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English Derivational Morphology Without Added Syllables*

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It is a commonplace that morphologic differentiation of major word classes runs to two extremes in English. On the one hand, suffixal morphemes such as *-ment*, *-ness*, and *-ion* to mark nouns and *-ize*, *-ify*, and *-ate* to mark verbs allow the quick and clear differentiation of these two word classes. But the other extreme, that of a total lack of formal differentiation, is equally well represented in English by such classes as denominal verbs [*can* the peaches, *pocket* one's change, *roof* the house] and deverbal nouns [a common *scold*, a *lay-up*, the *lie* of a golf ball]. In fact, the lack of difference between corresponding nouns and verbs such as these led a recent writer on the subject (Lieber 1981:124) to abandon altogether possible derivational relations between members of such correspondences, thereby leaving such terms as "denominal verb" and "deverbal noun" with only notional importance, directionality having been lost with derivation.

This paper will propose an interpretation of some of what lies between the two extremes, in particular the interesting pairing of form that occurs between many nouns and verbs in English, as exemplified in (1):

- (1) *believe*, *house*, *bathe*, *choose*, *expand*, *portray*, *implement*, *delegate*,
conduct, *ump(ire)*, *exam(ination)*.

Each of the verbs in (1) has associated with it a noun of very close phonetic form: for *believe*, there is *belief*; for *expand*, *expansive*; for *conduct*, *conduct*, etc. In the interests of descriptive parsimony, I will call members of such pairings "twins". The purpose of this paper is to describe "twinning" as it relates to verbs and nouns, and to give the outlines of a hypothesis which will allow us to consider twinning as a normal component of category differentiation and of word formation processes in English.

Twinning has three salient features, the first of which could be considered definitional: twins occur when formal differentiation is accomplished without adding syllables for (in this case) either verb or noun. Such patterns could be considered a peculiarity in English, where the normal span for derivational morphemes is a syllable. Second, the several means for differentiating noun and verb follow easily stated schemata, and moreover are exceptionless—if there exists a means of differentiating verb from noun, that means will never differentiate noun from verb, the reverse. The third salient feature is that the effect of any of the means has a strong similarity to the effect of any other and thus, there can be seen at work a generalized strategy for differentiating verb-noun twins.¹

There are four means of differentiation which we will examine: final obstruent voicing changes (as in *belief*, *believe*; *expansive*, *expand*), final low-stress vowel differences (*implement* [ɪmˈpləmənt], [ɪmˈpləmənt]), stress repositionings (*conduct*, *conˈduct*), and truncation possibilities (*exam* < *examination*, **exam* < *examine*). That is, we have examples of differentiation signalled at segmental level, at syllable level, at word level. Given this range of affected levels, a sufficiently perspicuous general statement covering the phenomena must rely on some very basic assumptions. The hypothesis which I will offer in this paper does not rely on particularly well-known assumptions and could be considered extreme. In outline it is simple to state: when differences are relevant, nouns and verbs differ in their basic prosodic makeup, each emphasizing stress elements like pitch, duration, and intensity differently. Our attention will thus be focused on such primitives as vowel

length, word length, stress levels, and vowel quality.

The rest of this paper is organized as follows: first, a survey of the classes and subclasses of twins which show the requisite kinds of differentiation. Second, there will be a short section on morphological conversion (Marchand 1960:293ff; Lieber 1981, chap 3), the multiple use in different word categories of word forms which are not marked for category change. Morphological conversion is normally invoked only when noun-verb (for example) twins are identical in form, but Lieber gives a persuasive account of how twins differing in stress placement (as in *import*, *torment*, *conduct*) should also be considered examples of conversion. Since this type of twinning defines one class of form-difference relevant here, it is possible that all of our classes have a conversion interpretation. Finally, we will conclude with a discussion of the kinds of explanation which might best describe the patterns of differentiation we have looked at. Two of these kinds of explanation are of historical importance: structural-derivational, as in Chomsky and Halle's discussion of *permit*, *torment*, and *survey* (p. 96), and rhythmic-hierarchical, as in Liberman and Prince 1977 et seq (well critiqued and extended in Hayes 1984). The third will be offered new here.

