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Authors	Siegel, Dorothy
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The Adjacency Constraint  
and the Theory of Morphology

Dorothy Siegel  
University of Toledo

I will assume here the theory of word based morphology (Aronoff (1976)). Within this theory, a word formation rule (WFR) is taken to be a special kind of transformation.<sup>1</sup> The structural description of a WFR specifies a major lexical category. The structural change wrought by a WFR is the Chomsky adjunction of an affix, producing a derived word which is a member of a major lexical category. In addition, I will assume that every affix is introduced by a particular boundary and that the only boundaries which introduce affixes are + and #.<sup>2</sup> Within this theory, a WFR which attaches a suffix is of the form shown in (1), and a WFR which attaches a prefix is of the form shown in (2), where X is a variable over major lexical categories, Y is an affix, and B is a boundary.<sup>3</sup>

$$(1) \begin{array}{c} [ \dots ] \rightarrow [ [ \dots B ] Y ] \\ \underline{X} \quad \underline{X} \quad \underline{X} \quad \underline{X} \quad \underline{X} \quad \underline{X} \end{array}$$

$$(2) \begin{array}{c} [ \dots ] \rightarrow [ Y [ B \dots ] ] \\ \underline{X} \quad \underline{X} \quad \underline{X} \quad \underline{X} \quad \underline{X} \quad \underline{X} \end{array}$$

The lexical items which are inputs to WFR's are referred to as bases.

WFR's generate both well formed and impossible words. It is often the case that an affix does not derive well formed words from all bases which are members of the particular major lexical category which is specified in the structural description of the WFR which introduces the affix. For example, the WFR for ity, stated in (3), says that ity derives nouns from adjectives.

$$(3) \begin{array}{c} [ \dots ] \rightarrow [ [ \dots + ] ity ] \\ A \quad A \quad NA \quad A \quad N \end{array}$$

However, ity may not appear on all adjectives; [weird+ity] is an impossible word. To block such words,

Aronoff (1976) stipulates that ity must be adjacent to a [+Lat] morpheme. Since weird is [-Lat], \*weirdity is

thrown out. On the other hand,  $[[[read+]<sup>V</sup>able+]<sup>A</sup>ity]<sup>N</sup> is not thrown out, even though it contains the  $[-Lat]$  morpheme read, since able, which is  $[+Lat]$ , is adjacent to ity.$

It is usually possible to identify a property P of a substring S of the base which is responsible for systematic gaps in the set of words derived by a WFR. I will henceforth refer to S which exhibits P as SP. It will be assumed, following Halle (1973), that filters throw out impossible words which are generated by WFR's. Some filters stipulate that SP be present in the bases of words derived in a particular affix. The ity filter is such a case; the base of a word derived in ity must contain a substring which has the property of being a  $[+Lat]$  morpheme. Other filters, as we will see below, prohibit the occurrence of SP in the bases of words derived in a particular affix. Minimally, then, a word filter mentions an affix A, specifies SP, and dictates whether SP must be present or absent.<sup>4</sup>

No constraint on the application of word filters has been proposed in the literature. At present, linguistic theory allows any imaginable relationship to obtain between A and SP in the string which a word filter scans. No constraint on the form of word filters has been suggested either. Below, I will propose a constraint which I claim governs both the application and the form of word filters.

Let us turn our attention to (4)-(6), which contain words in which the adjacent morphemes un and dis appear.

- (4)  $*[un[dis[honest]]]$   
 A A A  
 $*[un[dis[courteous]]]$   
 A A A  
 $*[un[dis[loyal]]]$   
 A A A
- (5)  $*[un[discrete]]$   
 A A  
 $*[un[dissonant]]$   
 A A  
 $*[un[distinct]]$   
 A A

- (6) [un[ [distract]ing]]  
 A A V  
 [un[ [distinguish]ed]]  
 A A V  
 [un[ [discover]able]]  
 A A V  
 [un[ [dismay]ed]]  
 A A V  
 [un[ [dispute]ed]]  
 A A V  
 [un[ [dis[hearten]]ed]]  
 A A V V

The grammaticality or ungrammaticality of particular words in undis may at first glance appear idiosyncratic. We will see, however, that the distribution of stars in (4)-(6) is systematic.

The words in (4)-(6) are generated by the un WFR, which is stated in (7).

- (7) [...] → [un[#...]]  
 A A A A AA

Let us consider how the words in (4) are filtered out. Since the words in (4) are derived by the application of both the un WFR and the dis WFR, we could block their derivation by ordering the un WFR before the dis WFR. However, this solution is unsatisfactory for three reasons. First, if the un WFR preceded the dis WFR, we would expect to find words having the structure shown in (8), and there are none.

- (8) [dis[un[...]]]  
 A A A

Second, this ordering solution fails to block the words in (5), for dis in these words is not introduced by a WFR within the theory of word based morphology. Third, this solution incorrectly blocks the derivation of undisheartened in (6).

As an alternative to the ordering solution, we might allow the words in (4) and (5) to be generated and then filter them out with the word filter (9).

- (9) Words in un are thrown out if the affix un is adjacent to the morpheme dis.

(9) is too powerful, however, for it incorrectly throws out the words in (6).

The solution to the undis problem lies in recognizing the syntactic difference between the words in (4) and (5), on the one hand, and the words in (6), on the other. In (4) and (5), the first cycle in which dis appears is the cycle adjacent to un. In other words, dis is uniquely contained in the cycle adjacent to un. However, in (6), the first cycle in which dis appears is not the cycle adjacent to un. An adjective cycle intervenes between un and the first cycle in which dis appears. Therefore, dis is not uniquely contained in the cycle adjacent to un in (6). Having made these observations, we may state the filter on words derived in un as (10).

