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William Evert Welmers was born on April 4, 1916 in Orange City, Iowa. He grew up in Holland, Michigan, where he attended primary and secondary school and eventually Hope College, from which he graduated *summa cum laude* in 1935 with a degree in Philosophy. From 1936-1939, he attended Westminster Theological Seminary in Philadelphia, receiving the ThB and the ThM in Old Testament and Semitics. From an early age, Bill loved the study and analysis of languages, an interest instilled in him by his father, who was a Professor of Greek at Hope College. He entered the University of Pennsylvania in 1939 with the intention of continuing the study of languages of the Ancient Near East, but the need for specialists in "exotic" languages during the war years drew him into African languages. His dissertation, completed in 1943 under the supervision of Zellig Harris, was "A Descriptive Grammar of Fanti" (for which the principal consultant was a Ghanaian student, Kwame Nkrumah).

Following completion of the PhD, Bill remained at Penn as an Instructor, supervising courses in Chinese and Japanese for the Army Specialized Training Program as well as working as a consultant on a Dictionary of Spoken Chinese. During this period, he also served as Pastor of the Knox Orthodox Presbyterian Church, a denomination in which he was an ordained minister and was an active member throughout his life.

The course of the remainder of Bill's academic life was set when he went to Liberia in 1946 with his wife Beatrice, whom he had married in 1940, to do linguistic research for the Lutheran Mission in Liberia. He spent a total of three years in Liberia, from 1946-1948 and again from 1954-1955, working principally on Kpelle. As a Fellow of the American Council of Learned Societies from 1948-1950, he traversed the African continent from West to East, doing linguistic research on a large number of languages in what is now Ivory Coast, Ghana, Nigeria, and Ethiopia. From 1950-1954 he was Assistant, then Associate Professor of Linguistics at Cornell University. After another year in Liberia in 1954-1955, he returned to the US to become Associate Professor of Linguistics at the Kennedy School of Missions, at the Hartford Seminary Foundation.

He came to UCLA in 1960 as Professor of African Languages in the Near Eastern Languages Department. He moved to the newly formed Department of Linguistics in 1966 as Professor of African Languages and Linguistics, where he remained until his retirement in 1982. Following his retirement, he and Bee moved to Lakeview, Arkansas, where he passed away on March 5, 1988.

Throughout his academic career, Bill Welmers remained the preeminent American scholar in the description and teaching of African languages. Few scholars have or will surpass him in breadth of knowledge of African languages. The culmination of his linguistic research is his *African Language Structures* (UC Press, 1973), which reveals both the range of his linguistic interests (with chapters on classification, phonology, tonology, morphology, and various areas of syntax) and the range of language data he controlled (the language index lists over 130 individual languages, half or more of which he personally worked on). Bill was interested in all phenomena in all African languages, but perhaps his greatest contribution to
general linguistics was in tone. He was writing and publishing on tone in African languages long before it was a fashionable topic in linguistics, and the detail and accuracy of his tonal descriptions in languages such as Kpelle, Igbo, Efik, and Jukun will remain a permanent legacy to linguistics.

Bill was also a tireless language teacher throughout his career, beginning at Penn during the war. Those of us who studied with him will remember him as a language teacher who was willing to give a class on any African language, and he not infrequently was teaching as many as three languages during the same year. He probably taught as many as ten African languages at one time or another, but his main specialities were Yoruba, Efik, and Igbo. He published pedagogical materials on the latter two. His Igbo Learner's Dictionary and Igbo Learner's Manual, co-authored with Bee, are still in demand.

In 1972, a serious illness brought an extremely productive period in the late 60's and early 70's to a halt, but two years later Bill had recovered sufficiently to be able to make his last field trips to Africa, when he visited Sierra Leone and Liberia in 1974 and 1975 to do research on Vai. His last major publication was A Grammar of Vai, based on this field work. In a sense this work completes a circle in that Vai, like Kpelle, is a Man- de language spoken in Liberia. And it is a book in the Welmers tradition: clear in exposition, attentive to descriptive detail, and photo-offset from a manuscript prepared by Bill himself on a manual typewriter which he had been using for perhaps twenty years.

A nearly complete list of Bill Welmers' publications can be found in Papers in African Linguistics in Honor of Wm. E. Welmers (Studies in African Linguistics, Supplement 6, 1976), a festschrift edited by several of his former students on the occasion of his 60th birthday.

Russell G. Schuh
PHONOLOGICAL ALLOMORPHY IN SWAHILI:
ON THE FORM OF INANIMATE PRONOMINAL CLITICS*

Camillia N. Barrett-Keach
Temple University

Swahili has two forms of inanimate pronominal clitics, one, like the relative pronouns, typically ends with /o/ and the other, like the subject agreement affixes, are never /o/ final. According to the traditionalists, a semantic feature associated with /o/ differentiates two sets of clitics semantically as well as phonetically. The present account argues that the two sets do not form separate morphemes. They are instead allomorphs of the same morpheme derived by a phonological rule, 0 Epenthesis, which suffixes /o/ onto any constituent final pronominal clitic. This virtually exceptionless account provides synchronic evidence for a dual constituent analysis of the verbal complex. The discussion of such well known forms adopts basic assumptions from lexical and autosegmental phonology.

1. Introduction

Descriptions of word formation processes typically rely on a characterization of the morpheme as the smallest meaningful unit in a given language. Although it is well known that such a semantically based description too narrowly delimits the elements of word construction in language, the definition persists in many descriptive works. This paper redresses a misconception found frequently in traditional texts and in much current research in

*This paper is a substantial revision of a paper given at the Fifteenth Conference on African Linguistics. I am grateful to the participants at that conference for their comments. Whatever merit this paper has is largely due to Jill Carrier-Duncan for her generous assistance in helping to clarify for me the issues involved. I also thank Morris Halle for his helpful suggestions. To my primary informants, Sheikh Yahya Omar, Samira Fakih, and Khalfan Kasu, I owe a special thanks. All errors I accept as my own.
Swahili: the relationship between two sets of pronominal clitics, exemplified by ki and cho. Here I will propose that forms like ki and cho, long assumed to be semantically distinct, are in fact allomorphs, related by a set of purely phonological rules.

As we shall see, there are few exceptions to this analysis of the strictly delimited pronominal clitics in Swahili (but see section five). If successful, the analysis here is indebted to recent innovations in two theoretical frameworks. This accomplishment is possible once we adopt certain basic assumptions from lexical and autosegmental phonology. Certain aspects of this proposal will suggest further analytical consequences for Swahili based inquiries. And, like this study, additional research in Swahili will further validate or indicate modifications for the frameworks.

1.1. Swahili pronominal clitics. Typical of Bantu languages, Swahili exemplifies a rich network of agreement morphemes whereby a pronominal clitic (PCL) noun class agrees with some NP position in the sentence. Two PCL's occur in the amba relative clause constructions in (1). The subject prefix (SP) is affixed onto the verb, and the relative PCL, agreeing with the relativized subject is suffixed onto amba, a complementizer-like word.

(1) a. mtu amba-ye a-ta-faa¹ 'the person who will do'
   person REL SP-FUT-suffice
b. watu amba-o wa-ta-faa 'people who will do'
   people REL SP-FUT-suffice
c. kisu amba-cho ki-ta-faa 'the knife which will do'
   knife REL SP-FUT-suffice
d. visu amba-vyo vi-ta-faa 'knives which will do'
   knives REL SP-FUT-suffice
e. miti ambayo itafaa 'trees which will do'

Consider the form of the relative pronouns in (1). Except for the singular human class relative pronoun in (la), all of the relative pronouns are o-final. On the other hand, all of the SP's are o-less. We might

¹There are no definite articles per se in Swahili. The glosses here are suggestive rather than exact.
ask why Swahili has the two sets of PCL's listed below in (2) at all.

(2) PCL

<table>
<thead>
<tr>
<th>o-less</th>
<th>o-form</th>
</tr>
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<tbody>
<tr>
<td>u</td>
<td>o</td>
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<tr>
<td>i</td>
<td>yo</td>
</tr>
<tr>
<td>zi</td>
<td>zo</td>
</tr>
<tr>
<td>ki</td>
<td>cho</td>
</tr>
<tr>
<td>vi</td>
<td>vyo</td>
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<tr>
<td>li</td>
<td>lo</td>
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<tr>
<td>ya</td>
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<td>pa</td>
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</tr>
<tr>
<td>ku</td>
<td>ko</td>
</tr>
<tr>
<td>mu</td>
<td>mo</td>
</tr>
</tbody>
</table>

The traditional position assumes that /o/ augments the meaning of the o-less PCL. However, this characterization masks a predictable distributional pattern and imposes an unwarranted semantic burden on /o/. By making the opposite assumption, that /o/ has no semantic content, a very straightforward generalization emerges. When a PCL ends a word, an /o/ occurs, but elsewhere the PCL is o-less. So, in (1) the amba-final relative pronouns are o-form PCL's, whereas the word initial SP's in (1) are o-less PCL's. Viewed in this way, the position, not the meaning, of the PCL accounts for its form. In a positional analysis, then, ki and cho are variants of the same morpheme, and /o/ contributes absolutely no semantic information.

Yet the relative pronoun is not the only o-form PCL in Swahili. Indeed, the motivation for the positional account is overwhelming. Section two presents the positional analysis and closes with a brief survey of the environments where o-less and o-form PCL's are found. The traditional account, the one generally adopted by contemporary Swahili scholars, is the subject of section three. Section four includes analyses of three apparent counterexamples. The conclusion in section five presents specific questions raised by this analysis for Lexical Phonology.
Before moving on to those sections, a caveat is in order. Throughout this discussion, the term PCL will designate the class of non-nominal inflectional affixes associated with the inanimate classes, or, stated differently, the inanimate subset of Welmer's [1973] secondary concords. These are the affixes listed in (2). While limiting the scope of the analysis to a smaller set of pronominal clitics, this stipulation nonetheless brings a wide range of data under scrutiny. Moreover, the distinction is a natural one reflecting a well-documented contrast arising quite often in both morphology and in phonology. With this in mind, we can proceed to a discussion of the phonological rules which account for the form of the PCL's.

1.2. Assumptions. Recent work from Kiparsky [1983], Mohanan and Mohanan [1984] and Halle and Mohanan [1985] develops the framework of lexical phonology which organizes the lexicon into ordered levels where each morphological process is confined to a specific stratum or level. Phonological rules interact with the strata of the morphology in that phonological rules are assigned to specific levels as their domain. The output of the morphological and phonological operations at a given level may provide the input for subsequent levels.

Certainly extensive inquiry is needed to provide a more precise characterization of the morphological and phonological operations at each stratum and the number of strata in Swahili. The present discussion ignores these broad issues and assumes that PCL Affixation takes place independently of other morphological operations despite the fact that certain immediate problems result for Lexical Phonology. Those problems are raised in section 5. We turn now to the proposal.

2. The Positional Analysis

2.1. A phonological proposal. I propose that the form of the underived PCL is identical to that of the SP, repeated here in (3). I adopt the double square brackets [[ ]] to indicate the beginning and end of word level constituents [Halle and Mohanan 1985]. I assume such brackets enclose word-level morphemes and that quadruple brackets surround a word.
Crucially PCL's surface in this form in constituent non-final position.
In constituent final position, they emerge with a [-hi] vowel as their nuclei. The phonological rules below will alter the shape of (3) producing one of three forms: C, [V, V, or simply C
[-voc] [-voc]

(4) O Epenthesis
  ⌀ → o / C ⌀ V ]]]

(5) Merging Rules
  i. Glide Formation
  V → [+syl -hi ] / [+hi +bk ]
     <+bk> a [ -cons ] / ___ [ +hi ]
     <+lo> b

  condition: a → b

  ii. Palatalization
  k + ch / ___ y

2The condition in (5) allows the rule to convert a PCL with a back vowel nucleus into a glide only when it is followed by a low vowel. Written with the condition, (5) correctly accounts for forms like the possessive and corresponding /o/ form PCL's given below:

(i) mwa = [ mu + a ] *mwo = [ mu + o ] mo
    kwa = [ ku + a ] *kwo = [ ku + o ] ko
    vya = [ vi + a ] vyo = [ vi + o ] *vo
iii. Glide Deletion

\[ y \rightarrow \emptyset / \, [\text{C}] \, [+\text{cor}] \]

iv. Lowering

\[ i \rightarrow \varepsilon / \, [\text{V}] \, [+lo] \, [+bk] \]

v. Vowel Deletion

\[ V \rightarrow \emptyset / \, [\text{V}] \]

I have chosen to insert rather than to delete /0/ because insertion allows the (4) and (5) to remain unordered. If /0/ were underlying and deleted initially, a rule of 0 Deletion must be ordered before the Merging Rules in (5). Without this ordering stipulation, the system of rules would produce unacceptable forms like *cholitosha. On the other hand, 0 Epenthesis requires no ordering stipulation.

Although the rules in (5) merely sketch the kind of phonological operations to which the PCL's are subject, they require a few comments. First, the two sets of double brackets in 0 Epenthesis will indicate constituent final position. Recall that a PCL will be enclosed in its own set of double brackets, and in addition, its host constituent will contribute another set. 0 Epenthesis applies when those two sets of brackets follow the PCL. This perhaps unorthodox use of the bracketing actually translates the SPE word boundary into the Lexical Phonology framework. Secondly, (5i) through (5iii) express the fact that PCL's like [k1] and [ku] behave differently depending upon whether they are adjacent to /o/ or /a/, as explained in footnote 2. Finally, 0 Epenthesis will generally feed the Merging Rule in (5i) since it introduces a [-hi] vowel. We will see directly that almost any such vowel will trigger Glide Formation.

Let us now consider the derivation for the two cases from section one. First \[ [[[k1]][[i]][[[tosha]]]]^3 \] 'it was enough' has the following der-

---

^3This bracketing will be revised in section 4.3. That revision will not alter the derivations in (7) and (8).
Phonological Allomorphy in Swahili

ivation:

(6) [[ [[ki]] [[litosha]] ]]  

(the rest of the form need not concern us here)

where no rule applies because ki is constituent initial and the adjacent segment is not a [-hi] vowel.

On the other hand, the A tense morpheme, described in Ashton [1966] as the present indefinite tense, is a [-hi] vowel and will trigger the Merging Rules.

(7) a. ki a tosha
    ky a tosha (5i)
    ch y a tosha (5ii)
    ch a tosha (5iii)

b. i a tosha
   y a tosha (5i)

In the amba cases where the PCL's occur word finally, we begin with the form produced by the Affixation rules. 0 Epenthesis applies followed by the relevant Merging Rule.

(8) a. i. [[ [[amba]] [[ki]] ]]
   ii. amba kī o (4)
   iii. amba ky o (5i)
   iv. amba ch y o (5ii)
   v. amba ch y o (5iii)

b. i. [[ [[amba]] [[i]] ]]
   ii. amba li o (4)
   iii. amba l o (5v)

c. i. [[ [[amba]] [[I]] ]]
   ii. amba l o (4)
   iii. amba y o (5i)

It is appropriate to conclude this section with a description of the cases subject to the analysis presented here. Perhaps the most obvious, if
not famous, characteristic of Swahili is its rich inflectional morphology which allows almost any lexical category to accept a PCL as an affix. For the sake of brevity, then, I will omit irrelevant, albeit interesting, details about each form cited below and restrict my remarks to pertinent phonological information about each form. And so, this brief survey will generally exclude unrelated traits associated with each form like range of meanings, subcategorization, categorial affiliation, and the like. For a fuller description, I refer the interested reader to the Swahili language texts cited in the references.