Stress repositionings. Central to the problem of twinning is the well-known phenomenon of stress repositioning or shifting; the following short list (SPE, p. 96) is typical of examples given when it is discussed:

- (2) *transfer*, *permit*, *export*, *survey*, *protest*, *insert*, *progress*, *convict*,
suspect, *torment*, *combine*

It is likely that this list does not represent as pure a sample as its authors intended: the underlined items are not necessarily pronounced differently as nouns and verbs, the forestressed noun pronunciation serving for both noun and verb. (There is also the oddness of William Powell's *Thin Man* pronunciation of *suspect* (n), which he gave with afterstress.)

However, no matter what neutralization takes place (and we can always find examples to replace the neutralizations), the following well-known generalization holds: if there is a stress-positioning difference in the pronunciation of nouns and verbs of Latin-derived bisyllabic prefix-stem compounds, then the noun has leftward stress, the verb rightward. Like all of the means of differentiation we will look at, the directionality is exceptionless; we simply do not find noun twins with primary stress further to the right than their corresponding verb twins.

The centrality of the stress-shift phenomenon derives from two important considerations. First, stress-shifting is structurally central to the general pattern: it represents differentiation at a level higher than final obstruent voicing changes (on the surface, a segmental difference) and presumably lower than truncation (word integrity not being violated); this central position should be exploited by any attempt at explaining the general pattern.

More immediately, however, it is the sheer number of examples of stress repositionings that attracts our attention. The number is admittedly not evident from (2) or the larger set which (2) is intended (I presume by all writers on the topic) to represent; these are, after all, a closed class of perhaps 100 twinned pairs. But the elements of the description "Latin-derived bisyllabic prefix-stem compounds" play no Boolean role in this twinning process; they are simply an accurate description for (2). We can change some of the descriptive elements and still observe twinning. We can, in fact, move from this small class to much larger ones by manipulating the description appropriately. Consider, for example, historical source:

- (2') Non-Latin-derived bisyllabic prefix-stem compounds: *fore'see* (*'foresight*), *fore go* (*'Forego* [the racehorse]) (Kenyon and Knott list 10 twin-pairs with *fore-*);

free vs bound morpheme used as stem:

- (2'') Non-Latin-derived bisyllabic prefix-stem/word compounds: *mis-* (*call, play, deal, fire*), *dis-* (*card, mount*), *re-* (*play, call, hash, sell*);

and free vs bound morpheme used as prefix:

- (2''') Non-Latin-derived bisyllabic (free)prefix- (free)stem compound: *over-* (and for some examples, *under-*) (*flow, hang, charge, lap, turn*).

What we are seeing here is a gradual movement from the mutually bound prefix-stem combinations in (2) through the singly bound examples with *fore-* (the stem already an independent word, though the stem-class is closed) *mis-*, *dis-*, and *re-* (the stem independent, the stem class open) to examples where *both* prefix and stem are also independent forms.

But we are also seeing a movement from the strict **word-level** organization of morphemes (modifier-head) to a **phrase-level** organization: the verbal prefix *over-* can have alternate expression as a preposition (*to overhang, to hang over, to overlook, to look over; to overflow, to flow over*). This possibility of word expression does not, however, diminish the possibility of twinning. If we allow the substitution of verb phrase for verb word in the case of the verb twin, we in fact enhance the possibility of twinning—the combination of the richness of syntactic patterning in verbs and their adjuncts and a corresponding heavy use of nominalizing stress to freeze those patterns in their verbal order makes stress repositioning an important word-forming process.

The sample of stress-based nouns in (3) gives some idea of the interactions of verb and noun via stress repositioning;

- (3) A fuller spectrum of stress-based nouns:

telescopes:

- (a) *coverall, spitfire, pinchpenny, scarecrow, pickupsticks, knownothing*.
(b) *come-on, putdown, flutterby* [> *butterfly*], *runaway, get-together*.
(c) *has-been, also-ran, say-so, know-how, what not*.
(d) *hand-me-downs, shoot-'em-ups, forget-me-not, know-it-all, pick-me-up*.
(e) *whatchamacallit, doohicky, thingummy, jobbydoo, gizmo*.
repetitives:
(f) *no no, dum-dum, muu-muu, (vs. pooh 'pooh)*.

