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DAHL'S LAW AND PRIVATIVE
[VOICE]

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Recent work in phonology has been converging on the conclusion that [voice] is a privative feature, as first proposed by Mester and Itô (1989). The obvious apparent counterexample to privative [voice] is voicing assimilation, where it appears that both values of [voice] spread; Mester and Itô propose that the solution to this is to analyze voicing assimilation as a combination of neutralization and spreading. This suggestion has been taken up and elaborated by various authors including Cho (1990a,b), Lombardi (1991, to appear a), and Bethin (1992); and Lombardi (1991, to appear b) also presents arguments that it is only possible to have a consistent and explanatory analysis of laryngeal neutralization, the most common process involving the laryngeal features, if [voice] is privative.

Another apparent problem for the theory of privative voicing is Dahl's Law in Bantu. This process is usually described

This squib is a revision of part of my dissertation (Lombardi 1991); all thanks stated therein are applicable, but I would particularly like to acknowledge the assistance of John McCarthy with the analysis and David Odden with related data. Thanks also to the *LI* reviewers.

as dissimilation of voicelessness, which is impossible if there is no feature [-voice] to dissimilate. In this squib I will show that this phenomenon can be analyzed in a way that is consistent with privative voicing.

Dahl's Law in Bantu is well known as a historical process but also exists synchronically in Kikuyu (Armstrong 1967, Davy and Nurse 1982, Barlow 1960) and related languages. The consonant system of Kikuyu is given in (1).¹

| | | | | | | | |
|-----|----------|--------|----------|---------|---------|-------|---------|
| (1) | | | | Alveo- | | | |
| | Bilabial | Dental | Alveolar | palatal | Palatal | Velar | Glottal |
| | | | t | | | k | |
| | | | | c | | | |
| | mb | | nd | nj | | ng | |
| | β | θ | r | | | y | |
| | m | | n | | ɲ | ŋ | |
| | w | | | | y | | ɦ |

The facts are as follows. A velar-initial prefix will begin with [y] when the next syllable begins with a voiceless sound [θ, t, c, k]; it will begin with [k] when the next syllable begins with a voiced sound, including a vowel or sonorant (2a). Prefixes as well as roots condition the rule; as (2b) illustrates, a velar prefix disagrees in voicing with the initial of a following prefix. (2c) shows that it is the initial segment of the immediately next syllable, *not* the next consonant in the word, that conditions the rule, and (2d) that it is the surface syllabification that is crucial.

(2) a. (from Armstrong 1967)

| | |
|--------------|---------------|
| ko-ruya | yo-tejera |
| 'to cook' | 'to run' |
| ko-oria | yo-ciimba |
| 'to ask' | 'to hoe' |
| (koo.ria) | |
| ko-meña | yo-θeka |
| 'to know' | 'to laugh' |
| ko-fiota | yo-koora |
| 'to be able' | 'to root out' |
| ko-niina | |
| 'to finish' | |

¹ [ð] is the traditional transcription of the dental sound, but it behaves in all ways as voiceless, and I have transcribed it thus. Davy and Nurse (1982) claim that in fact the pronunciation of this sound was "in all contexts essentially voiceless" (p. 160) in the speakers they studied. Differences in vowel transcriptions in the various sources are retained, but I have changed Barlow's (1960) [g] to [y]. The surface realization of this sound as a fricative is the result of a late rule, since there is no stop/fricative contrast for obstruents in the language; this is the same assumption as is made by the traditional [-voice] dissimilation analysis.