2.2. **Inventory of Swahili PCL's**

2.2.1. **Word initial PCL's.** Word initial PCL's include the following:

**The Far Demonstrative:** \[\text{PCL} \text{le} \]

(9) a. kitabu vilé 'that book'
    b. mahali pale 'that place'

**The Interrogative -pi:** \[\text{PCL} \text{pi} \]

(10) a. kitabu kipi? 'which book'
    b. jicho lipi? 'which eye'
    c. nyumba zipli? 'which houses'

None of the phonological rules apply in (9-10) because the PCL is constituent initial and doesn't precede a [-hi] vowel.

**The Possessive:** \[\text{PCL} \text{possessive stem} \]

(11)       singular           plural
    PCL \{ angu PCL \{ etu 1st
        ako PCL \{ enu 2nd
        ake       \{ ao 3rd

Our proposal predicts that the Merging Rules will apply since all of the stem initial vowels are [-hi], and they do, producing

(12) a. kitabu changu 'my book'
    b. vitabu vyangu 'my books'
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-enyewe 'self'; -enye 'having': [[[[PCL]] [[X]] ]]

Of course, these forms represent distinct words. I have included both forms in one section because their stem initial vowels are [-hi]. As in the previous cases, they will trigger the Merging Rules when a PCL is prefixed.

(13) a. kitabu chenyewe 'the book itself'
     b. dirisha lenyewe 'the window itself'
     c. nyumba yenyewe 'the house itself'
     d. nyumba yenye madirisha 'house with windows'

-Ingine 'another, other': [[[[PCL]] [ingine]]]

Sometimes a nominal concord (a non-PCL, as defined here) is prefixed onto this stem. Just as acceptable, however, are the PCL prefixes illustrated in the examples below.

(14) a. kitabu kingine 'another book'
     b. nyumba zingine 'other houses'
     c. yal lingine 'another egg'
     d. mahali pengine 'another place' (5iv)

2.2.2. Word Final PCL’s. In this subsection, I will present eight cases of PCL final constituents. As predicted, all occurrences of word final PCL's emerge with /o/ as their nuclei.

[[[[kwa]] [[PCL]]]]

The preposition kwa may be followed by a lexical NP. When no NP follows, a PCL is suffixed onto kwa.

(15) a. kata nyama kwa kisu
     'cut the meat with a knife'
     b. kata nyama kwacho
     'cut the meat with-it'
c. *kata nyama kwaki

(16) ataweza kusallmika na ile aibu waliyomtia he will be able to escape from the stigma which they put him

\{ *kwai \}

chapa \{ kwayo \}? brand with-it

'will he be able to escape the stigma with which they have branded him?'

In (16) the object of the preposition, kwai, is relativized, and two o-form PCL's occur in the sentence: one, the relative pronoun internal to the verbal complex, and the other attached to kwai.

[[ [[na]] [[PCL]] ]]

The preposition na has a variety of uses and translations. In all of them, na may be followed by a lexical NP. But if no lexical NP follows, an /o/ final PCL is suffixed onto na.

(17) a. karatasi zile, angalia ufikeye nazo papers those take care that you arrive with-them 'see that you arrive with those papers'

*karatasi zile, angalia ufikeye nazi.

b. kalamu hii, nimeweza kuandika nayo pencil this I am able to write with-it 'I am able to write with this pencil'

*kalamu hii, nimeweza kuandika nai

kuwa and Locative Noun Phrases: [[ [[X]] [[PCL]] ]]

The copula kuwa occurs with adjectival and NP complements. When kuwa has a locative NP complement, an /o/ final PCL may cooccur with the locative. Furthermore, there are sentences where there is no lexical locative NP, and an o-form PCL is suffixed onto kuwa.

(18) a. nitakuwa hapa kesho 'I will be here tomorrow'
b. nitakuwapo hapa kesho
   'I will be here tomorrow'

c. nitakuwapo kesho
   'I will be here tomorrow'

d. *nitakuwapa kesho

The Present Tense Copula: [[[[PCL]]][[PCL]]]]

When the complement is a locative NP, the "verb" is a combined form, SP + o-form PCL.

(19) a. kisu kiko mezani
    'the knife is on the table'

b. *kisu kiku mezani

c. kalamu zimo sandukuni
    'the pencils are inside the box'

d. *kalamu zimu sandukuni

The Emphatic Copula: [[[[ndi]]][[PCL]]]]

The emphatic copula, ndi-, agrees with its subject. However, in this case, the SP is a suffixed o-form PCL.

(20) a. hicho ndicho kitabu nillichokitafuta
    'this is the very book that I looked for'

b. *hicho ndiki kitabu nillichokitafuta

c. dawa hii ndio nzuri sana
    'this medicine is indeed very good'

d. *dawa hii ndiinzuri sana.

-ingine- : [[[[X]][[PCL]]]]

The word -ingine- agrees in two places with the noun it modifies. It is translated as 'some NP of the same kind'. In (21c) its prefix is from the nominal concordial affixes. Its suffix, however, is always an /o/ final PCL.
(21) a. nione kitabu kinginecho
   'show me a book of the same sort'

   b. *nione kitabu kingineki

   c. nione nyumba nyinginezo
   'show me houses of the same sort'

   d. *nione nyumba nyinginezi

And from Ashton [1966],

(22) ah walimu wa Nairobi wa macho kwa jambo hili na jinginelo
    teachers of Nairobi have eyes for matter this and others of the
    same kind

    'ah, the teachers of Nairobi are awake as regards this matter and
    any other like it'

The General Relative: [[[[X]]][[PCL]]]

In the general relative construction, there is no overt tense marker, and such relatives are most commonly interpreted as habitual. The relative pronoun is suffixed directly onto the verb stem, and it is an o-form PCL.

(23) a. kazi i-tu-faa-yo
    work SP-us-suffice-REL
    'work which suits us'

    b. *kazi itufaa

    c. vitabu ni-vi-soma-vyo
    books SP-them-read-REL
    'books which I read'

    d. *vitabu nivisomavi

The -li- Relatives: [[[[X]]][[PCL]]]

The present tense copula for relatives is -li-, prefixed with the SP and suffixed with the relative pronoun. The relative pronoun is an o-form PCL.

(24) a. kitabukilicho kidogo
    'books which are small'
b. *kitabu kili kido
g
c. nyumba nilizo nazo
    houses which I am with-them
    'houses which I have'
d. *nyumba nilizi nazo

Actually the sentences in (24) are further examples of the general relative construction. In this case the verb stem is -li-. In (18) we saw that the verb 'to be' may have a locative complement and that an o-form PCL may be suffixed to the stem kuwa. Identical facts are obtained with the present relative copula -li-. In this case -li- will end with two o-form PCL's, the relative pronoun and the locative clitic.  

(25) a. unga u-li-o-ko sokoni
    flour SP-be-REL-LOC at the store
    'flour which is at the store'

b. *unga uliuku sokoni

c. nataka kujua mahali u-li-po-po
    I want to know the place SP-be-REL-LOC
    'I want to know (the place) where you are'

d. *nataka kujua mahali ulipapa

We may compare the sentence in (25a) with that in (24c). In the latter sentence, the second o-form PCL occurs because the object of na has been relativized. Na always occurs with a clitic or with a lexical NP. In (25a)
the locative clitic is optional, just as they are in non-relatives, when a lexical NP follows the verbal unit.

To summarize, we have seen that PCL initial constituents are /0/-less, whereas in word final position an /0/ is epenthesized. Whether or not the system of rules in (4) and (5) apply will depend upon the position of the PCL and the height of the adjacent vowel, if there is one.

3. The Traditional Account

The formal similarity between /0/-form PCL's and their /0/-less counterparts has not escaped traditional grammarians. Yet they generally assume that /0/-form PCL's are semantically complex units in which the meaning associated with /0/ augments the meaning of the /0/-less PCL's. Loogman [1965:105] uses the term "kihušiano" and Ashton [1966] uses "O of Reference" to label the PCL+O union.

(26) "The term 'kihušiano', recently introduced, refers to an element that introduces a reference to another element of the sentence. The Swahili grammar of E.O. Ashton rightly puts all the weight on the special vowel which is used for that purpose and calls it the 'O of reference'.' [Loogman 1965]

Most traditionalists share Loogman's characterization of the semantic parameter introduced by /0/. Haddon's [1955:9] is a succinct and fair summary of the position taken in every printed discussion of these forms I have seen

(27) "Referential Partical: This formative uses the O of Reference completed with a pronominal concord to construct a particle, usually a suffix, which refers to something already mentioned or is understood." [italics,C.B-K.]

Essentially, (26) and (27) reduce to this: /0/-final PCL's are distinguished from /0/-less PCL's on the basis of semantic complexity. The former are composed of two morphemes while the latter are simple morphemes. According to (27), a PCL like yo in (2g) has all of the semantic features of its counterpart ya. However, yo has an additional feature, [+Already Mentioned], (hereafter, [AM]), a feature introduced by /0/ and unique to yo and all other /0/-final PCL's.
3.1. A syntactic consequence. Unfortunately, (27) does not accurately describe the simplest Swahili data, for a strict interpretation of Loogman's statement leads us to expect o-final PCL's as SP's. In Swahili, the subject NP normally precedes the verbal unit, which hosts the agreeing SP.

(28) a. klsu ki-ta-faa 'the knife will do'
   knife SP-TSN-suffice
   *kisu chotafaa

   b. visu vi-ta-faa 'the knives will do'
   knifes SP-TNS-suffice
   *visu vyotafaa

   c. mti u-ta-faa 'the tree will do'
   tree SP-TNS-suffice
   *mti otafaa

   d. miti i-ta-faa 'the trees will do'
   trees SP-TNS-suffice
   *miti yotafaa

Even though the subject NP is positionally already mentioned, the SP's in (28) are o-less PCL's. And this should not be the case if [AM] adequately differentiated the two sets of PCL's.

3.2. A semantic consequence. It is not impossible to imagine what it means for a PCL to refer to something already mentioned or understood. But what is difficult to imagine is what it means for a PCL not to refer to something already mentioned. If [AM] has any descriptive content at all, we would expect that PCL's which lack the feature to be non-referential or to refer to something not already mentioned or understood. But o-less PCL's refer just as o-form PCL's do. Out of context the referent in (29) is almost as unclear in Swahili as it is in the English gloss.

(29) klianguka⁵ 'it fell'

---

⁵The Swahili speaker is, however, a little more certain about the kind of referent ki might have, because ki contains more information than the English indefinite pronoun. The Swahili speaker would be safe in assuming
To be sure, the SP ki agrees with some absent NP. But more crucially, given an array of NP's earlier on in the spoken discourse (or even gestured at) only one of which is a KI class noun, ki will refer to that NP. In this sense, o-less PCL's like the SP in (29) refer to things that are already mentioned or understood in discourse. Since statements like (29) are perfectly well formed in discourse given the conditions mentioned above, the o-less SP's are referential in exactly the same way as o-form PCL's.

A point that should be stressed is that often the distribution of pronouns, or, as we have here, PCL's, may not be statable in sentence grammar or even in discourse grammar. But the distribution of o-form PCL's is limited to PCL final words, a generalization easily captured in the sentence grammar by a phonological rule.

3.3. The positional account. Traditionally the morpheme has been described as an arbitrary union of sound and meaning in the sense that its meaning cannot usually be predicted from its sound and vice versa. Such a description allots to meaning an essential role in assigning morphemic status to some phonetic string. However, it is commonly known that this definition excludes strings without the requisite constant meaning but which nevertheless regularly enter into word formation processes. Aronoff, for example, notes that words can be constructed from forms with underspecified meanings, like the latinate *mit* when combined with a set of latinate prefixes, e.g. *remit*, *commit*, *permit*, and the like. Yet, Aronoff [1976] isolates *mit* as a morpheme in its own right because it is linked to a phonological operation which produces the allomorph *mis* in the immediate environment of specific suffixes, *+ion*, *+ive*, *+ory*, and *+or*. While some morphemes may have a constant meaning, Aronoff concludes, those phonetic strings which do not show a specific meaning may nonetheless be isolated as morphemes because they are linked to a phonological operation before a set of designated morphemes. In such cases, the role of meaning must be "moved up", so to speak, to the word that the ki does not refer to something outside of the inanimate KI class, like an egg.
level. Aronoff [1976] goes on to broaden the definition of the morpheme to include not only an arbitrary union of sound and meaning as before, but also, where the meaning is underspecified as with mit, the linkage of the morpheme to a phonological operation.

The lexical phonology framework straightforwardly accommodates these conclusions. Simply stated, the /t/ → /s/ rule applies to the constant phonetic string /mit/ at the level where +ion, +ive, +ory, and +or are attached (presumably all are on the same stratum). In fact, adopting the lexical phonology framework subordinates questions about the meaning of a phonetic string to theoretical considerations of the organization of the lexicon itself where derivational and inflectional processes occur in a series of levels each associated with a set of phonological rules for which the level defines the domain of application. Within this framework, questions about the morphemic status of forms like mit demur to the kind of inquiry that lays the crucial theoretical and empirical foundation for establishing the strata in the lexicon of a particular language. Aronoff's constant input form, with or without a constant meaning, and a phonological operation adjust quite naturally within such a framework.

These considerations can shed some light on the status of /o/. I have attempted to show in the previous sections that the traditional meaning [+AM] is clearly inadequate. Moreover, it is unlikely that a uniform meaning can be established for the segment. However, if we adopt the lexical phonology framework, a slightly different question arises: is /o/ introduced phonologically or via morphological affixation? Having assumed earlier that the affixations and the phonological operations affecting PCL's all occur at the same level, suppose, in addition, that /o/ is suffixed by affixation rather than phonologically as proposed here. If so, then the operation deriving o-form PCL's would be comparable to the English rule which attaches the affixes mentioned above onto mit. According to Aronoff such outputs would be assigned some meaning after the affixation since mit has no inherent meaning. However, the Swahili case differs from the English case not only because the PCL's, the input, have unimpeachable morphemic status but also be-
cause the output is semantically identical to the input. In other words, whatever inherent meaning each PCL may have remains unaltered once /o/ is attached. Thus, although /o/ and mit may be similarly underdetermined semantically, the latter receives a specific meaning once affixation applies while the Swahili /o/ remains underdetermined.

