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Can [sonorant] Spread?¹

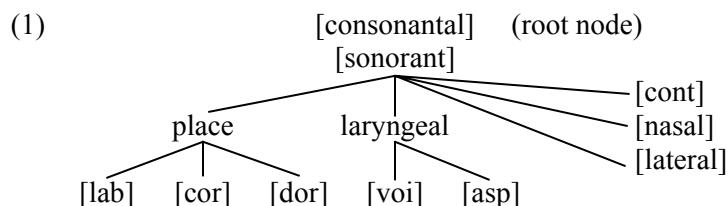
Kenneth S. Olson and Paul H. Schultz

This paper presents empirical evidence for the spread of the feature [sonorant], based on data from Bilaala (Nilo-Saharan, Chad). The analysis assumes that this feature is a dependent of the root node rather than part of the root node (as previously assumed). An alternative analysis, involving the spread of the feature [nasal], is shown to be inferior to one in which [sonorant] spreads.

1. Introduction

One of the primary goals of phonological theory is to account for the segmental processes that occur in natural language, such as assimilation, dissimilation, and reduction. The theory of feature geometry (Clements 1985, Sagey 1986) attempts to do this predominantly through its formalism. That is, through the use of a hierarchical representation of internal segmental structure, feature geometry predicts which distinctive features pattern together in phonological processes.

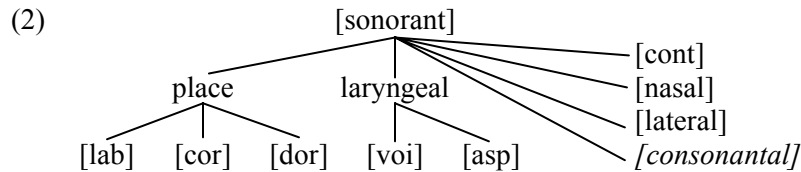
It is generally thought that the major class features, [consonantal] and [sonorant], do not participate in single-feature or partial assimilation. Rather, it is thought that cases in which these features assimilate are always cases of total assimilation. As a result, Schein & Steriade (1986:694) and McCarthy (1988:97) propose including [consonantal] and [sonorant] in the root node of the feature tree, such as shown in (1). This proposal has been incorporated into most models of feature geometry, including the presently received models of Clements & Hume 1995 and Halle 1995.



However, recent work casts doubt on the position of the feature [consonantal] within the feature tree.² Kaisse (1992) offers empirical evidence for the spread or dissimilation of [consonantal], independent of other features. She proposes a modification to the feature tree whereby [consonantal] is treated as a direct dependent of the root node to account for these cases, as shown in (2).

¹Thanks to Mike Cahill, Rod Casali, Bill Darden, John Goldsmith, Beth Hume, Karen Landahl, Joanna Lowenstein, Steve Marlett, David Odden, and Tami Wysocki for their comments and suggestions, and to Hassan Mahamat Souleyman for providing language data. We take responsibility for all errors. The first author presented an earlier version of this paper at the Linguistic Society of America annual meeting, Washington, D.C., January 2001.

²See Hume & Odden 1996 for arguments against the existence of the feature [consonantal].



Cho & Inkelas (1993) counter Kaisse's basic claim. They argue that alternations in major class features are a reflex of the assimilation or dissimilation of other features. In other words, another feature undergoes a process, and then a structural well-formedness constraint, either prosodic or segmental, forces a change in the value of the major class feature.

Throughout this debate, it has been assumed that the feature [sonorant] does not spread independently of other features. For example, Kaisse simply states, "I have thus far found no good examples where the major class feature [sonorant] spreads." (p. 315) The feature [sonorant] has consistently been placed at the root node in feature geometry models with no discussion of alternative locations.

In this paper, we present empirical evidence for the spread of the feature [sonorant]. This is to our knowledge the first clear case of such a process to be reported in the literature. The data come from Bilaala, a Nilo-Saharan language spoken in Chad.³ Treating the process as the spread of the feature [sonorant] leads to a straightforward solution. In addition, we will show why a solution that treats the alternation in the value of [sonorant] as the reflex of the spread of another feature is dispreferred.