Each of these subclasses deserves some discussion. Telescopes, ((a)–(e)), a term I will use to describe all compactions of phrasal material into noun words, have various sources: (a) represents a pattern productive in Early Modern English (compare *pinchpenny* with *penny pincher*) with occasional new members today; (b), the telescoping of verb (whether transitive or intransitive) plus particle, is an almost unrestricted process; (c) shows some of the grammatical range which telescoping can apply to; (d) may show an interesting constraint on inclusion of object pronouns; (e) represents examples of noun-sounds you make when you can't think of the noun you wanted to say.

Both (e) and (f) strike me as important evidence about the sound pattern of nouns, (e) because of the agreement among the forms as to what the stress placement should be, no matter the source of the form (*whatchamacallit* is a telescoped *what you might/may call it*; the others are less transparent), and all serving to say "Noun!"; and (f), in which items have parts repeated without imputable direction (which 'no' is a copy of which in *no no*?) yet the nouns in (f) (as well as *tum-tum*, *tom-tom*, *dodo*, *boo-boo*, *lulu*, *yo-yo*, and *B.B.*) have leftward stress and *pooh pooh*, a verb, has rightward.

What is to be made of all this noun detail? For one thing, it should be obvious that word formation studies in English must reach beyond traditional endocentric considerations. Aronoff (1976), for instance, (*Word formation in generative grammar*), devoted little discussion to even the basic corpus of twinning and none at all to the phenomenon of telescoping, yet I think that the importance and range of both is plain. To restrict oneself to the study of suffixal morphology is to miss an essential aspect of English.

Second (and to close this section on stress), by including phrasal sources for nouns we have exposed an important asymmetry. As long as we confined ourselves to (1) and (2), we were dealing with word—word interactions and could focus exclusively on stress position. But the data in (3) show that there are allied problems, stress position and syntactic level. The question is obvious: what is the relationship among nouns, leftward stress and potentially lower syntactic level?

Final syllable reductions: Of the three classes of twinning left to discuss, two explicitly involve the phonological reduction of the final syllable(s). The first contains words ending in *-ate* with antepenultimate stress, and polysyllables ending in *-ment*:

(4) Final low-stress vowel reductions:

-ate: *delegate, precipitate, aspirate, initiate, syndicate.*

-ment: *implement, regiment, compliment, complement, experiment, segment, fragment.*

The differentiation here of verb and noun is once again well known: if there is a formal difference between them, the verb has a full, unreduced vowel in the final syllable; the noun, a reduced one: *experiment* [ekspérəmənt] (v), *experiment* [ekspérəmənt] (n); *syndicate* [sɪndikət] (v), *syndicate* [sɪndikət] (n).² In the section below on explanatory possibilities I will offer a suggestion as to why it is *-ate* and *-ment* which participate in this reduction; however, lest anyone assume that the process (as opposed to the classes which it affects) is closed, consider the two common pronunciations of *program*, [prógræm] and [prógɹəm]; which is the noun and which the verb should be obvious.

Truncations: The second class of final syllable reduction involves actual loss of final syllables and involves a by now familiar but still curious asymmetry: final syllables are lost from verbs only if they have been lost from corresponding nouns:

(5) Truncations:

(a) *deto(x)ification, ump(ire), ad(vertisement), crip(ple).*

exam(ination), rehab(ilitation), demo(nstration), supe(rvisor).

(b) *ref(eree).*

(c) *prep(are, -aration), recap(itulate, -itulation).*

(d) *veg(etate), veggies (vegetables).*

Examples in (5a) represent the most restrictive case: one is an ump, one does not ump; one buys space for an ad in the classified section, but does not ad for a housemaid, and so on. In (5b), *referee* and *ref* both seem to be verb and noun, but it is my intuition that *ref* as a verb is denominal (certainly consistent with the generalization). The cases in (5c) are problematic as to category source but meet the necessary conditions on truncation. The forms *veg* and *veggies*, while providing differing truncation outputs, provide them in correct historical order: *veg* is of recent origin; *veggies* has been used for years.

