub> + In<sub>2</sub> = ge(X+)C<sub>o</sub>andC<sub>o</sub>+en. (35)b, identifying the vowel as the first one after either boundary, forces us to split the participle rule in two, as the context for ablaut abbreviates information necessary to the context for Ge- Placement. This formulation doesn't allow us to refer simultaneously to both levels of structure (schematized by (29) and (30)) required by the whole process of Participle Formation.



It may be possible to reflect formally that the two bases are equivalent by introducing yet another boundary, say, '!':

(35)a. [ver!steh]<sub>v</sub>

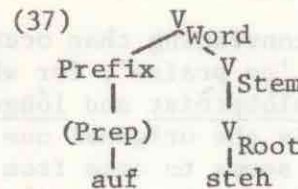
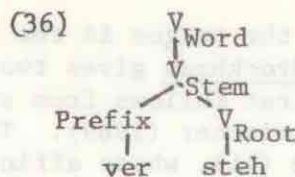
b. [auf%![steh]<sub>v</sub>]<sub>v</sub>

This becomes confusing and still has the problem of frustrating simultaneous reference to both levels of structure in a single rule.

Taking up the open question of assigning 1-stress to affixes, we find that specifying a % boundary in the rule can prevent stress assignment to prefixes as desired, as well as account for stress differences in lexical items composed of the same elements in different structures, e.g. durch-fahren 'to drive through' and durchfahren 'to drive throughout'. But it is not enough to write a rule like:  $V \Rightarrow 1\text{-stress}/\_C_0(VC_0)\%$ , which only makes reference to a boundary, since affixes are stressed according to internal structure: bekannt--bekanntmàchen; davón--davónlâufen; fértig--fértigmàchen; schwímmen--schwímmengêhen. Stress assignment will have to take into account the lexical category to which the affix originally belonged; a more general lexical category 'Affix' seems necessary to cover affixes like inne- which belong to no other category, as well as affixes belonging to the category 'Preposition', which in most analyses are not assigned stress, initially.<sup>7</sup>

5.2. To summarize the preceding section: if the difference between the structures of separable and inseparable verbs is to be encoded by different boundaries, these boundaries must be supplemented by brackets (like V or Affix) or other boundaries (!). The same juncture between auf and stehen must be marked by a boundary and a bracket or by two boundaries in a row. But this is no longer linear; the two boundaries indicate what is obvious in section 4.0--that, on some level, the base verb in the separable combination is morphologically equivalent to the entire inseparable verb, whereas on another level, the base verbs in both combinations are morphologically equivalent. To express these levels of organization formally, we must refer to a hierarchic structure of notions like word, stem and root.

6.0. The hierarchic analysis. The following structures for auf-stehen and verstehen facilitate straightforward formulation of the relevant rules without ad hoc devices or opaque formalism:



Finite Verb Placement:  $\text{Move}[X]_{V_{\text{Stem}}} + \text{Fin}$

Zu-Infinitive Rule:  $[X]_{V_{\text{Stem}}} + \text{In}_3 \Rightarrow \text{zu}\#X+\text{en}$

Infinitive Rule:  $[X]_{V_{\text{Stem}}} + \text{In}_1 \Rightarrow X+\text{en}$

Participle Rule:  $[X[C_0vC_0]_{V_{\text{Root}}}]_{V_{\text{Stem}}} \Rightarrow \text{ge}+X C_0v'C_0+\text{en}$

ISAR: All roots take 1-stress. (Affixes discussed below)

CSR:  $[...1...1...]_{\text{Word}} = [...1...3...]_{\text{Word}}$

6.1. Several possibilities suggest themselves for the characterization of separable affixes. We could still adopt the solution mentioned above in connection with boundaries--we could have a lexical category 'Affix', with an Affix node instead of a Prefix node in (37). (Inseparable verbs would still have Prefix nodes). Assigning inseparable prefixes and separable affixes to distinct lexical categories reflects the fact that native speakers know that ver-, be-, ent-, zer-, and er- are always inseparable; durch, um, unter, über would belong to each category by virtue of pairs like durchfahren and durchföhren, mentioned in 5.1.

The possibility employed in (37) is to make use of the hierarchical structure to define the difference between inseparable prefix and separable affix. Here we need only one lexical category 'Prefix' and two structures, with stress assigned to 'Prefix dominated by Word' but not to 'Prefix dominated by Stem'. Like Affix above, the category Prefix captures the fact that affixes behave the same in spite of their diverse syntactic origins, yet unlike the Affix solution, which provides us with [durch]<sub>pr</sub> and [durch]<sub>af</sub>, the Prefix solution gives us a single [durch]<sub>pr</sub> that can occur in two structures.