2. The Bilaala data

At issue is the Bilaala third person singular suffix *-nə*, which functions as a possessive pronoun following nouns and as an object pronoun following verbs:

- (3)
- | | | | | |
|----|---------------|----------------|----------------|--------------------------|
| a. | <i>mon-nə</i> | | 'his child' | |
| | child-3SG | | | |
| b. | <i>ugu-nə</i> | | 'He hit him.' | |
| | hit-3SG | | | |
| c. | <i>ja</i> | <i>indi-nə</i> | <i>gord-ne</i> | 'He gave him the knife.' |
| | 3SG | give-3SG | knife-DET | |

Alternations of this suffix are shown in (4). Following obstruents, the palatal nasal *n* becomes an obstruent, as in (4a). That is, it agrees with the preceding segment in terms of the feature [sonorant]. In addition, it agrees in terms of the features [voice], [continuant], and [nasal] with the preceding segment in these cases. Crucially, the place features remain unchanged regardless of the changes in the manner features.

After nasals, liquids, semi-vowels, and vowels—in other words, the class of sonorants—the suffix does not alternate, as shown in (4b).

- (4) Alternations of *-nə* '3SG' suffix
- | | | |
|----|-----------------|--------------|
| a. | <i>got-tʃə</i> | 'his place' |
| | <i>dək-tʃə</i> | 'his wife' |
| | <i>bob-dʒə</i> | 'his father' |
| | <i>gɔrd-dʒə</i> | 'his knife' |

³Bilaala, also known as Naba, is classified by Grimes (2000) as Nilo-Saharan, Central Sudanic, West, Bongo-Bagirmi, Sara-Bagirmi, Bagirmi. It has about 140,000 speakers.

	<i>gag-dʒə</i>	‘his plant’
	<i>gurus-fə</i>	‘his money’ (loan from Arabic)
	<i>os-fə</i>	‘pour (water) on it’
	<i>kuz-ʒə</i>	‘his hut’ (loan from Arabic)
b.	<i>mon-nə</i>	‘his child’
	<i>naŋ-nə</i>	‘his children’
	<i>βer-nə</i>	‘his slave’
	<i>kuhul-nə</i>	‘his hip’
	<i>kaw-nə</i>	‘its length’
	<i>waj-nə</i>	‘his spear’
	<i>tʃe-nə</i>	‘his mother’
	<i>ugu-nə</i>	‘He hit him.’

The suffix exhibits variation if the root ends in a palatal glide *j*. For example, the word for ‘his spear’ in (4b) is realized as *waj-jə* in fast speech. We will ignore this variation and assume the invariant form for the purposes of this paper.

This process of assimilation does not occur with other pronouns. For example, the first person singular suffix *-mə* does not alternate:

(5) ‘1SG’ suffix

	<i>got-mə</i>	‘my place’
	<i>dok-mə</i>	‘my wife’
	<i>bob-mə</i>	‘my father’
	<i>gərd-mə</i>	‘my knife’
	<i>gag-mə</i>	‘my tree plant’
	<i>gurus-mə</i>	‘my money’
	<i>kuz-mə</i>	‘my hut’

However, there are no other cases in Bilaala where a palatal consonant is in the second position of a consonant cluster. If we stipulate that the second consonant is palatal in the rules we will discuss, then the process can be considered exceptionless.

We will make a couple of assumptions concerning the consonant system of Bilaala, which is shown in (6). First, we will treat the alveopalatal and palatal segments (*f, tʃ, dʒ, ndʒ, ʃ, ɲ, j*) as belonging to the single natural class *palatal*. Second, we consider the palatal affricates to be [–continuant], since they pattern as stops in the language.⁴

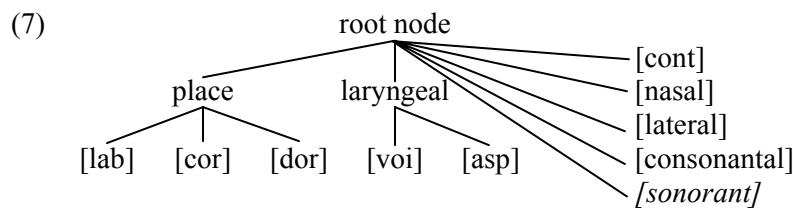
⁴ As is common in recent work in generative phonology, we do not employ the feature [del. rel.].