Reprise. Before going on to discuss our last class, final obstruent voicing changes, I would like to attempt a provisional interpretation of twinning: in what way are the three processes we have looked at alike in effect (as offered earlier in the paper)? We have one process which reduces final stress (through stress repositioning), another which reduces vowels in final syllables, and a third which elides final syllables in polysyllabic words, leaving only one or two initial syllables. I think that a fair description of the totality of these processes is that they serve to make nouns **phonetically less** than verbs. Only in the case of stress shifting might there be a question as to whether twins differ in length (is *import* (n) shorter than *import* (v)?) but here too we may infer agreement: first, the region of the word away from which stress is shifted is also the region affected by reductions and truncations, and second, a common effect of stress shift is to allow a reduction in syntactic rank of the output, i.e., a subordination.

But all of these processes range over words of more than one syllable; the last class we will examine is composed primarily of monosyllables, yet we will see that the differentiation which this twinning produces also allows a longer-shorter, less-more interpretation, even though the affectable span is so limited.

Final obstruent voicing: There are two subclasses of interest. The first, basically monosyllables ending in fricatives, is familiar to anyone who ever made up the pronunciation [rus] for the word *r-u-s-e* and later learned better. Unfortunately for those speakers, *r-u-s-e*, a noun, does not have a verb twin, while the nouns in (6)—models for [rus]—do:

(6) Final fricative voicing, nouns only:

- /θ/ - /ð/ : *bath, breath, teeth, wreath, sheath, cloth*
- /f/ - /v/ : *half, relief, shelf, thief, proof, grief, strife.*
- /s/ - /z/ : *use, excuse, abuse, house, advice, device, loss, choice, refuse, glass, price (prize), peace (appease), merchandise.*

This is intended to be representative of those nouns which pair with verbs through alternations of final fricative voicing. Unlike (2)-(5), whose twins exhibit productive synchronic possibilities, (6) contains nouns which have a seemingly active relationship with their corresponding verbs (*belief, proof, use, shelf*), those which can be recognized as probably having a formal relationship, once the verb candidate is pointed out (*glass, strife, serf, refuse*), and those for which a connection to the correct verb is evident only in etymological formulas in larger dictionaries (*peace, spouse, price*). In short, it would make little sense to concoct a synchronic statement relating noun and verb: the class is closed and has been for centuries (some people do not distinguish the two pronunciations of *merchandise*, voicing both cases).

However, no matter how tenuous the modern relation is or how ancient the split between noun and verb (Old English, Middle English, Old French, Latin) or how different the routes to the present have been (back formations, for

instance, or one form descending through Middle English, its mate borrowed into Early Modern English), the directionality in this voicing alternation is one-way: if a noun and verb differ only in the voicing of their final segment, in this case a fricative, the verb contains the voiced segment and the noun the voiceless. Because of the stability and simplicity of this asymmetry, I would like to ignore here its historical complexities and consider instead the present-day linguistic consequences of the difference.

In doing so, we must first deal with the general question of closed syllables and the effects that changes of voicing of the closing segment cause. The primary effect is one of changes in length in the immediately preceding vowel: a syllable closed with a voiceless segment has a much shorter vowel than the analogous syllable closed with the corresponding voiced consonant. The figures in (7) represent the situation well: the vowel [i] was shorter by 37% in a voiceless environment; of all of Keller's vowel pairs, the least decrease was 19% for the vowel [au]. None of this is to say that the syllable itself is 37% or 19% shorter; in fact, because the more fortis voiceless segments are naturally longer than their voiced counterparts, there is a kind of compensating mechanism for overall syllable length, with the outcome that the syllables in the two cases are roughly equal in duration (David Stampe, p.c.).

(7) Measurements of selected vowel nuclei before [t], [d], and silence (#)
(in centiseconds).

Vowel Nucleus	before [t]	before [d]	before #
u	14	21	
u	19	27	35
e	20	25	
i	20	32	38
e	22	31	37
ai	25	34	42

from Keller, *Instrumental Articulatory Phonetics*, 1971, pg. 68.

There is thus an absolute correlation (at least in Keller's work, and presumably generalizable) between voiced consonants and vowel lengthening, voiceless consonants and vowel shortening; it is a tossup whether one or the other is the dominant factor in the category differentiation we are examining. In light of the other kinds of twinning we have looked at, I will take the position here that the voicing contrast provides the phonetic contextualization for vocalic effects, and that the latter are the true source of the differentiation.