An advantage of defining affixes as 'Prefix dominated by Word', is that we can capture the fact that stress and structure are intimately connected and serve to define each other. Bierwisch (1965:118) states that the prefix miss- in missverstehen 'to misunderstand', though inseparable, is occasionally used unintentionally as a separable affix as in:

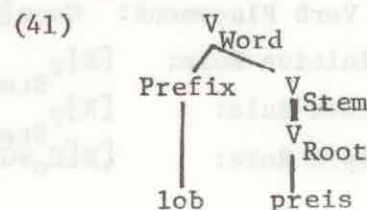
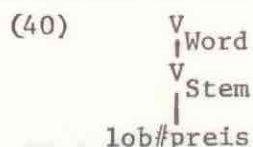
(38) \*Wir verstehen uns in diesem Punkt miss.

although miss- is never accidentally used in a sentence like (39):

(39) \*Ich traue ihm miss.

The reason, he says, is that in (38), miss- bears 1-stress by virtue of the USR, whereas in (39), miss- in misstrauen 'to mistrust' cannot be assigned that 1-stress. Some speakers occasionally take this USR-assigned stress in missverstehen to be the stress assigned to 'Prefix dominated by Word', permitting them to analyze the verb according to structure (37). Under this analysis of the word, Finite Verb Placement can move the 'new' Stem verstehen to second position.<sup>8</sup>

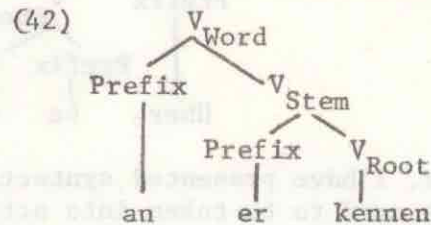
More convincing than occasional slips of the tongue is the case of lobpreisen 'to praise', for which Der Sprach Brockhaus gives two participles: gelobpreist and lobgepriesen. The first follows from structure (40), and is the original one, according to Fleischer (1969). The second participle seems to come from a structure like (41), whose affinity to (40) may be explained by the main stress on lob in lobpreisen.



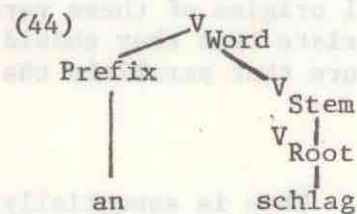
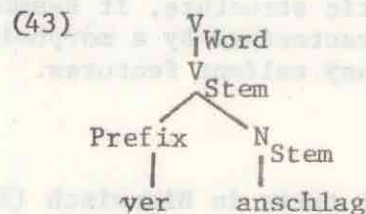
The strong ending and ablaut in lobgepriesen are predicted by (41), since V<sub>Root</sub> will follow the same ablaut rule as does the independent verb preisen (gepreisen), which is dominated by both Stem and Root.



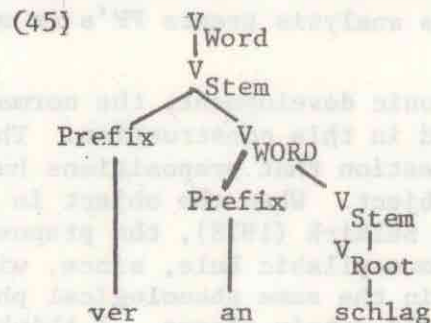
6.2. The analysis proposed permits us to account for verbs like anerkennen, which have a separable affix before an inseparable prefix, while explaining why we don't get inseparable prefixes in front of separable affixes. The structure for anerkennen is given in (42):



Consider the verb veranschlagen, which apparently has an inseparable prefix before a separable one. However, the weak participle veranschlagt indicates that it is not to be related to the separable verb anschlagen with strong participle angeschlagen (the simple past tense morphology shows the contrast more clearly: veranschlagte vs. schlug...an). The following structures explain these facts:



What we don't get is a structure like (45):



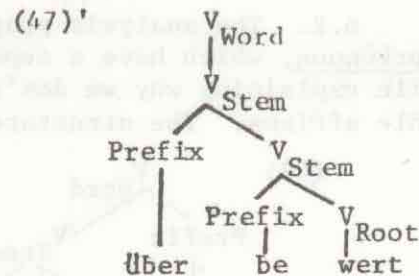
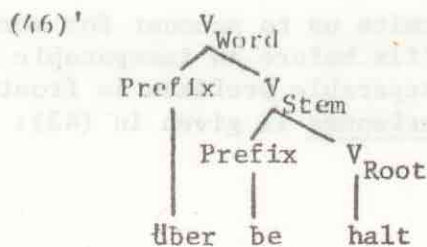
which would predict the same participial and past tense morphology for veranschlagen and anschlagen. This may be due to a constraint not allowing Word to be dominated by Stem.