(6) Bilaala consonant phonemes

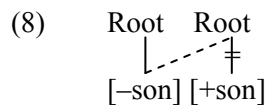
<i>b</i>	<i>d</i>	<i>f</i>		
(<i>p</i>)	<i>t</i>	<i>tf</i>	<i>k</i>	<i>ʔ</i>
<i>b</i>	<i>d</i>	<i>dʒ</i>	<i>g</i>	
<i>mb</i>	<i>nd</i>	<i>ndʒ</i>	<i>ng</i>	
<i>f</i>	<i>s</i>	<i>ʃ</i>		<i>h</i>
	<i>z</i>			
<i>m</i>	<i>n</i>	<i>ɲ</i>	<i>ŋ</i>	
	<i>r</i>			
(<i>w</i>)	<i>l</i>	<i>j</i>		

3. Feature geometric solution: the spread of [sonorant]

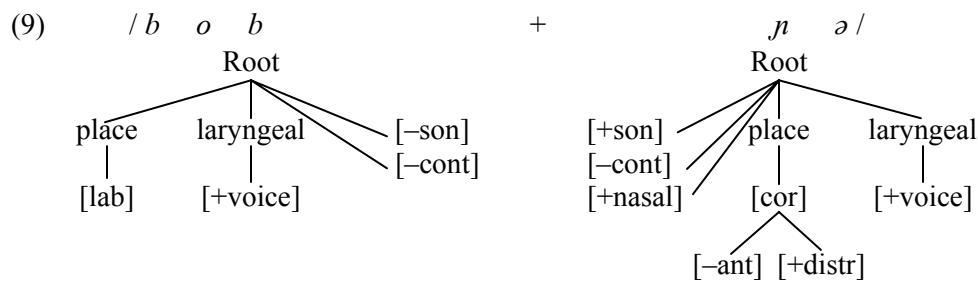
The feature geometric solution that we present considers the feature [sonorant] to be a dependent of the root node rather than a part of the root node. Thus, we modify the general feature tree as shown in (7).



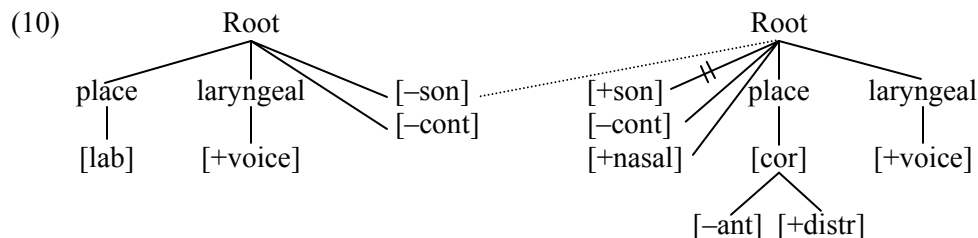
Given this position of the feature [sonorant], we can formalize a structure-changing rule involving the spread of [-sonorant]:



Since we are interested in the alternation of [sonorant], we will examine in detail an example that does not involve alternations of the features [voice] or [continuant]. Consider the root *bob* ‘father’. When the third person singular suffix is applied, we get the following feature tree representation:



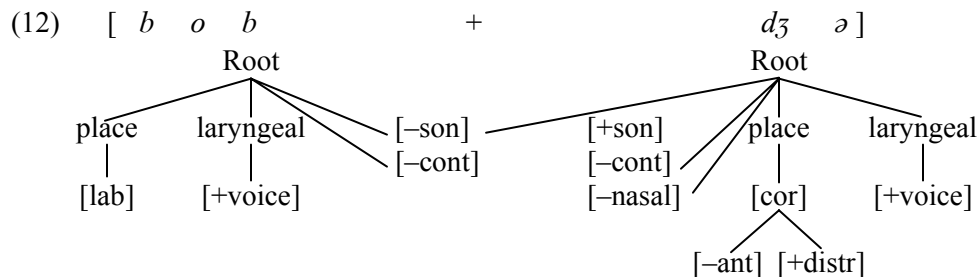
The structural description of rule (8) is met, and so it applies yielding (10).