- (10) Words in un are thrown out if the morpheme dis is uniquely contained in the cycle adjacent to un.

Other word filters which contain some version of the condition "if X is uniquely contained in the cycle adjacent to Y" have recently come to light (Allen (forthcoming), Dell and Selkirk (forthcoming)). Clearly, a generalization is being missed if this same condition shows up repeatedly in word filters. Instead of allowing particular filters to encode this condition, I propose that the Adjacency Constraint (AC), stated in (11), be adopted as a constraint on the application of word filters.

- (11) No word filter may involve A and SP unless SP is uniquely contained in the cycle adjacent to A.<sup>5</sup>

In view of (11), we may revise (10) as (12).

- (12) \*[un...dis...]  
A A'

The AC, functioning as a constraint on the application of word filters, constrains (12) such that (12) throws out only those undis words in which the ... to the left of dis contains only one bracket. Thus, (12) throws out



adjacent to al.

To make matters worse, the filter for words derived by the al WFR is not the only filter which violates the AC. In (16) are listed some good words in mentary, and in (17) are listed some impossible words in mentary.

- |      |   |   |
|------|---|---|
| (16) | [[ <u>testament+</u> ]ary]<br>N      A              | [[ <u>complement+</u> ]ary]<br>N      A             |
|      | [[ <u>document+</u> ]ary]<br>N      A               | [[ <u>sediment+</u> ]ary]<br>N      A               |
| (17) | *[[[ <u>employ#</u> ]ment+]ary]<br>V      N      A  | *[[[ <u>discern#</u> ]ment+]ary]<br>V      N      A |
|      | *[[[ <u>contain#</u> ]ment+]ary]<br>V      N      A | *[[[ <u>derange#</u> ]ment+]ary]<br>V      N      A |

The grammaticality of the words in (16) prevents us from having a filter which says that ary may not be adjacent to ment. The relevant filter is apparently the one stated in (18).

- (18) \* [ [ [ q#]ment+]ary ]  
          A  N  V  V      N  A

Again, the underlined portion of (18) mentions a string which is not uniquely contained in the cycle adjacent to ary, violating the AC construed as a constraint on the form of word filters. Moreover, the portions of the filters (15) and (18) which violate the AC are identical. Either this is an accident or a deeper principle accounts for the ungrammaticality of the words in (14) and (17).

One way out of this distressing state of affairs lies in the adoption of the Ordering Hypothesis (OH) (Siegel (1974)), stated in (19).

- (19) All WFR's which attach affixes introduced by + precede the cyclic stress assignment rules.  
      All WFR's which attach affixes introduced by # follow the cyclic stress assignment rules.

It follows from the OH that the attachment of all affixes introduced by + precedes the attachment of all affixes introduced by #. The OH, then, automatically excludes the impossible words in (14) and (17). In (14), the WFR attaching ment, an affix introduced by #, has applied before the WFR which attaches al, an affix

introduced by +. This violates the OH. Likewise, in (17), the WFR attaching ment has applied before the WFR attaching ary, an affix introduced by +, in violation of the OH. Thus, if we adopt the OH, we can dispense with filters (15) and (18).

The OH does more than merely block the derivation of the words in (14) and (17), permitting us to resurrect the AC as a constraint on the form of word filters. The OH has considerable explanatory force. A sampling of the facts which it explains is given in (20).

- (20) a. Affixes introduced by + may be stress determining, i.e. they may cause a shift in the position of stress in the bases they attach to: ancestor - ancestral.
- b. Affixes introduced by # are not stress determining: ancestor - ancestorless.
- c. Affixes introduced by + may themselves receive stress: nationality.
- d. Affixes introduced by # do not receive stress: nationlessness.
- e. Affixes introduced by + are found "inside" affixes introduced by #:  
 [[[center+]al#]ness].  
                   N   A   N
- f. Affixes introduced by # are not found "inside" affixes introduced by +:  
 \*[[[employ#]ment+]al].  
                   V      N   A

For a syntactic account of the facts in (20), see Selkirk (forthcoming), which has as one of its virtues the elimination of the boundaries # and +. The claim that there are no boundaries is independent of the claim that the AC constrains the form of word filters. For a discussion of why the ungrammatical words in (14) and (17) are not generated within Selkirk's framework, see Siegel (forthcoming b).

#### Footnotes

<sup>1</sup>For an alternative view, see Selkirk (forthcoming).

<sup>2</sup>Only those boundaries which are relevant to the



exposition will appear in the text.

For a treatment of word structure in which boundaries play no role, see Selkirk (forthcoming).

See Siegel (forthcoming a) for arguments against the = boundary.

<sup>3</sup>In the text, I will generally label only one member of a pair of brackets.

<sup>4</sup>Although many such filters have been proposed, to my knowledge no attempt has been made to delimit what P can be. P has been construed as a morphological feature (Aronoff (1976)), a particular morpheme (Allen (forthcoming), Siegel (forthcoming b)), stress (Siegel (1974)), segmental features (Ross (1972), Siegel (1971)), subcategorization properties of the base (Aronoff (1976), Siegel (1971)), and semantic features of the base (Aronoff (1976), Siegel (1971), Williams (1973)). The determination of what can constitute P in a word filter lies outside the scope of this paper. I mention this issue merely to indicate the impoverished state of morphological theory.

<sup>5</sup>The similarity between the AC and a portion of the Subadjacency Condition (Chomsky (1973)) has probably not escaped the astute reader. For a discussion of why the outputs of the syntax and the morphology are similarly constrained, see Siegel (forthcoming b).

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