6.3. The analysis proposed shows clearly how the two verbs Überbehalten and Überbewerten can have apparent structural and stress-wise identity in infinitives and participles (hat Überbehalten, hat Überbewerten) but act differently in main clause simple tenses:

(46) Ich behalte beim Einkaufen kein Geld Über.  
'I don't have any money left over after shopping.'

(47) Ich Überbewertete es.  
'I valued it too highly.'

The corresponding morphological structures are:



7.0. Conclusion. In this paper, I have presented syntactic, morphological, and phonological rules which need to be taken into account in order to characterize the structure of separable and inseparable verbs. Whereas purely phonological considerations have generally led to boundary type analyses, problems of this sort--on the interface between syntax and phonology--are much more demanding. I hope to have shown that the use of boundaries to encode structure is inadequate, whereas hierarchies of the notions Word, Stem, Root, and Prefix made the rules easier to formulate and accounted for the data straightforwardly. Considering the historical origins of these verbs in syntactic structure, it seems only appropriate that they should be best characterized by a morphological structure that parallels the syntax in many salient features.

#### FOOTNOTES

1. This is essentially the approach taken in Bierwisch (1965). He proposes a syntactic node Vb dominating ADV and V, where ADV is rewritten either as a locative or directional PP or as an Affix. While this captures the fact that many affixes have a locative or directional meaning, it ignores the fact that many don't. This analysis treats PP's as syntactic equivalents of affixes.

2. At some point in the diachronic development, the normally unstressed prepositions became stressed in this construction. This may be explained by Margaret Langdon's suggestion that prepositions have stress unless they can cliticize to an NP object. When the object is omitted, the preposition can't cliticize. In Selkirk (1978), the preposition as an affix would be an exception to the Monosyllabic Rule, since, without an NP object, there is no strong syllable in the same phonological phrase. Prepositions in this construction would retain stress. I think these account for the diachronic acquisition of stress. Although this remains a possibility for a synchronic analysis of stress assignment, I will argue later that stress is assigned based on the morphological structure of the lexical item (since not all affixes are ex-prepositions).

3. Paul Verluyten brought out the fact that in Dutch, words like telefonieren do have a ge in the participle, and that ge is morphologically conditioned not to occur with inseparable prefixes. John Newman mentioned that the same was true in an earlier stage of German. Considering the present state of affairs, it appears that the conditioning environment has generalized from unstressed inseparable prefixes to unstressed initial syllables.

4. I do not take missverstanden as evidence for a morphological characterization of ge- placement, that is, for a feature [+insep] that blocks ge- even when the prefix is stressed. That the inseparable miss- is predictably stressed in verbs only before unstressed syllables calls for a



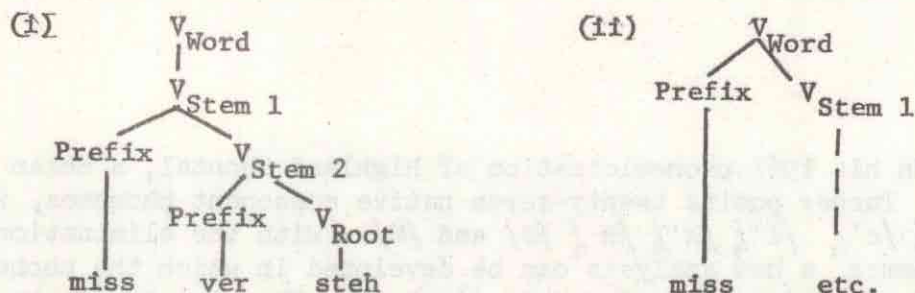
rule to capture this regularity. The participle missverstanden is evidence that ge- placement is ordered before the later stressing rule.

5. By linear encoding, I mean single occurrences of boundaries, e.g. [abc%xyz]. Note that hierarchic structure can be translated into boundary form via double boundaries: [abc%xyz%].

6. This formulation was pointed out to me by Joe Stemberger.

7. But cf. footnote 2.

8. Missverstehen has a structure like (i); I'm suggesting that miss- gets 'temporarily reanalyzed' as (ii) by virtue of its primary stress:



It is also possible that the Finite Verb Placement rule moves Stem 2 rather than Stem 1 in this case. That is, if Placement has a condition on X that  $X \notin [Y]_{\text{Stem}}$ , then (38) could be accounted for by a 'temporary loss' of this condition.

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