There is another consideration which reveals a further dissimilarity between the two forms. In the English case an arbitrary set of affixes combines with mit to derive the outputs, but we cannot predict which morphemes can undergo affixation, e.g. we get permit but not *premit, admit but not *inmit, and so forth. However, in the Swahili case the affixation rule suffixes only one form onto PCL's. While nothing much can be made of this fact by itself, when it is taken in conjunction with the fact that the two PCL forms are in complementary distribution, a rule of /o/ affixation would reveal the crime without unmasking the culprit. Indeed, the data from section 2 leads unavoidably to the conclusion that a strong generalization about the distribution of PCL's stands to be missed if /o/ is simply suffixed by a rule of morphological affixation which ignores the phonological position of the PCL, for what is crucial here is more than simply the fact that /o/ is a PCL suffix. It is presence of o-form PCL's in constituent final position, a purely phonological environment. Clearly, a phonological rule should incorporate this critical phonological information, as this analysis has done.

This conclusion immediately raises an important question. Why is it an /o/ that is introduced? Of course, this question raises broad issues spanning more topics than those involving just Swahili PCL's, and any attempt to address the question will require extensive investigation into the phonology of the language. But one interesting observation about the segmental composition of Swahili clitics touches this question. Swahili clitics provide at least superficial support for the phonological analysis advanced here because the nuclei of almost all constituent non-final affixes, not just the PCL's, are typically not the mid vowels /o/ and /e/. The overwhelming majority of Swahili non-final affixes exclude /e/ and /o/ from their nuclei. On the other hand, constituent final clitics display high, mid and
low vowels in their nuclei. However, if Tense has constituent status, as I will suggest in Section 4.3, then even the tense markers containing mid-vowel nuclei (\(-me\), \(-to\), \(-japo\), and \(-nge\)) may themselves be constituent final morphemes. As such, their nuclei pattern along with the other Swahili clitics.

While this proposal represents a significant advance in the analysis of Swahili pronominal clitics, it also suggests a rich program of research. Once /0/ is accepted as a phonologically introduced segment, further research can proceed onto the substantially deeper issues concerning the organization of the Swahili lexicon.

4. Counterexamples

If, as I conjecture, its phonological position conditions the form of the PCL, this proposal makes strong predictions about the phonetic shape of word final, initial, and medial PCL's. We have seen that 0 Epenthesis inserts /0/ when a PCL ends a constituent. Accordingly, there should be no word initial or medial o-form PCL's. Conversely, only o-form PCL's should surface in word final position. Unfortunately, there are perfectly acceptable forms corresponding to each case that this proposal predicts should be unacceptable. The legitimacy of such cases appear to subvert this proposal. We shall see that the positional account correctly predicts that the Swahili verbal unit is structured. Before that discussion, I will present what seem to be the two prima facie counterexamples which will succumb to the positional account once it is enhanced with some basic assumptions from autosegmental phonology. I turn now to those cases.

4.1. The Near Demonstratives: [[[[h]]][[PCL]]]]. No doubt the tenacious appeal of [+AM] derives from its handy description of the near demonstratives, two forms where /0/ final and o-less PCL's occur side-by-side, as it were. Both near demonstratives agree with the noun they modify, and both end with a PCL. The forms in (31a) are the near speaker demonstrative and those in (31b) are the near listener demonstratives (hereafter SD and LD).
(31) a. kitabu hiki 'this book (near me)'
    miti hil 'these trees (near me)'
    yai hili 'this egg (near me)'

b. kitabu hicho 'this book (near you)'
    miti hiyo 'these trees (near you)'
    yai hilo 'this egg (near you)'

As for [+AM], Loogman [1965:354-355] associates the LD with the feature showing the best near-minimal pair I have seen:

(32) "The combination of demonstratives with the o of reference always refers to a previously mentioned situation, person or thing. It is therefore not correctly used to refer to something that has yet to be introduced into the discussion.

alipokwisha kusema maneno hayo
when he had finished saying words these
(the words have already been mentioned)

alipokwisha akasema maneno haya
when he had finished he said words these
(words to be quoted)"

For the traditionalists, then, the case of the near demonstratives support [+AM] because both PCL's are word final, but only one is 0-final. The problem introduced by these forms for our analysis is clear: 0 Epenthesis is blocked in the SD but not in the LD.

Actually, we will want 0 Epenthesis to play no crucial role in the derivation of these demonstratives for a very good reason. Throughout this discussion, we have claimed that the /0/ introduced by 0 Epenthesis is integrated into the segmental composition of the PCL and carries no morphemic weight. Accordingly, our phonological rules account for the form of the PCL depending upon its phonological position and the height of the adjacent vowel, if there is one. However, if 0 Epenthesis, a purely phonological rule, were allowed to apply in derivation of the LD, the proposal would become internally inconsistent, for, as we have seen, there is a uniform meaning difference between the two near demonstratives. This meaning dissimilarity attests that the /0/ retained in the LD is a morpheme in the classic sense.
When it is concatenated with a PCL and the near demonstrative stem, a meaning emerges which is distinct from that produced with a plain PCL. Quite simply, the meaning of the near demonstratives depends crucially on whether or not the LD /o/, not the epenthetic /o/ in (4), is present.

The analysis for these forms requires some basic assumptions from the version of autosegmental phonology described in McCarthy [1981, 1982] and Marantz [1982]. The essential notion is that information about lexical forms may be laid out as multidimensional representations. Each dimension, or autosegmental tier, represents an extraction of some aspect of the lexical form. One such tier which I will adopt in the analysis of the demonstratives is the CV tier or, following McCarthy, the prosodic template. We may think of the prosodic template as the tier which outlines the canonical shape of, in this case, the near demonstratives. The essence of the outline are the C's and V's, anchors which will support or bear the feature composition of consonantal and vocalic segments from the phonemic tier, the segmental level which contains the detailed feature composition of the prosodic template. General principles will normally determine how the features from the phonemic tier are associated or linked to the prosodic template. Taken from Marantz [1982:446-447], the conditions listed in (33) will provide for analyses of two of the apparent counterexamples.

(33) **Condition A:** Unless overridden by a special proviso, feature complexes containing the feature [-syllabic] can be linked only to C slots in the skeleton, and feature complexes containing the feature [+syllabic] can be linked only to V slots in the skeleton.

**Condition B:** After as many phonemes as possible are linked to C-V slots one-to-one in accordance with other conditions and principles, extra phonemes and C-V slots are discarded. There is no multiple attachment of phonemes to C-V slots or of C-V slots to phonemes....

**Condition C:** The slots in a C-V skeleton may be preattached to distinctive features. These features take precedence over the features of any phonemes from a phonemic melody which may link to these slots.

**Condition D:** (i) Linking of the phonemic melody to the reduplicating skeleton either begins with the leftmost phoneme of the melody linking to the leftmost C-V slot in the skeleton eligible under Condition A and proceeds from left to right or begins with the rightmost phoneme of the melody linking to the rightmost C-V slot of the skeleton and
proceeds from right to left. In the unmarked case, reduplicating prefixes associate with their melodies from left to right, reduplicating suffixes from right to left.

To illustrate, consider the representation of the interrogative -pi with a PCL prefix.

(34) kipi 'which one'

\[
\begin{array}{c}
\mu & \mu \\
\text{morpheme} \\
k & i & p & l \\
\text{phonemic tier} \\
C & V & C & V \\
\text{prosodic template} \\
\sigma & \sigma \\
\text{syllabic tier}
\end{array}
\]

A representation like (34) expresses the fact that kipi is a bisyllabic form composed of two morphemes where \( \mu = \text{morpheme} \) and \( \sigma = \text{syllable} \).

Such mappings must conform to Universal Well-formedness Conditions which prohibit (1) many-to-one mappings and (2) the crossing of association lines. Consider, then, the representation for nacho. After the application of the relevant phonological rules in (4) and (5) have applied to the string [[na][ki]], the string nacho may be mapped onto the prosodic template.

(35) nacho 'with it'

\[
\begin{array}{c}
\mu & \mu \\
\text{morpheme tier} \\
n & a & c & h & o \\
\text{phonemic tier} \\
C & V & C & V \\
\text{prosodic template} \\
\sigma & \sigma \\
\text{syllabic tier}
\end{array}
\]

Like kipi, nacho is a bisyllabic form consisting of two morphemes. However, the relevant Merging Rules apply triggered by the presence of the epenthetic /o/.

Like (34) and (35), both near demonstratives have identical prosodic templates, namely CVCV. However, for their analysis we must invoke Conditions C and D in (33). The former condition permits the speaker or listener morpheme, the final vocalic segment in the prosodic templates, to be preassoci-
ated. The word formation rule supplies the demonstrative morpheme $h$- and PCL.

(36) Near Listener Prosodic Template

\[
\begin{array}{c}
\mu \\
\text{listener morpheme} \\
o \\
h \\
v \\
k \\
C \\
v \\
vC \\
vC \\
vC \\
\end{array}
\]

(37) Near Speaker Prosodic Template

\[
\begin{array}{c}
\mu \\
\text{speaker morpheme} \\
v \\
h \\
v \\
v \\
k \\
v \\
vC \\
vC \\
vC \\
\end{array}
\]

(where $v$ = the nucleus of any PCL)

Along with $B$, Condition $D$ allows the entire phonemic melody of the PCL to be copied yielding the mappable representations shown below.

(38) a. near speaker

\[
\begin{array}{c}
h \\
v \\
nk \\
C \\
k \\
C \\
C \\
k \ \\
\end{array}
\]

b. near listener

\[
\begin{array}{c}
h \\
v \\
nk \\
C \\
k \\
C \\
C \\
ch \\
\end{array}
\]

In (38) the unassociated segment /$k$/ deletes by Condition $B$, leaving both forms with a word final CV, but only the near speaker demonstrative with a word final PCL. Importantly, the $O$ Epenthesis rule may not introduce its /$o$/ because the preassociated final V overrides it. In this way, $O$ Epenthesis plays no role in the derivation of the near demonstratives.\(^6\)

\(^6\)This solution to a difficult form may raise more problems than it
As for Loogman's sentence-pair in (32), an interpretation can be constructed which relies on the listener/speaker distinction. Consider the following: when an item, such as a book, is near the speaker, he has ready access to it—he may touch it, pick it up, even think about the object before he does anything with it. The demonstrative hiki reflects this sort of spatial relationship between the speaker and the object. Now, a sentence which is about to be uttered does not, of course, have the kind of spatial relationship to the speaker and listener that a book may have. However, in discourse, an unuttered sentence is nearer the speaker in exactly the same way. While he may not be able to touch it or pick it up, the speaker may certainly think about it, alter it, or even not say it. And when a speaker is going to say a sentence, he normally knows what he is going to say (or not say) far better than the listener does. In this sense, the sentence, like the book, is closer to the speaker than to the listener and hence would be appropriately modified by the near demonstrative. On the other hand, a sentence spoken by a speaker to an audience no longer belongs exclusively to the speaker. He may no longer alter it or not say it. It is the listener who now has control over that sentence in the sense that its interpretation may not entirely coincide with the speaker's intended interpretation. Considered in this manner, the uttered sentence is closer to the listener than to the speaker, and hence the near listener demonstrative is appropriately solved. For example, if the PCL's nucleus is preassociated onto the final vowel slot in the prosodic template and the PCL is copied, only the leftmost nucleus should be preassociated (i) not both nuclei (ii).

(i)  
(\[ h \ k \ i \ k \ i \]  
\[ C \ V \ C \ V \]  
(ii)  
(\[ h \ k \ i \ k \ i \]  
\[ C \ V \ C \ V \]  
Of course, the preassociation in (ii) will violate the universal condition on crossing association lines once the other segments are mapped. However, it is not clear that (i) can be achieved and (ii) avoided without an additional mechanism.
used. Thus, (32) does not present a problem. Both demonstratives reflect a spatial relationship whether they refer to physical or abstract entities.  

To summarize, the exceptionality of the near demonstratives lies in their partially preassociated prosodic templates. Everything else follows from universal principles and from the language particular rules proposed here. The near demonstratives are not counterexamples to our claim that the distribution of the o-form PCL's is phonologically determined because 0 Epenthesis plays no role in their derivation.

4.2. FCA Quantifier: [[[PCL]][[PCL]][[ote]]]]. The positional account predicts that all word initial PCL's will be o-less. However, the "free choice any" quantifier (hereafter, FCA) is such a case. It is composed of two o-form PCL's from the same noun class preceding the stem -ote. Since nothing may intervene between the two PCL's, I assume FCA's are one word units.

(39) a. nipe kitabu chochote  
SP-give book FCA  
'give me any book at all'  

b. sikuvuna tunda lolote  
SP-not-harvest fruit FCA  
'I did not harvest any fruit whatsoever'  

c. daktari yule ataponya magonjwa yoyote  
doctor that SP-TNS-cure disease FCA  
'that doctor will cure any disease whatsoever'  

What is peculiar about these forms is that 0 Epenthesis appears to have inserted /o/ onto the initial PCL, where it should not have. Strictly following our analysis, we would get forms which turn out to be unacceptable.  

7While agreeing that the demonstratives differ semantically, Wilt [1987] and Leonard [1985, 1987] present competing discourse conditions that determine the distribution of the SD and Far Demonstratives, seen in (9). For Leonard, the former includes the meaning High Concentration of Attention (COA) and the latter Low COA. On the other hand, Wilt proposes that an extended notion of proximity characterizes the demonstratives.
like *klchote. Fortunately, this data does not pose as serious a problem for our analysis of the PCL's as it might appear to at first glance once we recognize that the initial syllable is reduplicated. To see how FCA conforms to this analysis, let us briefly consider another quantifier, -ote, called here UQ. A PCL is prefixed onto the UQ stem.

(40) a. kiazī chote 'the whole potato'
b. viazī vyote 'all potatoes'
c. pori lote 'the whole bush'
d. miti yote 'all trees'

The prosodic template for UQ is CVCV. Drawing association lines for chote in (40a) poses no problem, since the Merging Rules will convert the PCL [ki] into /ch/ when it is adjacent to /o/.

(41) [[[[ki]]][[ote]]]]

ki ote → ch o t e
      |   |   |   |
      C V C V

It follows, then, that all PCL's will be o-final when prefixed onto UQ because the stem initial vowel is [-hi].

Turning now to the FCA, unfortunately several possibilities emerge for its analysis when the conditions in (33) are adopted. None of the various analyses will be examined in any detail here since FCA's status as a non-counterexample remains unaltered regardless of which analysis turns out to be the most pleasing. For now, let us assume FCA is formed by reduplicating the phonemic tier of the UQ prosodic template which is mapped onto CV prefix where the stem consonant is preassociated.

(42) FCA Prosodic Template

ch o t e   ch o t e
|   |   |   |
C V C V + C V C V

The left to right association principles maps /ch/ and /o/ onto the initial CV affix slots while /t/ and /e/ delete by principle. Importantly, the initial UQ segments are derived by the Merging Rules which, as we have
seen above, ignore the brackets separating a PCL from a stem initial vowel. The first V slot in the FCA is actually -ote's stem initial vowel, not the epenthetic /o/, which can play no role in the derivation of either UQ or FCA. That an /o/ surfaces in both forms is purely accidental. If the stem were, say, -ate, we would predict chate as a UQ and chachate as the corresponding FCA.

We conclude that FCA is a spurious counterexample since 0 Epenthesis does not apply, as it should not. FCA is simply a mapping of a reduplicated UQ template onto an initial CV affix. The relevant conditions in (33) take care of the rest.