- b. (from Barlow 1960)
 ka-mū-tī
 'small stick'
 ka-mū-ndū
 'small person'
 ya-ta-kaa-roma
 'the small thing that will not bite'
 ya-ta-yaa-ko-roma
 'the small thing that will not bite you'
- c. (from Armstrong 1967)
 ndo.kaa.ε.kwa.nde.ka
 'don't on my account write'
 ndo.kaa.ε.ko.heε.a.na
 'don't on any account give away'
 ndo.yaa.ke.ε.ko.rea
 'now whatever you do, don't eat'
- d. (from Davy and Nurse 1982)
 [kwee.a.θa]
 'to be free, wayward'
 varies with [yweea.θa]
 [a.ke.o.ki.n̩a]
 'and he trod on it'
 varies with [a.yeo.ki.n̩a]

The behavior of words with multiple velar prefixes is crucial to the correct analysis of this process. Some of the examples in (2) show the effect holding between two velar prefixes. But in (3) we see strings of multiple velar prefixes where the rightmost velar prefix disagrees in voicing with the first sound of the root, but all of the preceding prefixes are voiced. (Those that would be expected to be voiceless if an alternating pattern were maintained are in boldface.)

- (3) a. **y**e.ywee.ta ya.ya.ko.roma (Davy and Nurse)
 u.**y**i.ya.kinya u.**y**i.ya.θii (Barlow)

The generalization is that the effect holds between the *last* (rightmost) velar prefix in a sequence and the initial consonant of the next syllable. If the syllable following the string of velar prefixes begins with a voiceless sound, then all prefixes in the string are voiced (4a). If that syllable begins with a voiced sound, then the last velar prefix in the sequence is voiceless, and all previous velar prefixes in the string are voiced (4b).

- (4) a. two prefixes: ũ.yi.ya.θii
 three prefixes: ya.yaa.yii.kia
 b. two prefixes: . . . yaa.ko.roma
 three prefixes: ya.ya.ko.roma

I will now show that these facts can be analyzed as an effect of

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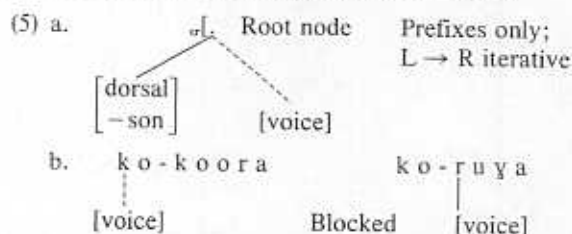
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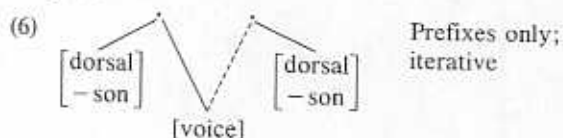
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the Obligatory Contour Principle (OCP) (Leben 1973, Goldsmith 1976, Mester 1986, McCarthy 1986) on [voice]; no mention of [-voice] is needed.

Assume that the velar prefixes are underlyingly unspecified for laryngeal features and that [voice] is privative. I propose that the language has a fill-in rule that voices velar prefixes (5a) and that the OCP rules out adjacent [voice] specifications linked to left edges of syllables. In the case of a word with a single prefix, this rule will fill in [voice] on the prefix. However, the rule is blocked when the initial of the root is voiced, since this would result in an OCP violation on [voice] (McCarthy 1986) (5b). (Irrelevant structure is repressed throughout.)



Since, despite the OCP, there can be a string of voiced velar-initial prefixes, it is clear that multiple linking is crucial to the analysis of this process. This can be accounted for by a rule of spreading (6).



The rule (5a) that voices velar prefixes fills in [voice]; the spreading rule then spreads [voice] to the right, to succeeding left edges of syllables. However, spreading stops if it would cause the OCP violation on [voice].

The behavior of sonorants and vowels in this process must be addressed. Sonorants and vowels are generally argued to be underspecified for [voice] since they do not contrast in this feature (see Mester and Itô 1989 and Lombardi 1991 for details and additional references). Yet these sounds do condition the OCP effect for Dahl's Law, acting as if they are phonologically voiced. However, recall that what is relevant to the rule is surface syllabification, with varying effects in fast speech (example (2d)). This shows that the rule affects a late representation, one in which we can reasonably assume that underspecified [voice] values for sonorants have already been filled in.² Thus, derivations proceed as follows:

² A reviewer suggests that the Elsewhere Condition would predict the opposite ordering of redundant [voice] fill-in and rule (5a), but the

sertion is postcyclic—various authors have suggested that redundant features are filled in postcyclically (e.g., Borowsky 1986, Booij and Rubach 1987), and Pulleyblank (1986) argues that Dahl's Law in Kikuyu applies on a noncyclic stratum—but it is not clear how this would solve the problem of the effect of speech rate. A likely solution would seem to be that the rule is actually restricted to applying within a prosodic domain. Compare for example Nespors and Vogel's (1986) argument that in Hungarian the phonological word includes stem and suffixes but does not include prefixes; possibly the phonological word in Kikuyu consists of stem and prefixes but not suffixes, and the rules are postlexical and apply only within a phonological word. In any case, these issues hold equally of the [-voice] account; the rule must still be sensitive both to speech rate and to morphological information (directly or indirectly) regardless of what feature value it is stated on.³

The other unusual feature in the structural description of the rule is its attention to only the initial sound of a syllable. But this restriction is equally necessary for the [-voice] account. For example, since this process must take place after redundant values of [voice] are filled in on sonorant consonants and vowels, it seems likely that [voice] must also be filled in on all the syllable-internal vowels as well. But these syllable-internal vowels do not count for the OCP effect; only those on the left edges of syllables are visible to the rule. However, the equivalent complication exists in the traditional analysis of this phenomenon as [-voice] dissimilation: since vowel-initial syllables interrupt dissimilation, that analysis also needs to be stated on left edges of syllables to explain why there is no dissimilation between the voiceless sounds in a sequence like [. . . kaa.e:ko . . .]. An analysis with [-voice] dissimilation could be made to work without reference to syllable-initials, but this would require two problematic assumptions:

1. The account must assume that the representations are marked only for [-voice] and not for [+voice]. This is a type

³ A point that may be of interest is that Davy and Nurse (1982) note that there are very few instances in these languages where sounds other than prefixes occur in the environment for the rule (less than 5% in their texts). One language, Gusii, does not restrict the process to prefixes.

A reviewer suggests that a problem for the assignment of this process to the postlexical level is that it also functions as a morpheme structure constraint; but there is no reason why the morpheme structure constraint cannot be a similar restriction holding at a different level. This seems correct particularly since the rule must refer to syllable-initials and the morpheme structure constraint does not and in fact could not since syllabification is not in the underlying representation of morphemes. Or if, as suggested, the rule can be restricted to a prosodic domain, this would likely also eliminate the problem (I thank Armin Mester for pointing this out).

of underspecification not attested in any other language, and it entails a reversal of the usual markedness relationship between voiced and voiceless obstruents. Privative voicing predicts that such reversals of markedness will not occur; since in all other cases this seems to be correct, this is a strong argument for analyzing Dahl's Law in a manner consistent with it.

2. Given the strong evidence for postlexical application of the rule, the [-voice] dissimilation account without reference to syllables must assume that [+voice] is still not filled in postlexically. This is inconsistent with the cross-linguistic evidence; see Lombardi 1991 for additional evidence for postlexical [voice] fill-in on sonorants.

In either a [-voice] or a privative [voice] analysis, then, stating the rule on syllable-edge segments allows us to maintain consistency with universal facts about feature specifications, and this seems preferable. (See also Odden 1994, which attempts to lay out a consistent theory of adjacency in phonological rules, in which Dahl's Law is stated with reference to syllables in a [-voice] account.) And both analyses require reference to a morphological or prosodic domain. Thus, the complications in the structural description of the rule are equal under both analyses and do not affect the argument about its melodic properties, which shows that it is possible to analyze Dahl's Law in a manner consistent with privative [voice].⁴

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⁴ Another reputed case of [-voice] dissimilation is Thurneysen's Law in Gothic. Flickinger (1981) argues that Thurneysen's Law does not in fact exist, and that all of the examples used as evidence for it are the result of Verner's Law. Other sources (e.g., Collinge 1985) retain the law and state it as a process of voicing an underlyingly voiceless fricative—an analysis consistent with privative [voice].

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