The resulting initial segment of the suffix is a nasal obstruent, which violates structure preservation in Bilaala (Kiparsky 1985). We thus posit the implicational constraint in (11), which forces the nasal obstruent to become [-nasal]. Alternatively, this could be formalized as the delinking of [nasal], if one considers [nasal] a privative rather than an equipollent feature:

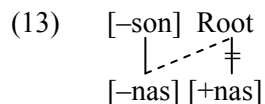
- (11) Bilaala implicational constraint
 [-son] → [-nas]

This constraint not only enforces structure preservation in Bilaala, it could be considered a universal, since it reflects the cross-linguistic tendency for obstruents to be nonnasal. This results in the well-formed structure found in (12), in which the palatal nasal has become a voiced palatal affricate.



4. Alternative solution: spread of [nasal]

One could attempt to salvage the claim that [sonorant] is part of the root node by offering a solution to the Bilaala problem in which it is the feature [nasal] that spreads rather than [sonorant], and positing an implicational constraint that forces a change in the value of [sonorant] from plus to minus. The rule and constraint for this solution are given in (13) and (14), respectively.



- (14) [-nas, -approx, +cons] → [-son]

This solution is beset by several difficulties. First, the structural description of rule (13) must make reference to the feature [-sonorant] in order to account for the correct output forms. If [-sonorant] were

⁵This assumes that prenasalized stops are not “nasal obstruents.” Some early generative accounts represented prenasalized stops by the feature combination [+nasal, -sonorant], but more recent accounts have made use of autosegmental notation. See Hubbard 1995:236.

not present, then the palatal nasal would become a nonnasal after any nonnasal consonant or vowel. Thus, rule (8) is formally simpler than rule (13). But this also implies that it is the obstruency of the preceding segment that triggers the spreading rule rather than its lack of nasality. A common characteristic of an assimilation rule is that the feature specification of the structural change reflects the feature specification of the conditioning context. Rule (8) captures this point, whereas rule (13) does not.

Second, rule (13) makes reference to the feature specification [-nasal]. This solution would not be available to us if the feature [nasal] were considered to be privative, an assumption that is commonly made in feature geometry because of the observation that processes involving the assimilation or dissimilation of [-nasal] are rarely, if ever, attested.

5. Conclusion

We have shown one case in which the feature [sonorant] spreads. In order to account for the Bilaala data in the most straightforward manner, it is necessary to remove [sonorant] from the root node of the feature tree.

Some may argue that the added complexity of the [nasal] spreading solution is not sufficient reason to require the modification in the feature tree suggested here—that perhaps it would be preferable to maintain a more constrained version of feature geometry rather than to adjust the theory to account for the Bilaala data. Additional examples of the independent behavior of [sonorant] in the world’s languages would bolster the basic claim of this paper. McCarthy (1988) has pointed out that three lines of evidence argue for the grouping together of features: assimilation, dissimilation, and reduction of features. The Bilaala data provide an example of assimilation. Evidence of dissimilation from the world’s languages would reinforce the motivation to remove [sonorant] from the root node. Reduction likely cannot be used as an argument, since [sonorant] does not have any dependents in our model, and since [sonorant] is generally considered to be equipollent rather than privative.

Look again at the revised feature tree in example (7). One favorable consequence of removing [sonorant] and [consonantal] from the root node is that the root node becomes devoid of distinctive features, resulting in a more coherent theory. In the theoretical development of the feature tree, the root node has usually been the only one claimed to contain features. The other organizing nodes in the feature tree dominate features, but do not contain them. If the root node is also devoid of features, as suggested here, it becomes akin to the class nodes and the theory becomes more internally consistent.

The spread of [sonorant], then, appears to be a rare phenomenon. This is not a problem for our proposed revision of the feature tree, since the responsibility of a formal theory is to predict what is possible, while notions of markedness or functional explanations can be employed to account for its rarity. Of course, its rarity may not be typological at all. Since only a small percentage of the world’s languages have been described at present, it is certainly conceivable that additional examples of the spread of [sonorant] are out there lurking, waiting to be found.

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⁶ Concerning [consonantal], Kaisse (1992:315) states, “Reduction cannot be used as an argument in the case at hand, since I am not arguing that [consonantal] has any dependents. Furthermore, although a placeless segment could plausibly exist (*h* is often so analyzed, for instance), a segment with no specification for consonantality one way or the other, as would result from reduction of [consonantal], is much harder to imagine.”

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