4.3. The Relative and Object PCL's: Medial PCL's. Our analysis predicts that medial PCL's should be o-less since 0 Epenthesis applies to constituent final PCL's. However, it turns out that two PCL's may occur medially, the relative and the object clitic (hereafter OP). In the relatives below, both clitics are present.

(43) a. kitabu ni-li-cho-ki-andika
    book SP-TNS-REL-OP-write
    'the book which I wrote'

    b. watu wa-li-o-li-lima shamba hili
    people SP-TNS-REL-OP-cultivate farm this
    'people who cultivated this farm'

    c. ndizi ni-li-zo-zi-nunua
    bananas SP-TNS-REL-OP-buy
    'bananas which I bought'

The examples above are from the tensed relative construction where the relative pronoun may be cliticized onto one of four tense affixes: -li- past; -taka- future; -na- present; or -si- past, present, or future negative. Since the OP is not word final, it is o-less as predicted. Of course, the OP occurs in non-relatives as well, and in those sentences it remains o-less. But it is the form of the relative clitic that superficially damages this proposal because it surfaces as a medial o-form PCL.
Actually, our proposal makes a strong prediction about the structure of
the Swahili verb. If 0 Epenthesis applies to the relative PCL, as it has in
the amba and general relative constructions, then that clitic is constitu­
tent final in the tensed relative construction as well. On the other hand,
the o-less OP is constituent initial. At the word level, then, the Swahili
verb is analyzed as two constituents, as shown in the diagram below:

\[
(44) V \rightarrow INFL \rightarrow \begin{array}{c}
\text{c11} \\
\text{c12} \\
\text{c13} \\
\text{c14} \\
\text{verb}
\end{array}
\]

C11 is the subject affix, c12 the tense morpheme, c13 the relative PCL.
These clitics are dominated by INFL. However, the OP, c14, is dominated by
another word level constituent, called here Verb Stem. Below, I will present
the argument that validates the OP's position as a Verb Stem dependent. For
now, assuming such an analysis allows 0 Epenthesis to apply to c13 producing
the relative clitic. The object clitic, c14, will not undergo the rule since
it is constituent initial.

Contrast this analysis with a flat structure, one where the relative and
object PCL's are indeed "infixed".

\[
(45) V \rightarrow \begin{array}{c}
\text{c11} \\
\text{c12} \\
\text{c13} \\
\text{c14} \\
\text{verb stem}
\end{array}
\]

Under such an analysis, the relative clitic would not be subject to 0 Epen­
thesis and unacceptable surface representations like *nilikikisoma would
result. The rest of this subsection presents the evidence that supports the
structured analysis in (44).

The first supporting evidence comes from stress. Primary word stress in
Swahili is penultimate. For example, a question using the word translated
as 'how' is asked in two ways. Either namna gani occurs at the end of the
question, or je is suffixed onto the verb.

(46) a. alikwenda namna gani?
    he left how
    'how did he leave?'
In (46) primary stress falls on the penultimate syllable of the verb stem. However, in (47) primary stress falls on the syllable preceding je. So much for primary stress.

While traditional grammarians widely report secondary stress on some tense morphemes, as in (48d), my informants readily accept secondary stress on the syllable preceding the tense morpheme, as indicated below.

How are these facts to be accounted for in each analysis? In the structured analysis in (44), the primary stress rule applies to two constituents, Verb Stem and the material dominated by INFL. Thus the verb in (46a) would be analyzed as follows:
The primary stress rule applies to both portions of the verb. In order to account for the fact that INFL surfaces with secondary, not primary, stress, there is a rule which cliticizes INFL onto the verb, and a stress reduction process follows.

Somewhat different would be the analysis of secondary stress if the verb had the flat structure in (45). Secondary stress might be assigned by syllable counting from right to left. However, there is no uniform number of syllables to count. In (48a) through (48c), the fourth syllable receives the secondary stress. But it falls on the fifth syllable in (48d), as it does in (50a) and (50b), on the sixth in (50c) and the seventh in (50d).

(50) a. wa-ll-po-simáma
   SP-TNS-REL-stand
   'where they stood'

b. kitabu a-takà-sho-ki-sóma
   book SP-TNS-REL-OP-read
   'the book which he will read'

c. kitabu a-l]-cho-ki-andíka
   book SP-TNS-REL-OP-write
   'the book which he wrote'

d. watu wa-takà-o-ni-andíka barua
   people SP-TNS-REL-OP-write to/for letter
   'people who will write a letter to/for me'

A superficially plausible procedure for assigning secondary stress, syllable counting clearly doesn't account for the facts in any insightful way. On the other hand, with a dual constituent analysis, the primary stress rule will uniformly assign stress to the appropriate syllables.

The second piece of evidence favoring a structured analysis of the verbal unit comes from monosyllabic verbs. When monosyllabic verbs occur with some tense morphemes, like the ones we have seen in this paper, the infinitive marker ku is retained as a stress prop.

(51) a. ni-ll-kú-la
   SP-TNS-INF-eat
   'I ate'
b. a-me-kú-fa 'he has died'
   SP-TNS-INF-die
c. a-ta-kú-ja 'he will come'
   SP-TNS-INF-come

However, when an object clitic occurs, that clitic replaces ku.

(52) a. a-ll-kí-la 'he ate it'
   SP-TNS-OP-eat
b. *alikukila
   *alikikula

I will state the facts in (51) and (52) as a constraint.

(53) Monosyllabic Verb Constraint: A monosyllabic verb retains ku unless it is preceded by a sister-PCL when V contains T (where T is a partial list of the relevant tense affixes).

The constraint includes the sister-PCL proviso so as to be compatible with either a flat or structured verbal analysis. If the verb is unstructured, presumably all morphemes will be sisters. Essentially the constraint requires a PCL to intervene between the monosyllabic verb stem and the relevant set of tenses. The OP meets this requirement.

A plausible replacement for the constraint might be that Swahili verb stems must be at least bisyllabic. While this version of the constraint is compatible with the structured analysis in (44), the flat structure in (45) is already polysyllabic. Moreover, a constraint on the number of syllables doesn't explain why the OP counts as a syllable extender but the relative PCL doesn't.

(54) a. watu wa-ll-o-kú-la chakula
   people SP-TNS-REL-INF-eat food
   'people who ate food'
b. watu wa-ll-o-kí-la chakula
   people SP-TNS-REL-OP-eat food
   'people who ate the food'
c. *watu waliola chakula
d. watu wa-li-o-soma vitabu
   people SP-TNS-REL-read books
   'people who read books'

Example (54d) is included here to show that a polysyllabic verb need not co-occur with an OP when the subject is relativized.

It might be suggested that (53) may be replaced by a more general constraint, namely that o-form PCL's may not be stressed. However, we have seen above that two o-form clitics may be suffixed onto the monosyllabic copula -li-. And as expected, stress will fall on the penultimate syllable containing an o-form PCL.

(55) a. unga u-li-6-ko sokoni
   flour SP-be-REL-LOC at the store
   'the flour which is at the store'

b. watu wa-li-6-mo nyumbani
   people SP-be-REL-LOC inside the house
   'people who are in the house'

So, o-form PCL's are stressable, and the OP is the only PCL which can replace ku.

While we might restate the constraint in this way, such a revision provides no insight into why it is the OP, not the relative, which can replace ku. However, if the verb has the structure in (44), a clear explanation emerges. Since stress is penultimate, monosyllabic verbs dominated by the word level constituent, Verb Stem, must have at least two syllables. Either ku or an OP extends those verbs allowing the stress rule to apply.

These arguments from stress and from monosyllabic verbs demonstrate that the verb has the structure in (44). 0 Epenthesis will apply to the rela-

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8In addition, the rule which cliticizes INFL onto the Verb Stem (or vice versa) and the Stress Reduction rule apply.

9Both Wald [1973, 1976] and Givón [1971a, 1971b] reach this conclusion. Givón surveys the evidence suggesting that verb-deriving suffixes have historically arisen from main verbs. Relevant to this section, he proposes that the relative tense markers derived originally from verbs to which the relative pronoun was suffixed. The evidence from 0 Epenthesis provides syn-
tive clitic, an INFL final PCL, but not to the OP, a Verb Stem initial PCL.

As promised, I can now show that the OP is a Verb Stem dependent. As we have argued above, the primary stress rule applying to the word level INFL accounts for the secondary stress on that constituent. If the OP were an INFL dependent, secondary stress would fall on the relative PCL when there is no OP.

(56) a. [wa-1l-o] [li-líma]  
   SP-TNS-REL OP-cultivate  
   'those who cultivated it'

b. [waliO] [líma]  
   'those who cultivated'

c. *[waliòli] [líma]

(57) a. [wa-takà-o] [zi-nunúa]  
   SP-TNS-REL OP buy  
   'those who will buy it'

b. [watákøo] [nunúa]  
   'those who will buy'

c. *[watakaøzi] [nunúa]

However, the presence or absence of an OP does not alter secondary stress. As a Verb Stem dependent, the OP will not displace stress onto the relative PCL as in (56c) and (57c).

This subsection has provided support for a prediction made by the phonological analysis of o-form PCL's, namely, that the Swahili verb contains two word level constituents. The arguments from stress and monosyllabic verbs provide strong support for a structured verb. We can see now that relative pronouns in all three relative constructions in Swahili are o-form PCL's because O Epenthesis has applied to these word final clitics triggering the Merging Rules.

chronic support for a two-word analysis of the verbal complex.
5. Conclusion

This lengthy discussion has been unswerving in its goal. I have proposed that the form of the inanimate inflectional clitic is positionally determined, modified by the purely phonological rules of O-Epenthesis and/or Merging. We have seen that a wide range of data succumbs to the treatment here and that the prima facie counterexamples provide further support for the analysis.

But some data doesn't submit as easily to this positional account. It is fitting to conclude by providing some perspective on what has been achieved here, what has not, and what issues this analysis raises. Before looking at the problematic data, a general assumption should be repeated here. Adopting the ordered strata of Lexical Phonology has permitted the account of the PCL allomorphic variation to be stated as purely phonological rules, unencumbered by + or # boundaries, or by diacritics. This simplicity, a welcome accomplishment, is due to the broad morphological assumption that PCL Attachment takes place on one level. However, a survey of all non-nominal PCL's reveal two cases which indicate that a one-level account of PCL Attachment doesn't easily complement the phonological analysis presented here.

First, we have proposed that the Merging Rules apply whether or not the adjacent [-hi] vowel is introduced by O Epenthesis or is word-stem initial. Yet, Merging never applies when a PCL like the OP precedes a [-hi] vowel initial verb stem, as in alikiona 'he saw it'. According to the standard explanation, a word boundary # surrounds the lexical category, verb stem, and effectively blocks the relevant phonological rules. But this sort of explanation is unavailable in Lexical Phonology.

Secondly, for the most part we have systematically excluded animate inflectional clitics from this analysis for a very good reason. While word initial animate PCL's like the subject prefix normally merge with an adjacent [-hi] vowel, O Epenthesis simply doesn't apply when an animate PCL occurs word finally. O Epenthesis is, thus, restricted to inanimate PCL's. These facts are summarized in the table opposite.
(58) NON-NOMINAL INFLECTIONAL PCL ATTACHMENT

<table>
<thead>
<tr>
<th>PCL + X</th>
<th>PCL # X</th>
<th>X + PCL</th>
<th>X # PCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>INANIMATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>example: chatosha</td>
<td>aliklona</td>
<td>nacho</td>
<td>akionacho</td>
</tr>
<tr>
<td>'it is enough'</td>
<td>'he saw it'</td>
<td>'with it'</td>
<td>'he who sees it'</td>
</tr>
<tr>
<td>P. Rules: Merging</td>
<td>No Rule</td>
<td>O Epenthesis</td>
<td>O Epenthesis</td>
</tr>
</tbody>
</table>

| ANIMATE | | | |
| example: nasoma | aliniona | nami | aonaye |
| 'I read' | 'he saw me' | 'with me' | 'he who sees' |
| P. Rules: Merging | No Rule | No Rule | No Rule |

That the phonological rules are blocked in the areas marked 'No Rule' constitutes a problem for the morphology, for it would seem that the morphology is the appropriate place to handle distinctions between animate and inanimate clitics and major lexical categories (like verb stem) and minor lexical categories (like Tense, FCA and the like). If so, then the burden of explanation for the inconsistencies in (58) falls naturally on the morphological companion to this phonological piece, for the table in (58) raises a fundamental question for Lexical Phonology: on what universal or parametric basis are the morphological strata established? The resolution of this question will settle both theoretical and Swahili specific issues such as whether PCL Attachment is achieved in ordered or simultaneous sub-levels divided on the basis of position or animacy or both, whether or not those sub-levels are blind to each other, whether or not the divisions are maintained in subsequent levels, and finally, what kind of morphological framework best complements these appealingly simple phonological operations. These puzzles form the basis of work in progress.


HYPOTHESE DU MORPHEME VERBAL DISCONTINU -\textit{id}-e

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Le morphème polyphonique -\textit{id}-e tel que reconstitué en proto-bantu comme marque verbale du passé de l'indicatif apparaît dans beaucoup de langues bantu actuelles sous une forme dont le comportement autorise la segmentation en deux éléments discontinus -\textit{id}-e. Le kizéela en fournit la meilleure vérification avec l'insertion de l'extension passive sans qu'il soit néanmoins possible d'attribuer une quelconque signification à chacun des éléments ainsi dégagés -\textit{id}- et -\textit{e} pris isolément.

1. Introduction

Parmi les morphèmes de conjugaison qui entrent dans la constitution d'une forme verbale, la finale -\textit{ile} semble être parmi ceux dont la distribution géographique est la mieux exploitée pour en justifier une reconstruction sous la forme -\textit{id}-e en proto-bantu [Guthrie 1970, Meeussen 1965].