Changes in vocalic length are a primary effect of final voicing changes, but not the only one. Differences in length provide opportunities for other processes, and these opportunities are rather fully exploited. There is, for example, the phenomenon of extended prosody in the case of the lengthened vowel. That is, not only is the vowel longer in these cases, but because the longer vowel abuts a voiced segment there is a longer voicing chain, with the result that the syllable can carry a correspondingly longer intonation contour. I have some anecdotal evidence that this might play a role in what we are investigating: I asked friends to pronounce the three words *bait*, *bade*, and *bay* to themselves as single-word declarative utterances and to arrange the words according to vowel length. Everyone agreed that *bait* had the shortest vowel, but there was near unanimous agreement that the vowel in *bade* was longer than the vowel in *bay*, a result that contradicts the figures in (7): there the open syllable vowel always is longer. Two explanations come to mind: one is that what was being perceived as length was in fact length of contour, and

thus there is an even greater prosodic differentiation in the twins which differ by voicing.

The second explanation is semi-prosodic, semi-segmental. In repeating these syllables to myself, I have noticed that one aspect of their pronunciation that I find myself giving attention to instead of vowel length is the tension needed to close the syllable [bed] and the corresponding lack of tension for [be]. The reversal of perceived duration for the two syllables may come from the perception of extra effort that this closure entails. The basis of the extra effort lies in the conflict between the airflow needed for voicing and the cessation of airflow entailed by oral stops. In light of this conflict, what is interesting about the alternations exhibited in (6) is that they are fricative-based; thus, at least some of the conflict inherent in final voicing is diminished, or put differently, the possibility for functional use of final voicing alternations is enhanced, since voiced fricatives allow more freely the interplay of voicing and closure.

Changes in vowel length lead to changes in vowel quality. One change, which seems to play no role here, involves the lax vowels with their weak centralized offglides that one can hear in slower speech. These offglides can be quite distinct before voiced consonants; less so or not at all before voiceless consonants: thus, [hɪ^əd], [hɪt]; [kæ^əd], [kæt]; [kɔ^əd], [kɔt].

The more noticeable change in vowel quality is represented by the present-day treatment of the diphthongs /ai/ and /au/: before voiceless segments the nucleus is centralized, thus [hə^t] versus [hʌ^d]; [hʌ^Us] versus [hʌ^Uz]. Presumably a centralized nucleus requires less tongue excursion than a lowered nucleus does, and hence less time for articulation.

Alveolar obstruents. This discussion of vocalic effects leads us to the second sub-class of noun-verb twins differing in final voicing. It is a much smaller subclass than (7), mostly Latinate and French in origin, has the same problems of derivational immediacy (*descend* and *descent* are no doubt actively related, and *rend* and *rent* are no doubt not) and of historical complexities, and is just as exceptionless with respect to voicing and category assignment:

(8) Nasal (+ dental obstruent)

(a) *intend* (*intent*), *descend*, *extend*, *rend*.

(b) *defend*, *respond*, *expand*.

(c) *restrain*, *join*.

Residue: *portend*, *portray*, *pretend*, *succeed*, *exceed*.

For the examples in (8) involving nasal clusters our discussion of vocalic changes has immediate value: as the treatment of /ai/ and /au/ suggests, the shortening and lengthening of vowels before voiceless and voiced obstruents can be viewed as a kind of measure of opportunity for complication—the less time given for vowel pronunciation, the fewer ancillary movements, segments, prosodies associatable with the vowel. Just so with nasal segments: before voiced [d], for example, full articulation of [n] is natural: *intend*, *rend*, etc, but before voiceless [t], little of the segmental articulation of [n] survives: *intent*, *rent*. The articulation of the nasal segment before voiced [d] is of course an event extended in time, parallel to the fuller [a^U] and [ʌ^I] articulations of the discussion (and [n] can be, because of its voiced nature, a carrier of prosodies).

The examples in (8c) can be handled quite easily: verbs lack a voiced final obstruent, the nouns have a voiceless one, and the asymmetry is preserved.³

One might speculate that the mechanism which favors fricatives as the carriers of final voicing changes (instead of plain oral stops, for instance)

also favors nasal-obstruent clusters, the obstruent providing the voicing context and the nasal providing extra voicing harmony. On this account only *succeed-success* and its rhymes rely solely on the voicing distinction.⁴

Finally, there are examples in which more than one twinning process appears to have effected the differentiation of noun from verb: *portent* and *portend*, *refuse* and *refuse*, *pretense* (in one pronunciation) and *pretend*, *detox* (from *detoxification*), and *portrait* [pɔrtreɪt] and *portray* (an interesting example of three processes combining, though the vowel reduction necessary is only analogous to (3)).