Il est possible de rendre compte des différentes modifications formelles ci-dessus évoquées à l'aide des règles morphonologiques et de poser une finale polyphone -\textit{id}- [Bastin 1983] plutôt qu'un morphème discontinu ou encore une suite de deux morphèmes en l'occurrence -\textit{id}-e.
1.1. L'harmonie vocalique. Il s'agit d'une règle morphonologique dont l'application déborde le cas précis de la finale -ile. Cette règle touche les morphonèmes °i (et °u) apparaissant dans les extensions verbales et dans la finale -ile. D'une manière générale, le morphonème °i est représenté par le phonème /e/ après un radical comportant le morphonème °e ou °o. Il s'agit donc d'une règle d'assimilation progressive à distance ainsi qu'en témoignent les exemples suivants:

(1) kúlembá → baálembele < °ba-a-lemb-ile
 'écrire' 'ils avaient écrit'

kúsongá → náásongele < °ná-a-song-ile
 'épouser' 'j'avais épousé'

kúkendá → wákendele < °u-a-kend-ile
 'laver' 'il avait lavé'

kúkombá → twákombele < °tú-a-komb-ile
 'balayer' 'nous avons balayé'

Il va de soi que ce morphonème °i a une représentation directe lorsque la syllabe précédente comporte l'un des morphonèmes °a, °i ou °u :

(2) kúpitá → baápitile < °ba-a-pit-ile
 'passer' 'ils étaient passés'

kúsalá → náásadile < °ná-a-sad-ile
 'tatouer' 'j'avais tatoué'

kúsumá → wásumine < °u-a-sum-ile
 'mordre' 'il avait mordu'

kútuuká → twátuukile < °tú-a-tuuk-ile
 'descendre' 'nous étions descendus'

kúsoóká → wásóókele < °ú-a-sóok-ile
 'brûler' 'tu avais brûlé'

kúteelá → mwáteelele < °mu-a-teel-ile
 'citer' 'vous avez cité'
1.2. **L'harmonie nasale.** De la même manière que l'harmonie vocalique, l'harmonie nasale concerne le morphonème °l aussi bien de la finale -ile que de suffixes verbaux. Ce morphonème est représenté par le phonème /n/ lorsque la syllabe précédente comporte une nasale simple:

(3) kútomá → náátomene < °ná-á-tom-ile
   'boire' 'j'avais bu'

   kútámá → baatámine < °ba-á-tám-ile
   'grandir' 'ils avaient grandi'

   kúsómá → wássómen < °ú-á-sóm-ile
   'lire' 'tu avais lu'

   kútéémá → náátéémene < °ná-á-téém-ile
   'brûler' 'j'avais brûlé'

   kúsoná → baásonene < °ba-á-son-ile
   'coudre' 'ils avaient cousu'

   kúcfná → twácfnine < °tú-á-cfn-ile
   'écraser' 'nous avions écrasé'

Ici aussi, le morphonème °l de cette finale apparaît sous la forme directe /l/ lorsque la syllabe précédente ne comporte pas de nasale simple:

(4) kúpelá → mwápelele < °mu-á-pel-ile
   'refuser' 'vous avez refusé'

   kútéká → baátekélé < °ba-á-tek-ile
   'puiser (l'eau)' 'ils avaient puisé'

   kúlobá → wálobèle < °u-á-lob-ile
   'pêcher' 'il avait pêché'

   kúshítá → nááshitile < °ná-á-shit-ile
   'fermer' 'j'avais fermé'
1.3. La métatélescopage. La métatélescopage consiste en l'application simultanée de la métathèse et de l'imbrication sur certains types de bases verbales au contact avec la finale -ille. La métathèse d'une part, intervient entre la consonne finale de la base verbale et la consonne °l de la finale -ille ; l'imbrication d'autre part, consiste en la suppression du morphonème °l de la finale -ille, cette suppression s'accompagnant ainsi d'une contraction vocalique entre la voyelle du radical et la voyelle °i de la finale -ille. Il s'agit plus précisément des consonnes faisant partie des extensions du type -VC- ou des consonnes finales des radicaux de forme CaaC ou CSaC.

La séquence CaaC + ile = /CeeCe/ ; il faut noter la contraction vocalique régulière a + i = /ee/ :

(5) kúlaalá → nááleele < °ná-á-laal-ille
'dormir' 'j'avais dormi'
kúbáábá → baabebe < °ba-a-bááb-ille
'calomnier' 'ils avaient calomnié'
kúkááká → wáéeeke < °u-a-káák-ille
'filtrer' 'il avait filtré'
kúpaápá → náápeepe < °ná-á-pááp-ille
'porter sur le dos' 'j'avais porté sur le dos'

La règle ainsi posée ne s'applique pas lorsque la voyelle longue du radical est autre que /aa/ .

(6) kúpóópá → náápóópele < °ná-á-póóp-ille
'marteler' 'j'avais martelé'
kúplípá → twáplípíle < °tú-á-pílp-ille
'plier' 'nous avions plié'
kúsúúsá → mwásúúsíle < °mu-á-súús-ille
'filtrer' 'vous avez filtré'
La séquence CSaC + iele = CSeCe :¹

(7) kúkwatá → wákwele < ṿú-á-kwat-ile
'prendre' 'tu avais pris'
kúvwalá → náávwle < ṿná-á-vwal-ile
'se vêtir' 'je me suis vêtu'
kúpyaná → baâpyene < ṿba-á-pyan-ile
'hériter' 'ils avaient hérité'
kúbyalá → twâbyele < ṿtú-á-byal-ile
'se semer' 'nous avions semé'

Cette représentation spéciale n'a pas lieu lorsque la voyelle du radical est autre que a.

(8) kúfyona → nááfyonene < ṿná-á-fyon-ile
'érnuer' 'j'avais éternué'
kúbyólá → baâbyôlele < ṿba-á-byól-ile
'roter' 'ils avaient roté'
kúkwésá → wakwésele < ṿu-á-kwés-ile
'gratter' 'il avait gratté'

Extension -VC- + iele = V + i + Ce (avec possibilité de contraction entre V et i) :

(9) kúfukámá → nááfukeeme < ṿná-á-fuk-am-ile
's'agenouiller' 'je m'etais agenouillé'
kúlámátá → kyalámeete < ṿki-á-lám-at-ile
'se coller' 'il s'était collé' (cl.7)
kúpükíká → byapükikíke < ṿbl-á-pük-ik-ile
'brûler' 'ils étaient brûlés' (cl.8)

¹Dans ces formes, S représente la semi-voyelle /ʏ/ ou /w/ et C n'importe quelle consonne, tandis que V représente n'importe quelle voyelle.
kúbumbátá → byábumeete < °bl-a-bumb-at-iše
's'amasser' 'ils s'étaient amassés' (c1.8)
kúsangálá → náásangeele < °ná-a-sang-al-iše
'être content' 'j'étais content'
kúpomóká → kyápomweke < °ki-a-pom-uk-iše
's'écrouler' 'il s'était écroulé' (c1.7)

2. Hypothèse du Morphème Discontinu

Les morphèmes sont déterminés d'après leurs formes et leurs fonctions. Ils sont constitués d'un ou de plusieurs morphonèmes. La possibilité d'intercaler de nouvelles unités morphologiques entre deux morphonèmes appartenant à un même morphème est en principe exclue si bien que les morphèmes lexicaux ou grammaticaux sont généralement du type continu et non discontinu [Bastin 1983]. La discontinuité suppose, sur le plan théorique, la possibilité d'intercaler entre deux morphonèmes un segment morphologique quelconque.

L'examen des diverses manifestations de la finale -iše permet, au terme de l'acception du morphème discontinu, d'y voir une succession de deux segments en l'occurrence -íi- et -e. Cette hypothèse d'interprétation repose sur des faits suivants: (1) Parmi les suffixes dérivatifs, les plus productifs sont l'applicatif, le causatif, le réciproque et le passif. Ils sont soumis en principe aux mêmes contraintes syntagmatiques. Dans la composition d'une forme verbale par exemple, ils se placent après le radical, mais avant la finale. (2) Les suffixes dérivatifs sont associés au radical comme des morphèmes de formation, c'est-à-dire, portant le sens lexical du verbe. Il est établi que les suffixes suivent, sur le plan syntagmatique, le radical et précèdent la finale [Masa 1973].

Parmi les suffixes dérivatifs, le passif semble néanmoins avoir un comportement quelque peu particulier. En effet, contrairement aux autres suffixes qui se placent entre le radical et la finale, ce suffixe s'intercale dans le morphème -iše de la manière suivante: u+iše se manifeste comme une succession de -íi-+u-+e , c'est-à-dire /-ilwe/. Il y a donc un phénomène de métathèse lequel consiste en la permutation dans l'ordre de succession des morphonèmes.
Il convient de ne pas interpréter cette règle de métathèse en termes morphonologiques parce que en effet elle concerne le type précis de morphème, c'est-à-dire le passif -u- et la finale -ile. En conséquence, ce comportement offre un exemple d'infixation d'un segment morphologique autonome à l'intérieur d'un autre morphème précis. Ce qui implique le caractère discontinu de la finale -ile tel qu'en témoignent les exemples ci-dessous:

(10) kútumwá < °kú-tum-u-á → náátuminwé < °ná-á-tum-u-ilé
    'être envoyé' 'j'avais été envoyé'

kúkwatwá < °kú-kwat-u-á → báákvetwé < °ba-á-kwat-u-ilé
    'être pris' 'ils étaient pris'

kúdímwá < °kú-dím-u-á → bwadímínwé < °bu-á-dím-u-ilé
    'être cultivé' 'il(champ) était cultivé (cl.14)

kúbálwá < °kú-bál-u-á → twábándilwé < °tú-á-bál-u-ilé
    'être compté' 'nous étions comptés'

kúmonwá < °kú-mon-u-á → mwámnwenwé < °mu-á-mon-u-ilé
    'être vu' 'vous étiez vus'

kúsélwá < °kú-sél-u-á → náásélélwé < °ná-á-sél-u-ilé
    'être emporté' 'j'étais emporté'

kúsabwá < °kú-sab-u-á → dyásabiliwé < °di-á-sab-u-ilé
    'être crevée' 'il(l'oeil) était crevé' (cl.5)

kúlembwá < °kú-lemb-u-á → yálembelwé < °i-á-lemb-u-ilé
    'être écrit' 'elles(lettres) étaient écrites'

L'insertion du suffixe passif -u- à l'intérieur du morphème final -ile ou ses équivalents, a une distribution géographique étendue à plusieurs zones bantu. Les exemples qui suivent en donnent une illustration dans les langues lúba Shaba (zone L), bembá, taabwa (zone M) et bwisha (zone J).
(11) a. lūba Shaba (L33)
kúsongwá < °kú-song-u-á → wásongelwé < °u-á-song-u-ílé
'b'être épousé' 'elle était épousée'
kútomwá < °kú-tom-u-á → aátomenwé < °a-á-tom-u-ílé
'b'être bu' 'elle (boisson) était bué' (cl.6)
kútongwá < °kú-tong-u-á → wátongelwé < °u-á-tong-u-ílé
'b'être choisi' 'il était choisi'
b. bemba (M42)
úkupumwá < °ú-ku-púm-u-a → nali-púminwé < °na-li-púm-u-ílé
'b'être battu' 'j'étais battu'
ukuséndwá < °u-ku-sénd-u-á → baaliseñdélwé < °ba-ali-sénd-u-ílé
'b'être emporté' 'ils étaient emportés'
c. taabwa (M41)
kuumwa < °ku-um-u-a → wauminwe < °u-a-um-u-íle
'b'être battu' 'tu étais battu'
kulombwa < °ku-lomb-u-a → walombelwe < °u-a-lomb-u-íle
'b'être demandé' 'il avait été demandé'
kusaakwa < °ku-saak-u-a → wasaakilwe < °u-a-saak-u-íle
'b'être tamponné' 'il avait été tamponné'

En bwisha, parler qui se rattache à ce qui est communément connu sous
l'appellation rwanda ou kinyarwanda (appellation impropre selon nous), la fi­
nale -ide se reflète sous la forme -ye présentant le même caractère dis­
continu que dans les exemples ci-dessus. La présence du suffixe passif per­
met en effet de voir en ce morphème final une succession de °y et °e .

Cette finale est attestée sous la forme directe -ye entre autres dans
les exemples suivants:

(12) bwisha (J61)
guha → twahaaye < °tu-a-haa-ye
'donner' 'nous avons donné'
Dans beaucoup de cas, il y a une contraction spéciale entre la consonne finale de la base verbale et le morphonème °y de la finale -ye.

(13) a. °t + y + s
   gukubita → twakubise < °tu-a-kubit-ye
   'frapper' 'nous avons frappé'

b. °h + y + sh
   guhaaha → twahaashe < °tu-a-haah-ye
   'faire des achats' 'nous avons fait des achats'

c. °g + y + z
   guhaaga → twahaaze < °tu-a-haag-ye
   'se rassasier' 'nous nous sommes rassassés'

d. °k + y + ts
   kubilika → twabiltse < °tu-a-biik-ye
   'conserver' 'nous avons conservé'

Compte tenu d'une part de la contraction spéciale telle qu'on peut l'observer dans les exemples ci-dessus (13), et d'autre part de la succession possible entre le suffixe et la finale -ye, les formes ci-dessous montrent que la séquence consonne finale C de la base verbale + suffixe passif -u- + finale -ye est représentée de la manière suivante: C - Y - u - e, par exemple

(14) a. °t-u-ye → swe
   gukubita → gukubitwa → twakubitswe < °tu-a-kubit-u-ye
   'frapper' 'être frappé' 'nous avons été frappés'
b. °h-u-ye → shwe
   kuriha → kurihwa → twarishwe < °tu-a-rih-u-ye
   'rembourser' 'être remboursé'
   'nous avons été remboursés'

c. °k-u-ye → tswe
   gutuka → gutukwa → twatutswe < °tu-a-tuk-u-ye
   'injurier' 'être injuré'
   'nous avons été blessés'

d. °g-u-ye → zwe
   gusanga → gusangwa → twasanzwe < °tu-a-sang-u-ye
   'ronconter' 'être roncontré'
   'nous avons été roncontrés'

3. Conclusion
   A la lumière des exemples qui viennent d’être évoqués, le caractère dis-continu de la finale -i l'e paraît établi. Il est aussi établi que cette fi-nale dérive de la forme -*ld-e reconstituée pour le proto-bantu. Si le car-actère discontinu de cette finale ne remonte peut-être pas au proto-système reconstitué, il serait intéressant d'en examiner le comportement formel lors-qu'elle se trouve en contact avec certains suffixes précis dont le suffixe passif.

REFERENCES


INDIRECT OBJECTS IN SISWATI*

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Contrary to the view that in Bantu languages the two unmarked nominals following the verb in ditransitive constructions need not be distinguished because both possess the same object properties, this paper shows the necessity of making a distinction between the direct object and the indirect object relations. Evidence comes from SiSwati, the language of Swaziland, and the analysis of the data is cast in the Relational Grammar framework. The arguments presented refer to word order, object concord (or pronominal copy) and the interaction between object concord and some syntactic phenomena such as passivization, topicalization, relativization, and clefting. By distinguishing the direct object from the indirect object in Siswati, the grammar is able to provide a more natural account for a number of related double object constructions.

0. Introduction

One problem that remains unresolved in accounting for the grammatical relations in Bantu languages is determining the status of the two unmarked nominals, i.e. occurring without a marker, following the verb in ditransitive constructions. Two proposals are in competition. On the one hand, Gary and Keenan's [1977] "Two Objects Analysis" (TOA) for Kinyarwanda claims

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1I would like to express much appreciation to Joyce Sukumane, an MA graduate from our Department, for providing the language data for analysis and for passing grammaticality judgments on other sentences in this paper. Also, I thank William O'Grady for his helpful questions and comments. For any errors in data and analysis, I remain responsible. In examples, ' represents High tone, ' Low tone, ' Lowered High tone, and ^ Rising-falling tone.
that the grammatical relations direct object (DO) and indirect object (IO) are collapsed into the single grammatical relation DO and that more than one NP in a clause can bear the DO relation to the verb. Since these two NP's both possess DO properties, they need not be distinguished. (See also Hodges [1977], Kisseberth and Abasheikh [1977], Kimenyi [1980], Hyman and Duranti [1982].) On the other hand, it has been suggested and argued that the DO is distinct from the IO in these languages, although quite similar in their syntactic properties. (Dryer [1983], Perlmutter and Postal [1983], Frantz [1984].)

This paper, cast in Relational Grammar (RG), presents some arguments to support what Dryer calls the "Indirect Object Analysis" (IOA) which follows the suggestion made by Peter Cole. Evidence comes from Siswati, a Bantu language spoken in Swaziland. It will be shown that a distinction between DO and IO needs to be maintained in order to make certain predictions of grammaticality. In so doing, the validity of the Stratal Uniqueness Law is upheld. The constructions involving two unmarked nominals that are considered here are: (a) active verbal ditransitive sentences; (b) morphological causative sentences with a transitive complement clause; and (c) sentences with a benefactive, a locative or goal, or an instrumental nominal as one of the unmarked nominals. The last set of sentences are included because these oblique nominals manifest either an IO or a DO function when occurring as an unmarked nominal.

The object properties discussed by Hyman and Duranti [1982:220-221], which according to them are assumed by Bantuists, are as follows: (a) access to the position immediately following the verb; (b) capability of assuming the subject role through passivization; and (c) its expression as a clitic object marker within the verbal complex. The onus on the IOA position is to distinguish the two grammatical terms on the basis of these properties. Following the advancement rules and causative clause union rules that RG uses to explain revaluations of grammatical relations, we will point out some significant behaviour of the two terms in question.
1. Arguments for the Existence of IO in SiSwati

Three syntactic arguments to support the distinction between IO's and DO's are shown in (a) word order, (b) object concord (OC) and passivization, and (c) OC and topicalization, relativization, and clefting.

1.1. Word order. A common observation in Bantu languages is that when a verb allows two unmarked nominals to cooccur with it, the NP corresponding to the recipient, traditionally labelled IO, comes before the NP that indicates the patient, which is associated with the DO. SiSwati is an SVO type of language and the order IO before DO is observed to an inviolable degree. For example:

(1) Jōhn ú-ník-è sínínì bānānà
    SC-give-tns friend
    'John gave a/the friend a banana'

If the order IO followed by DO is reversed, the interpretation continues to be that of the sequence recipient followed by patient, resulting in pragmatically unacceptable sentences. This linear precedence holds for causative constructions as well.

(2) mákè ú-gèz-ls-è Tōzī lībhōdō
    mother SC-wash-caus-tns pot
    'mother made Tozi wash the pot'

Following the clause union analysis of causative constructions where the subject of the transitive complement clause, Tōzī in this case, becomes the IO in the upstairs clause, and the downstairs DO, lībhōdō 'pot', is upstairs DO, we find the same order of IO followed by DO applying in this type of causative construction. If we were to change lībhōdō with an animate noun, say, īnjā 'dog', and reverse the position of the two animate nouns, the only interpretation that can be associated with the sequence is 'mother made the dog wash Tozi' which once more is pragmatically odd. This implies that the two unmarked NPs are distinguished positionally. The IO has a fixed position as far as its cooccurrence with the DO and the unmarked verb (for OC).
is concerned.² The DO may register a corresponding OC marker or clitic in the verb, and when it does, the word order changes.

1.2. OC marking and passivization. In the literature cited, it has been observed that both unmarked NPs following the verb are capable of being expressed as a pronominal clitic or OC in the verb. While it is true that in Kinyarwanda both unmarked NPs may be indicated simultaneously in the verb, and thus show a strict clitic ordering of DO followed by IO, this situation does not obtain in SiSwati. Unfortunately, the fact that only one OC marker at a time can be registered does not strengthen the argument for making a distinction between IO and DO. Moreover, the ability of either NP to be expressed as a pronominal clitic seems to confirm the proposal that both nominals exhibit this particular property of true objects. For example:

(1) a. J̄ohn ú-wù-nk-è sînínl (bànnànà) SC-OC-give-tns friend
     'John gave-it (banana) to a friend'

   b. J̄ohn ú-síf-nk-è bànánà (sînínl) SC-OC-give-tns friend
     'John gave-him (friend) a banana'

Similar to the observation in Kimeru [Hodges 1977:115], it will be noted that when an OC is registered in the verb, the referent NP object gets shunted to the end of the predicate or is deleted. Despite the fact that the TOA may be said to account for the structure in (1a) and (1b), there is no compelling reason to reject the RG account for (1b) as an instance of an initial IO or term 3 having advanced to DO or term 2 in final stratum, especially when it has relevant syntactic consequences which will become apparent subsequently. A general constraint proposed here states that only final 2 may optionally trigger an OC. Following this constraint, sînínl 'friend' in (1a) is initial and final 3 and bànánà is initial and final 2. In (1b), however, sînínl is final 2 via 3 to 2 advancement. Thus, it is allowed to be marked

²It is significant to note that the putative IO function is not only aligned with "recipients" but also with "causees".
with its appropriate OC clitic -s- and bánánà is final 2-chômeur. The same constraint may be seen as applying to the causative construction given in (2). Without any advancement rule applying, (2) may alternatively be rendered as follows when final 2 registers an OC:

(2) a. mákè ú-í-gèz-ís-è Tòžì (líbhòdò)
mother SC-OC-wash-caus-tns pot
'mother made Tozi wash it (pot)'

With a 3 to 2 advancement, the initial IO, Tòžì, now takes OC and is shunted or deleted as follows:

(2) b. mákè ú-m-gèz-ís-è líbhòdò (Tòžì)
mother SC-OC-wash-caus-tns pot
'mother made her (Tozi) wash the pot'

One other piece of evidence used to support the TOA is the capability of either the DO or the IO to assume the subject relation through passivization. The following passive sentences, indicated by the affix -w- in the verb, show each unmarked NP in question (1) and (2) in the subject position:

(1) c. bánánà ú-ník-w-è sínínì ngu Jòhn
    SC-give-pass-tns friend by
    'the banana was given to a friend by John'

d. sínínì sí-ník-w-è bánánà ngu Jòhn
    friend SC-give-pass-tns by
    'the friend was given a banana by John'

(2) c. líbhòdò lí-gèz-ís-w-è Tòžì ngu mákè
    pot SC-wash-caus-pass-tns by mother
    (lit.) 'the pot was made to be washed by Tozi by mother'

d. Tòžì ú-gèz-ís-w-è líbhòdò ngu mákè
    SC-wash-caus-pass-tns pot by mother
    'Tozi was made to wash the pot by mother'

Much like the observation on OC, it may be said that the (c) and (d) sentences above make no distinction between a DO and an IO in their ability to passivize. However, within the RG framework, passivization may be accounted
for via a 2 to 1 advancement, for (1c) and (2c), or via a 3 to 1 advancement, for (1d) and (2d). The significant distinction between the IO and the DO can now be shown in the corresponding OC-marked passive sentences:

(1) e. *bànánà ú-sí-ník-wè ngu Jòhn (sìnínì)
   SC-OC-give-pass-tns by friend
   'the banana was given him (friend) by John'

f. sìnínì sì-wù-ník-wè ngu Jòhn (bànánà)
   friend SC-OC-give-pass-tns by
   'the friend was given it (banana) by John'

(2) e. *lìbhòdò lì-m-gèz-fs-wè ngu màkè (Tòzì)
   pot SC-OC-wash-caus-pass-tns by mother
   'the pot was caused to be washed by her (Tozi) by mother'

f. Tòzì ú-lì-gèz-fs-wè ngu màkè (lìbhòdò)
   SC-OC-wash-caus-pass-tns by mother pot
   'Tozi was made to wash it (pot) by mother'

In (1e) and (2e), we have the typical case of 2 to 1 passivization, but with the additional OC marking corresponding to the other unmarked NP, our putative IO. Unlike (1c) and (2c) with the same type of passivization, (1e) and (2e) are ungrammatical. This is evidence to show that with a 2 to 1 advancement, the nominals sìnínì and Tòzì are not legitimate 2's or DO's, at this level, thus, they cannot take OC. It is reasonable to claim that these nominals are final 3's or IO's. In (1f) and (2f), the type of passivization exhibited here is identical to (1d) and (2d), where the supposed initial IO or 3 advances to 1. The striking difference is that the cooccurring initial 2, after 3 advances to 1, remains to be a 2, as evidenced by its ability to register an associated OC. 3 Thus, it is not enough to show that either un-

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3It may also be argued that the (d) and (f) sentences manifest 3 to 2 advancement and then 2 to 1 passive, resulting in a cooccurring 2-chômeur. Concomitantly, OC is taken by acting 2's, i.e. final 2 or final 2-chômeur, instead of just final 2's. This line of argument, however, is withheld until further investigation. For now, this is seen as serving only the rule for OC, whereas limiting OC to final 2 generalizes to other syntactic phenomena.
marked nominal is capable of being expressed as the subject of the sentence to justify positing the same grammatical relation for both NP's. The more important and relevant structure is the contrast between a final 2 and a final 3 in terms of their ability to take optional OC in both types of passive constructions.

1.3. OC and topicalization, relativization, and clefting. Three other syntactic phenomena which attest to the same type of distinction between the two unmarked NP's are topicalization, relativization, and clefting. Each process will be illustrated as it interacts with OC. Let us begin with topicalization. Given sentence (1), final 2 may be topicalized rendering:

(1) g. bànanà Jõhn û-(wù)-ník-è sínínì
SC-(OC)-give-tns friend
'the banana, John gave to a friend'

Compared with (1b) where we claim that initial 3 advanced to 2, as evidenced by its ability to take OC, we cannot topicalize on bànanà because it has become a final2-chômeur. Thus,

(1) h. *bànanà Jõhn û-sí-ník-è (sínínì)
'the banana, John gave him (friend)'

On the other hand, topicalizing on sínínì in (1b) results in a grammatical sentence. If indeed the recipient nominal, sínínì in (1), were also a DO just like the patient nominal bànanà, then topicalizing it without its corresponding OC should not render an ungrammatical form, yet it does. Furthermore, if these two nomina1s were actually identical in grammatical function, the following construction, where the patient is marked with OC and the recipient is topicalized, should not be blocked:

(1) i. *sínínì Jõhn û-wù-ník-è (bànanà)
'the friend, John gave it (banana) to'

Evidently, the TOA will need some constraints to prevent these ungrammatical sentences from being generated. The IOA, on the contrary, can account for them quite naturally by saying that the verb unmarked for OC cooccurs with
the initial DO as final 2 and the initial IO as final 3. As a final 3, the IO does not topicalize. Similarly, in (li), bânànà marked with a corresponding OC is final 2, and sînînî is not final 2, but final 3, hence, it cannot be topicalized. Having shown this difference in behaviour between the two nominals, we can claim that they start with different functions, one being a DO and the other an IO. These facts are further reinforced by applying topicalization in passive causative constructions. With a 3 to 1 passive, the cooccurring final 2 can be topicalized.

(2) g. \[\text{bîbhôdô Tôzf ú-îł-gèz-îs-w-è ngû mákè} \]
\[\text{pot SC-OC-wash-caus-pass-tns by mother} \]
'the pot, Tozi was made to wash it by mother'

In contrast, the putative IO which is final 3 in a 2 to 1 passive construction cannot be topicalized:

(2) h. *Tôzf bîbhôdô îf-gèz-îs-w-è ngû mákè
'Tozi, the pot was made to be washed by mother'

And, of course, neither can we topicalize the final 2-chômeur when Tôzf advances from an initial 3 to a final 2 in the active causative counterpart, as seen in (2i) (cf. (1h)):

(2) i. *îbîbhôdô mákè ú-m-gèz-îs-è (Tôzf)
'the pot, mother made her wash (Tozi)'

Thus far, we have shown topicalization as a good test for the inoperativeness of the 2-chômeur and, conversely, its functioning on final 2 and not on final 3.

Turning to relativization, we will observe that it operates on final 2 as well. According to the accessibility hierarchy, if this is the case, then final 1's also relativize. In contrast, final 3 and final 2-chômeur are banned from this process. For example:

(1) j. \[\text{bânànà ūmúntfù lâ-wû-nîk-è sînînî ú-lângîlîlè (RM = relative} \]
\[\text{man RM-OC-give-tns friend SC-good marker} \]
(lit.) 'the banana which the man gave-it to a friend was good'
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k. ūmúntfù lọ-ník-è sínínì bànnànà ú-lúngǐlè
   man RM+SC-give-tns friend SC-good
   'the man who gave a banana to a friend was good'

l. *sínínì ūmúntfù lá-wù-ník-è bànnànà sí-lúngǐlè
   'the friend who the man gave-it a banana was good'

Without the distinction between IO and DO, the difference between the grammaticality of the sentences above cannot be accounted for in a simple, natural way.

In cleft constructions, the two unmarked NP's behave in the same way as in the relativized ones. Easily, final 2 as well as final 1 may be clefted, but not a final 2-chômeur, as in the following:

(1) m. ngú bànnànà là-wù-ník-è sínínì Jóhn
   'it was a banana that John gave to a friend'

n. *ngú bànnànà là-sì-ník-è Jóhn (sínínì)
   'it was a banana that John gave-him (friend)'

With a corresponding low tone on the clefted element below, the putative initial IO, sínínì is preferred to cooccur with the passive verb form (initial 3 to final 1) as follows:

(1) o. sínínì lè-sì-ník-w-è bànnànà ngú Jóhn
   'it was a friend that was given a banana by John'

However, the following form, where sínínì takes OC, i.e. with 3 to 2 advancement, is also acceptable, but certainly not if it is a final 3:

(1) p. sínínì là-sì-ník-è bànnànà Jóhn
   'it was a friend that John gave a banana to'

q. *sínínì là-wù-ník-è Jóhn (bànnànà)
   'it was a friend that John gave-it (banana) to'

Thus we have shown evidence that topicalization, relativization, and clefting may operate on a final 2 but not on a final 3 nor a final 2-chômeur.
2. **Oblique Advancements**

Three other types of structure that may consist of two unmarked nominals following the verb have a Ben(efactive), a Loc(ative), or a G(oal) cooccurring with a DO. They appear in the IO position. Unlike the Ben, which is always unmarked, the Loc and the G nominals may be identified by the markers *e*- *eni* and *ku-*, respectively. In the subsequent sections, we will determine the characteristics of each of these nominals, when occurring marked, in terms of functioning as an IO or a DO. One other oblique nominal which may be of interest for comparative purposes with other Bantu languages is the Ins(trumental) marked by *ng-e-*. This nominal usually occurs in its unmarked form. However, there is a structure which contains two unmarked nominals, one of which appears to have originated from an initial Ins. This will be discussed briefly in a later section.