Reprise II: With final devoicing we have added a second kind of truncation to the list of twinning processes. The rather lengthy discussion was necessary because of the wealth of detail that voicing changes supply. Let us add that detail to what we already know about noun and verb twins:

- (9) Nouns: shorter, less of relevant phonological material, less opportunity for prosody carrying, subordinate forms (word only), de-emphasis of final syllables.
 Verbs: longer, prosody carrying potential, word and phrasal forms, final syllables intact.⁵

In short, twinned nouns differ from twinned verbs in ways that suggest a difference in attention to phonological strength or emphasis in different parts of the respective forms: earlier for nouns, later for verbs. In addition, noun forms have a better potential subordinate status and verb forms provide a better prosodic base. In our final sections we will draw these observations together by hypothesizing an elemental difference: that nouns and verbs (when the difference is relevant) are constructed out of only partially overlapping prosodic elements, and that it is the elements which are special to each form which determine the kinds of detail we see in (9).

Morphological conversion. The data we have looked at might lead a reader to conclude that what we are dealing with here is morphological conversion, that is, the multiple use of a lexeme in different major categories without corresponding category marking. The classic examples involve absolute phonetic identity in all uses (inflectional alternations not counted).

The phonetic identity criterion, however, is not absolute. Lieber 1981 used the early metrical work of Liberman and Prince 1977 to argue that noun-verb twins differing only by stress placement, as in (2), should also be viewed as examples of morphological conversion, the phonological difference being accounted for by rhythmic principles (Lieber 1981:132-4). Lieber's argument allows us to turn a nice phrase: most derivational morphology concerns **word forming** (formation); morphological conversion, in cases of near rather than total phonetic identity (what we have been calling twinning), concerns **word shaping**.

The difference between these components can be made plain if we consider the range of means in morphology for correlating differences of form with differences of category. There is at one extreme simple suppletion: no correlation of differences, merely the fact of difference. Of course, the arbitrariness of form that suppletion implies is tempered somewhat by unconscious systematicities, as has been shown by analyses like Cooper and Ross's "World Order" (1975) and Ross's later work on pairing, ordering, and sounding. At the other extreme is "absolute" morphological conversion, the criterion case for multiple use of a form. Here we might say that with the lack of difference in form can come an arbitrariness of direction: "source category" would have only notional, not formal, importance. Lying between these extremes are morphology, which I place nearer to suppletion, and

twinning, which I place nearer to "absolute" conversion. What distinguishes them is their role in formal part-whole relations: classical morphology, with its concatenations, groupings, fixings, is exactly the study of word-formation, of forming words out of parts of words. Consider now the title of this paper. The data discussed here all obey the formal constraint posed there. I suggest that the lack of added syllables and the categorizing effects that we have observed are one and the same fact. Even in those cases where it necessary to propose suffixal morphemes (see fn 3), the categorization continued as long as the syllable limit was held to. We might thus view normal syllabic morphology as providing a kind of "syllabic shell" around morphemic material with which it combines in word formation. When that shell is lacking, then other influences, not morphemic in nature, can play a shaping role on the words in question.

Explanatory possibilities. The complementarity of form that twinning produces suggests two basic approaches to explanation. On the one hand, we may view it as an example of *complementary contextualizations*, that is, where a candidate twin will be treated (or shaped) differently according to some factors of context. If in our case of verbs and nouns, verbs and nouns appear in consistently different contexts, forms susceptible to effects of context will likely show these effects. What is needed, of course, is a clear delineation of the respective contexts and a statement of their role in shaping differing forms. Contextual approaches have dominated analytical thinking in recent years, particularly those of the structural-derivational schools and those of the rhythmic-hierarchical school.

The other basic approach involves *complementary prototypes of form*, where a candidate twin varies in form as it matches the requirements of a basic formal pattern. While this approach will be favored here, it should be obvious that it will have to interact with contextual approaches, if only for the fine surface detail that they can provide.