2.1. **Ben nominal.** The Ben nominal is closely associated with the IO, not only in being unmarked, but also in occurring immediately after the verb. The formal difference between the two, however, is the presence of the affix *-el-,* in the verb whenever a Ben NP occurs. Compare (1) and (1a) with the following:

\[(4) \text{Índvùnà f-yà-kh-éì-è bántù (íhhòlà)}
\]

'chief SC-OC-build-ben-tns people hall'

The chief built a hall for the people'

Because of this difference, Frantz [1984] suggested that in Chi-Mwi:ni the registration of a similar benefactive affix in the verb denotes the advancement of the initial Ben to final 2. In SiSwati, I propose that, since the Ben behaves like an IO, and its cooccurring DO is not a 2-chômeur until the former takes an OC, the Ben advances to term 3. As such, it manifests the properties of IO's discussed previously, namely, (a) advancement to 2, thus triggering OC, and (b) advancement to 1 while still cooccurring with a final 2. For example,
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(4) a. Ben to 3 to 2
   Indvunâ f-bâ-kh-êl-ê fhhola (bântfù)
   SC-OC-build-ben-tns hall people
   'the chief built them (people) a hall'

b. Ben to 3 to 1
   bântfù bâ-ya-kh-êl-w-ê yl-Indvunâ (fhhola)
   people SC-OC-build-ben-pass-tns by-chief hall
   'the people were built it (hall) by the chief'

Again, when initial 2 advances to 1, the Ben as a final 3 cannot take OC as shown by the following:

(4) c. *fhhola f-bâ-kh-êl-w-ê yl-Indvunâ (bântfù)
   hall SC-OC-build-ben-pass-tns by-chief people
   'the hall was built for them (people) by the chief'

The other tests for DO-hood may be applied to the initial-final 2 and the results will all be grammatical. Now, if we adopt the same 3 to 2 advancement for the initial Ben, we get the following constructions showing topicalization, relativization, and clefting:

(4) d. Topicalize on Ben to 3 to 2
   bântfù Indvunâ f-bâ-kh-êl-ê fhhola
   people chief SC-OC-build-ben-tns hall
   'the people, the chief built them a hall'

Note that where fhhola is initial-final 2 (may take OC -ya-), bântfù as a final 3 cannot be topicalized.

Relativizing on either a Ben to 3 to 1 or a Ben to 3 to 2 is acceptable, but not on a Ben to 3.

(4) e. ngi-bon-ê bântfù Indvunâ le-bâ-kh-êl-ê fhhola
   I-see-tns people chief RM+SC-OC-build-ben-tns hall
   'I saw the people that the chief built a hall for'

To be able to undergo clefting, the initial Ben has to be either a final

5Henceforth, consider similar transitions as an abbreviation of two advancements, e.g. Ben to 3 and 3 to 2.
1 or a final 2. Thus, with a low tone on bantfu, we get:

(4) f. bántfu là-bà-kh-él-w-è íhhòlà yl-indowúnà
   people RM-SC-build-ben-pass-tns hall by-chief
   'it is the people that were built a hall for by the chief'

   g. bántfu índvúnà ló-bà-kh-él-è íhhòlà
   people chief RM-SC-OC-build-ben-tns hall
   'it is the people for whom the chief built a hall'

The behaviour of final 2 in (4f) may be confirmed by its ability to take -ya- OC and that of final 2-chômeur in (4g) by the inadmissibility of a corresponding -ya- OC.

The absence of a structure without a Ben to 3 advancement creates some doubts as to the validity of an obligatory Ben to 3 rule. Moreover, the intermediate transition of the Ben to 3 appears to be superfluous. In fact, there is no evidence against a direct Ben to 1 or Ben to 2 advancement, except that as we will see in the next section, assuming the intermediate transition, Ben to 3, simplifies the account of the Ben and unifies it with the two other Oblique nominals, Loc and Goal.

2.2. Loc and Goal nominals. The two marked oblique nominals, exemplified below, are the Loc with the affix e- -eni and the Goal with ku-. Both are similar to the Ben in their related unmarked structure in that they also take the position of the IO when cooccurring with a DO.

(5) ngĩ-bhàdãl-è ímàãl é-síkòl-w-ènì
   I-pay-tns money to-school
   'I paid money to the school'

(5) a. ngĩ-(yl)-bhàdãl-è sìkòlò ímàãl
   I-(OC)-pay-tns school money

(6) Jôhn ú-tsèmbfs-è úmsèbéntì kú Bìl
   SC-promise-tns job to
   'I promised a job to Bill'

(6) a. Jôhn ú-(wù)-tsèmbfs-è Bìl úmsèbéntì
   SC-(OC)-promise-tns job
Examples (5a) and (6a) are thus two further instances of superficial ditransitive constructions with two unmarked nominals. RG accounts for these structures by applying the Loc/Goal to 3 advancement rule, where initial 2 remains as a final 2. From this derived structure, all other structures discussed previously follow naturally. As final 2's (from a 3 to 2 advancement), the Loc/Goal takes OC, as in the following:

(5) b. ngí-sí-bhàdál-è f'mài (-síkòlò)
   I-OC-pay-tns money school
   'I paid it (school) some money'

(6) b. Jòhn ú-m-tsèmbís-è úmsèbèntì (Bìll)
   SC-OC-promise-tns job
   'John promised him (Bill) a job'

As with the previous final 3's, these two nominals may also passivize via the 3 to 1 advancement rule and, likewise, maintain the cooccurring initial-final 2. However, they differ from the Ben in being able to undergo topicalization as final Loc/Goal. Other than this, advanced Loc/Goal to 3 to 2 may also be relativized and clefted.

2.3. Ins nominal. The Ins nominal is a curious grammatical relation. Unlike Kinyarwanda and Chi-Mwini, the typical Ins nominal in SiSwati appears only in the oblique form marked by nge-, as in the following:

(7) a. úmfàtì ú-sík-è ínyàmà ngè-mèsè
   woman SC-cut-tns meat with-knife
   'the woman cut the meat with the knife'

   b. *úmfàtì ú-sík-è ínyàmà mèsè

However, for the purposes of this paper, we will consider a type of structure found in SiSwati which appears to share some features with the typical Ins nominal in the two Bantu languages mentioned, as exemplified below:

(8) ngí-gcòbís-è úmtímbà ngè-èmáfútsà
   I-smear-tns body with-oil
   'I smeared the body with oil'

(8) a. ngí-wù-gcòbís-è ngè-èmáfútsà (úmtímbà)
With úmtìmbà as the only unmarked nominal occurring immediately after the verb and having the potential to trigger OC, this nominal qualifies as an initial-final 2 in (8) and (8a). In the following sentence, we find émàfútsà unmarked, giving two unmarked nominals after the verb:

(8) b. ngf-gcobís-è úmtìmbà émàfútsà
   I-smear-tns body oil
   'I smeared oil on the body'

Since (8b) is perceived as being semantically equivalent to (8) or (8a), RG can account for (8b) as an instance of Ins to 2 advancement, supported by the alternant verb form containing its corresponding -wa- OC. One predictable consequence of this advancement is the possibility of this final 2 undergoing passivization. With Ins to 2 to 1, the cooccurring initial 2 cannot take OC.

(8) c. émàfútsà á-gcòtjís-w-è úmtìmbà ngì mì
   oil SC-smear-pass-tns body by me
   'the oil was smeared on the body by me'

   d. *émàfútsà á-wù-gcòtjís-w-è ngì mì (úmtìmbà)

This indicates that the initial DO in (8c) and (8d), úmtìmbà, is not a final 2. By the Chômeur Law, it should become a 2-chômeur when Ins advances to 2. However, this term continues to be accessible to passivization as in:

(8) e. úmtìmbà ú-wà-gcòtjís-w-è ngì mì (émàfútsà)
   body SC-OC-smear-pass-tns by me oil
   (lit.) 'the body was smeared it (oil) by me'

As has been suggested in previous works [Perlmutter and Postal 1983, Frantz 1984], initial 2 does not become a 2-chômeur in this case, but retreats to 3. As a term 3, it can advance to 1, as shown previously. As (8e) shows, final 2 (from Ins) is still a 2 as evidenced by -wa- OC. Sentence (8c), therefore, may be accounted for by saying that initial 2 retreats to 3 when Ins advances to 2, and then in the final stratum, 2 advances to 1. This structure has no final 2 to trigger OC.

While the above rules appear to account adequately for the forms so far treated, we have further the uncanny situation in which the initial 2, after
the Ins advances to 2, continues to behave like a final 2 in terms of allowing OC registration:

(8) f.  ngí-wù-gcòbís-è émàfútsà (úmtímbà)

Compared with (8a), (8f) seems to have frozen the initial 2 to a final 2, even after Ins to 2 advancement. Curiously enough, while it seems possible to take initial 2, which retreats to 3 when initial Ins advances to 2, back to final 2 via the available 3 to 2 advancement rule discussed earlier, this account appears to be counterintuitive. A more plausible analysis of (8b) is to relate it to structure (8g):

(8) g.  ngí-gcòbís-è émàfútsà émtímbènì
I-smear-ns oil on-the-body

'I smeared oil on the body'

Here émàfútsà is initial 2 and émtímbènì is initial Loc. With Loc to 3 advancement, we get (8b), which manifests the consequent deletion of the Loc marker e- -eni leaving úmtímbà and its shift in the IO position. With this analysis, (8c)-(8f) may now be explained as following naturally from the advancement rules, namely, 2 to 1, 3 to 1, and 3 to 2. And from these structures topicalizing, relativizing, and clefting on final 2, but not on a final 2-chômeur nor on final 3 can be confirmed.

From the above data, we can conclude that SiSwati differs from other Bantu languages in treating its Ins nominal only as a marked form. Finally similar to Loc and Goal, it may also be topicalized as a final Ins.

3. Summary and Conclusion.

In support of the IOA, SiSwati has been shown to employ the following revaluation rules in RG: (a) 2 to 1 and 3 to 1 advancement (passivization) and (b) Ben/Loc/Goal to 3, and 3 to 2 advancements. Moreover, the syntactic phenomena investigated show that they operate as follows: (a) OC registration triggered by final 2; (b) Topicalization on final 2 (and on marked non-terms); (c) Relativization and clefting on final nuclear terms. Evidently, the grammar of SiSwati regards nuclear terms very highly to the extent that it provides specific rules whereby other nominals can also optionally func-
tion as nuclear terms. However, when two or more nominals appear to exhibit the same grammatical function, the grammar need not recognize one and the same relation for the cooccurring nominals in a clause at all levels of analysis. Positing an initial IO different from an initial DO not only simplifies the account for the above processes but also unifies the syntactic behaviour of the Ben/Loc/Goal with the IO. Furthermore, by maintaining a distinction between IO and DO based on the arguments presented, we are able to explain (i) the ungrammaticality of a final 3 taking OC when initial 2 advances to 1, and the grammaticality of a final 2 taking OC when an initial or an advanced 3 advances to 1; and (ii) the ungrammaticality of final 3 taking OC where the cooccurring DO is topicalized, relativized, or clefted and, conversely, the ungrammaticality of final 2-čômeur taking OC where the putative 3 to final 2 is topicalized, relativized, or clefted.

At least for SiSwati, the above syntactic phenomena are better accounted for by the Indirect Object Analysis.
REFERENCES


THE MARGI VOWEL SYSTEM AND LABIOCORONALS

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The vowel system of Margi, described by Hoffman [1963] as containing three high vowels and one low vowel, is reinterpreted as a two-vowel system with underlying contrast only of high versus low. A pervasive contrast of secondary articulations on consonants spreads features of rounding and backness to contiguous vowels, giving rise to the different high vowel qualities recognized by Hoffman. A morphological role for the secondary articulations can be identified. Given this new understanding of the vowel system, the claim that "labio-coronal" elements in Margi are single complex segments requires re-evaluation. Arguments advanced by Sagey [1986] are shown to proceed from a wrong interpretation of a syncope process and an assumed underlying contrast between high vowels. Phonetic data and the absence of phonological arguments to the contrary suggest that the labiocoronal elements are consonant sequences.

1. Introduction

The languages of the Bura-Margi subgroup of Chadic have achieved a certain notoriety among linguists for their supposedly complex consonantal inventories. Their chief claim to fame comes from the fact that they have been reported to have unitary segments which combine a bilabial articulation with an alveolar or palatal one ("labiocoronal"). However, these languages also have vowel systems with rather interesting properties. We will show below that Margi is appropriately analyzed as having an underlying contrast of only low vs. high in its vowel system. This understanding of the vowel system throws new light on the question of the analysis of the labiocoronal elements as units or as consonant sequences. The reanalysis also brings into focus similarities in the vowel systems of Margi and certain other Chadic languages.
The source of the data to be analyzed here is Hoffman's *Grammar of the Margi Language* [Hoffman 1963], which is the basis of the numerous secondary studies of points in Margi phonology.\(^1\) Paragraph numbers cited in this paper refer to the paragraphs of Hoffman's book. I have also listened to recordings of two speakers producing examples of phonological contrasts selected from Hoffman for Ladefoged's *Phonetic Survey of West African Languages* [Ladefoged 1968].

2. The Margi Vowel System

2.1. Secondary articulation and vowel distribution. The vowel system of Margi is given by Hoffman as including six contrastive vowels, i, a, u, e, o, a. It should be noted that "a" is used here, as by many other Chadic scholars, to represent a high central vowel which might otherwise be represented by [ɒ]. The two mid vowels e, o occur only in a few recent loanwords and as occasional simplifications of sequences which Hoffman writes ia and wa or ua respectively. A reinterpretation of these sequences will be given below. In view of the marginal status of mid vowels, they will be ignored in the following discussion. Hoffman suggests that the remaining four vowels, low a and high i, a, u are phonemic. In a reanalysis of Hoffman's material, Schuh [1971] noted some redundancies in the distribution of the high vowels and argued that only a, i, u are really contrastive. He suggested that a can be regarded as an epenthetic vowel "needed solely to preserve proper syllable structure" when no other vowel appears in a position where a vowel is required. In fact, the redundancies in high vowel distribution are more extensive than those which Schuh noted, allowing an analysis to be made in which there is only a contrast of low vs. high vowels. While one of these vowels could be regarded as completely underspecified (Pulleyblank [1986], Archangeli & Pulleyblank [1986], Steriade [1987]), we will show below that the vowel position itself is not predictable. We will show that these two underlying vowels both va-

\(^1\)Additional primary data would be highly desirable on a number of points, but is unfortunately not available to the author at this time.
ry quite considerably in quality, depending on their environment. Hoffman and Schuh both treat much of the high vowel variation as phonemic, but consider the low vowel variation to be allophonic.

We will begin our presentation, as Schuh does, with the situation after velars. Velar stops and fricatives occur in plain, labialized, and palatalized, i.e. fronted, variants before the low vowel. Examples are given in (1). We use superscript w and y to indicate labialization and palatalization.