Let us begin a summary comparison of these approaches by considering the largest class of twins, those involving stress shifts. In their discussion of *import*, etc. Chomsky and Halle derived the noun from the verb through appropriate bracketing and the operation of the phonological cycle. A contrasting analysis is due to Liberman and Prince (1977) in which neither noun nor verb is the derivational source for the other. Instead, they are phonologically identical in their underlying representation, the stress differences being a late addition, a part of what Lieber (p 134) calls "productive phonology."

Lieber never spells out what "productive phonology" is, but we can use the phrase to denote exactly the two approaches to twinning that we have isolated. Productive phonology can be the phonology of the interaction of a candidate twin and its phonological context, or the phonology of the matching of a candidate twin with its target form. How different, for example, is the phonological context of the typical verb from that of the typical noun, and what features of that context allow just those attributes of verbs we saw in (9): longer forms, final syllables intact (not reduced, destressed, or lost), prosody carrying potential? One observation we can make is that verbs have, far more than nouns do, phonological material abutting their final syllables, through inflections, clitics, and objects. I know of no case where the adjunction of phonological material promotes the retreat of stress from the site of adjunction; the rightward abutment of verbal adjuncts may thus promote the emphasis on integrity of the ends of verb twins.⁶

A similar argument for contextualized placement of stress in noun twins can be made if the phonological material at the front of nouns is considered: cliticized articles and other modifiers might promote the leftward placement of stress.⁷ The question naturally arises as to whether the other attributes of

differentiate them: nouns, with forestress, would in their $\acute{ } \grave{ }$ pattern be emphasizing intensity differences between their syllables, while verbs would be emphasizing duration differences.

For other aspects of the twinning process correlative interpretations can be made. Truncations may be favored for nouns because final syllables are **already** in a reduced form through their diminished intensity status. The telescoped nouns in (3) may be telescope-able just because of the compaction possibilities of duration-independent trochees. Finally, the compaction may be shown to be an elementary prosodic subordinating device, or, in short, an important word-forming process in English.

Footnotes

*I would like to thank Rich Rhodes and Pete Becker for support, encouragement and discussion.

¹In the early 1970's this last feature of twinning would have been called a "conspiracy," an occasion when a group of linguistic tendencies could be seen to have parallel teleologies. Because the term has fallen into disuse I will forgo using it here. Readers interested in the idea should consult Kisseberth 1970, Pyle 1974 and Ross 1973.

²Adjectives in *-ate* also participate in these alternations: *precipitate*, *articulate*, *appropriate*, etc. I have chosen to ignore adjectives for this paper; all classes of twinning have either adjective-noun or adjective-verb twins, but except for examples in *-ate* they are few in number.

³It is of course the past participial *-t* which supplies the voicing contrast for most of (8).

⁴And possibly the vocalic change [i] - [e], though there seems to be little *independent* use of vowels for twinning: for tense/lax only *tell/tale* and *sell/sale* are extant; notice that the vowel lengths are wrong. The lack of vowel twins (despite the opportunities that Keller's figures suggest) lead one to the conclusion that there is more than mere length differences involved in the voicing examples. What may be of equal importance is the laryngealization of vowels before voiceless consonants, a kind of vocalic truncation.

⁵Because of our concern with twinning and its extensions, we haven't been able to use Ross's (1973) clear statement about stress and category:

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In English primary stress in nouns may be followed by a larger number of unstressed syllables than is the case for primary stress in verbs, and, similarly, stress may be retracted farther leftward in nouns than is possible in verbs; in other words, primary stress in English nouns is farther to the left than primary stress in English verbs.

p 168-9.

⁶In this regard, both verbal *-ate* and *-ment* require an extra syllable in past tense and past participial forms; it is this kind of restriction which (if in great enough numbers) would best drive contextual statements.

⁷Adjunction effects are grist for the structural-derivational mill; output from the Rhythm Rule (Hayes 1984) would be grist for the rhythmic-hierarchical mill: *Cornéll*, *Córnell hóckey*; *góod-lóoking*, *góod-looking life-guard*. Here it is the *modifying* word which is affected, not the head, certainly a shaping context for adjectives (*to excéss*, *éxcess bággage*).

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