(1)

<table>
<thead>
<tr>
<th></th>
<th>plain</th>
<th>labialized</th>
<th>palatalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>voiceless stop</td>
<td>kàkàdè 'book'</td>
<td>kwàkwa 'impotent person'</td>
<td>kyàr 'tongue'</td>
</tr>
<tr>
<td>voiceless</td>
<td>gà 'and'</td>
<td>gwà 'enter'</td>
<td>gyàpè 'both'</td>
</tr>
<tr>
<td>fricative</td>
<td>xá 'waterpot'</td>
<td>xwà 'boil'</td>
<td>xyà 'moon'</td>
</tr>
<tr>
<td>voiced fricative</td>
<td>yà 'put on'</td>
<td>ywà 'reach inside'</td>
<td>gyàdè 'pick up'</td>
</tr>
</tbody>
</table>

We take these examples as providing prima facie evidence that labialization and palatalization are contrastive features of the Margi consonant system (at least for velars). Although the low vowel is written with a single symbol a, Hoffman reports that it is fronted to [æ] in the environment of the palatalized velars and is backed and rounded to [n] with labialized ones (118). Hence, we see that these secondary consonantal articulations have considerable influence on vowel quality. As for the high vowels, Hoffman largely writes only i after palatalized velars, only ø or u after plain velars and no high vowels at all after labialized velars. What Hoffman regards as "plain" velars before u are actually produced with rounding. Given these phonetic facts and distributional limitations, we can interpret the three syllables in (2a) as having the same underlying high vowel, but as differing by the secondary articulation of the consonant. The secondary articulations result in allophonic variation of this high vowel parallel to that noted for the low vowel, i.e. their underlying forms can be written as in (2b):
The analysis of such forms as having a secondary articulation contrast rather than contrasting vowels is more than simply a way of expressing distributional redundancies. Examination of suffixation processes where the suffix begins with a low vowel show that it can be motivated by rule generality. One relevant suffix is the definite marker -ārl which can be added to most nouns (§71-8). Before this suffix, a final vowel is elided, as in (3).

(3) fá 'year' + ārl = fārl
mālā 'woman' + ārl = mālārl
sē 'thing' + ārl = sārl
mēlmē 'village' + ārl = mēlmārl

Let us now examine some words with velar consonants. If we assume the words in (4) have the structure that we assign them in the first column, all the suffixed forms in both (3) and (4) are directly produced by deleting the final vowel and adding the suffix. If we assume these words have the forms in the second column, as given by Hoffman, then exceptionally u is not deleted but instead is desyllabified, or causes a secondary articulation to remain on the consonant as it is deleted; no simple and general rule can be formulated to cover all the suffixation cases.

(4) xvā 'dog' xvā + ārl = xvārl
kYō 'compound' kYī + ārl = kYārl
kwā 'goat' kū + ārl = kwārl
xwā 'grave' xū + ārl = xwārl
tāgwē 'horse' tāgū + ārl = tāgwārl
blkē 'sin' blkē + ārl = blkārl

Let us assume that velars in general are characterized as [dorsal]; labialized velars have the additional feature [+round] and palatalized velars the feature [-back]. The quality of high vowels is then described by the same feature spreading rules that account for variation in /a/ . We may
write these rules quasi-formally as in (5).²

(5) a. \[ C \ V \]
   \[ \text{[dorsal]} \]
   \[ \text{[+round]} \]

b. \[ C \ V \]
   \[ \text{[dorsal]} \]
   \[ [-\text{back}] \]

Only an opposition of high vs. low vowel needs to be posited for these rules to generate all the correct vowel variants after velars, namely, for high vowels \([\theta, i, u]\), and for low vowels \([a, a, u]\).

Before turning to consonants at other places of articulation, it would be appropriate to discuss why an analysis with underlying secondary articulations on velar consonants is preferable to a possible alternative in which the secondary articulations are derived from neighboring vowels. This alternative would retain the assumption that there is an underlying contrast of front, central and back high vowels and posit rules which spread features from /u/ and /i/ to preceding velars to produce the rounded and fronted variants. Before low vowels, /u/ and /i/ would also spread features to the low vowel and desyllabify or delete. This analysis would posit underlying forms like (6a) in place of those given in (2b), and would posit the forms in (6b) in place of /ka/, /kw/ , and /ky/.

(6) a. \( k\theta \) \( ku \) \( ki \)

b. \( ka \) \( kua \) \( kia \)

Although this alternative results in positing a smaller set of consonant contrasts, it does so at the cost of increasing the vowel inventory and having a more complex set of rules. Moreover, all vowels in the larger inventory would have limited distributions: /u/ and /i/ but not /ə/ can appear before /a/; /a/ cannot precede any high vowel; /ə/ cannot appear

²For the sake of simplicity the feature [+round] is shown in (5) as attached below the [dorsal] node in the feature hierarchy [Clements 1985]. This should not be taken to indicate that this is its proper place in a fully developed representation. Neither should this representation be taken to imply a considered position that [round] is not a univalent feature which is present or absent, rather than a binary feature.
after /u/ or /i/; /u/ and /i/ cannot combine with each other in either order; there are no geminate vowels. While these restrictions are not hard to state, they do not form a coherent pattern. The permitted sequences are just those required to derive secondary articulations on consonants before low vowels and they never surface as actual vowel sequences. No statements restricting vowel co-occurrence are required under an analysis in which consonants bear contrastive secondary articulations and the canonical syllable has only a single vowel mora. Since Margi shows no evidence of being sensitive to moraic structure of the rhyme—unlike Hausa for example (Carnochan [1951], Newman [1972]) where a long vowel or diphthong may not precede a tautosyllabic consonant—the single mora account seems the appropriate one. Restriction to a single vowel mora naturally rules out all vowel sequences. The assumption that there is only a high/low vowel contrast accounts for the absence of the phonetic syllables *[kwi], *[kwa], *[ku], and *[ky] (as well as *[kw] and *[ky]).

We have shown a strong motivation for a reanalysis of the vowel system in connection with velar consonants. But this analysis would not be tenable if it did not also apply to consonants at other places of articulation. Hoffman recognizes a series of labialized labials before low vowels, e.g. in /bwa/ 'hip', /wa/ 'cook (v.)', /wa/ 'pool', /mwa/ 'friend'. These words also have the rounded ([a]) allophone of /a/ (§18). In Hoffman's notation, the labialized labials never occur before o or before u. Again, there is a distributional gap. By examining, for example, some verbal derivation patterns, we may see justification for analyzing syllables like those in (7a) as having the structure in (7b).

(7) a. [bu] [mu] [fu]
    b. /bwa/ /mwa/ /awa/

A transitive and usually benefactive verb can be derived from an intransitive by suffixing -ør. This suffix is seen in full after consonant final stems, as in (8a), but after stems with high vowels, the vowel before the /r/ has a phonetic shape which is consistent with the assumption that its quality is determined by contrastive labialization with labials, as in
(8b). After a labialized labial the vowel [u] appears, after a plain labial the vowel is [ə].

(8) a. ɓǝl 'break' ɓǝlɿǝrl 'break s.t. for s.o.'
    lǝm 'milk (v.)' lǝmɿǝrl 'milk for s.o.'

b. bǝ̀ [bù] 'boil' bǝ̀rɿ [bùɿ] 'boil (trans)'
    mbǝ̀ [mbù] 'sew' mbǝ̀rɿ [mbùɿ] 'sew for s.o.'
    fǝ̀ 'put on' fǝɿ 'put on'

This pattern does not determine for us if the stem vowel has been preserved, replaced by the suffix vowel, or if the two have coalesced. But it is clear that a phonetic string such as [bǝ̀rɿ] is not derived, when that would have been a possible outcome. These observations and the distributional facts suggest that labialized bilabials occur in Margi before both low and high vowels and that they determine the quality of contiguous vowels.

Can we complete the parallel with velars by showing that palatalized labials also occur? Hoffman does not recognize them in his phoneme inventory, but there are at least two indications that we should assume their existence. He does recognize a diphthong written 'ia', which he describes as "a close sequence of 'i' and 'a'" (§19). He writes only a single tone-mark for syllables with this diphthong. There are no other diphthongs whose first element is 'i'. And the vowel /a/ in this context has the same fronted allophone as appears after palatalized velars. Let us assume that when this diphthong appears after a labial, as in ɓiaɿia 'chaff', we have a palatalized labial before the low vowel ə, and when labials occur before i alone we have a palatalized labial before the single high vowel /ə/. What does this predict? Among other things, it would predict that a palatalized labial before the definite suffix -əɿɿ should behave like the velars in (4b), i.e. the final vowel of the noun will delete and the second-

3When the stem ends with a low vowel, the stem-final vowel remains. Taken together with the patterns seen with the əɿɿ suffix, this suggests that /a/ in general is the vowel which survives when two adjacent vowels of different height are reduced to one.
ary articulation on the consonant remain. This is what we see in examples like the word meaning 'water'. Hoffman gives the forms in (9a). His account is that the vowels i and a coalesce to form the diphthong ia (§38). But, in view of the behavior of the examples in (3) and (4), if /i/ at the end of 'water' was an underlying vowel, we would expect it to simply delete, yielding the definite form ?fmarl. We suggest the process is as shown in (9b), where the secondary articulation is retained on the consonant.

\[(9) \begin{align*}
  a. \text{?fm} \text{?} + -\text{arl} &= \text{?fm\text{?}arl} \quad \text{(Hoffman §74)} \\
  b. \text{?fmy} \text{?} + -\text{arl} &= \text{?fmy\text{?}arl}
\end{align*}\]

Since the behavior here is parallel to that of the velars, the assumption of contrastive palatalization of labials seems justified. Note that examples such as /b\text{?}k\text{?}/ in (4) above would thus be interpreted as /b\text{?}\text{?}k\text{?}/.

The remaining major place grouping of consonants are the coronals, i.e. alveolars and palato-alveolars. One might expect the palato-alveolars to be the palatalized counterparts of the alveolars. If we further assume that consonants have only one secondary articulation, then we would expect that while labialized alveolars would occur, there would be no labialized palato-alveolars. Hoffman includes labialized s\text{w} and t\text{w} before low vowels in his inventory of consonants in apparently monomorphemic words such as /s\text{w}\text{?}n/ 'femur' and /t\text{w}\text{?}n/ 'log', but no examples of labialized palato-alveolars. However, before high vowels we find both, say, /s/ and /\text{f}/ before u as well as /s/ before i. Alternations with the -\text{arl} suffix, as in (10), suggest that secondary articulations are to be associated with these consonants.

\[(10) \begin{align*}
  \text{t\text{?}v\text{?} [t\text{?}]} \quad \text{'mournig'} + -\text{arl} &= \text{t\text{?}v\text{?}arl} \\
  \text{pt\text{\text{f}w\text{?} [pt\text{\text{f}}\text{\text{u} [pt\text{\text{f}}\text{\text{w}arl}}
\end{align*}\]

We therefore assume that the contrast of plain, palatalized, and labialized also extends to alveolars in Margi. Note that we henceforth assume that the syllable [ri] is underlyingly /r\text{?}\text{e}/, so the suffix \text{4} we have been

\[\text{4There seem to be several common nominal and verbal suffixes ending}\]
hitherto writing as "-är'i will be written below as "-är'Ȳ'e.

Palato-alveolars may be contrastively labialized, but it is unclear if they can be contrastively palatalized. The vowel /ə/ appears as [i] before a palato-alveolar or after one, unless it is in utterance-final position. Thus /ʃə/ is phonetically [ʃi] everywhere except in final position, e.g. the reduplicated form of /ʃə/ 'spin' is [ʃʃə]. Thus in many positions there could be no contrast between, say /ʃ/ and /ʃY/, since the distinction would be neutralized. The pre-pausal allophone of /ə/ is actually a partly rounded central vowel which in a narrower transcription might be written [ɔ]. This allophone occurs in final position after palato-alveolars. But Hoffman also cites a few forms in which he writes ɪ in final position after a palato-alveolar consonant, such as ʃʃɪ 'hair'. If these are not errors, in which a non-final form was written in place of a citation form, then there is at least a limited contrast of palatalization with palato-alveolars. Whatever the solution to this problem is, we must represent the fact that their "plain" versions are in some sense inherently palatalized, e.g. they are underlyingly [-back], but differ from palatalized alveolars in not being [apical].

The three-way contrast between plain, palatalized and labialized also applies clearly to glottal stops. Hoffman partly noted this. In his list of consonants (§20), he includes glottal stop (?) as well as a "glottalized bilabial semi-vowel" (?w) and a "glottalized palatal semi-vowel" (?γ). He then comments that "while ? before a seems to be a phoneme by itself, ? before u and ɪ is an allophone of ?w and ?γ respectively". That is, there is no contrast between ?γɪ and ?i or between ?wʊ and ?u. Examples illustrating the secondary articulation contrast with /ʔ/ are given in (11), with Hoffman's forms in parentheses where they differ.

with what Hoffman writes as rɪ. The frequency of the vowel ᵐ after r in this position makes it seem likely that the front vowel quality could be predicted from some other principle, particularly since final ɪ in suffixes of this kind changes to ə or deletes in non-final positions (§37).
We thus see that at all major places of articulation in the Margi consonant system, the consonants may appear plain or bear a secondary articulation of palatalization or labialization. There are no contrasts between high vowels of different qualities. Instead, high vowel allophones are predictable from the secondary articulation phenomena. When this is understood, the distributional asymmetries between consonants and vowels reported by Hoffman are accounted for.

There remain, of course, a number of details which need to be worked out in the interpretation of the Margi phonological system. For example, the glides \( w \) and \( y \) clearly count as [+round] and [-back] respectively and these features spread to the following vowel, e.g. pre-pausal \( y \) 'love (v.)' is \( y \) in non-final positions. But it is not yet clear if their palatalized and labialized counterparts \( w^\gamma \) and \( y^\gamma \) would need to be posited, and, if so, how these would differ from each other. Hoffman does write syllables such as \( wi \) and \( yu \), which we might wish to interpret as perhaps \( /w\gamma\theta/ \) and \( /\gamma\theta\gamma/ \) (although there seem to be no underlying forms with \( yu \)). This notational distinction doesn't seem to have any meaningful interpretation, creating a problem for deriving the vowel qualities \( i \) and \( u \) after \( /y/ \) and \( /w/ \) by the same rules we have discussed. There are indications that \( /y/ \) and \( /w/ \) can appear postvocally; hence, the syllables \( wi \) and \( yu \) might also be considered to have the structures \( /w\gamma\gamma/ \) and \( /\gamma\gamma\gamma/ \), with the vocalic quality occurring through anticipation of the final glide. A relevant item to consider is the word for 'tail', given by Hoffman as \( [\acute{u}] \), as shown in (12). Unlike previously cited examples, this word does not delete its vowel before the \( -\acute{\gamma}\theta \) suffix.

(12) \( [\acute{u}] \) 'tail' + \( -\acute{\gamma}\theta = [\acute{\theta}w\acute{\gamma}\theta]\ [\acute{\theta}w\acute{\gamma}\theta] \)

By positing a postvocalic \( /w/ \) in its underlying form, we account for the unexpected behavior of this word. But because the data is incomplete it is
unclear if the wi and yu syllables can be shown to have a motivated interpretation as /wəy/ and /yəw/.5

Note that although /ʃ/ is followed by [u] in (12), the consonant is not marked as labialized. We do not need to assume that the prevocalic consonant has distinctive labialization if the [+round] value of the /w/ is spread back to the vowel which precedes it. This kind of anticipatory assimilation can be readily found elsewhere in Margi. We observe alternations between o and u across word boundaries when a [+round] consonant follows the word boundary, as in (13a), and in derivational processes such as those creating abstract nouns with the suffix /kʷər/ ([kûr]) in (13b).

(13) a. ãnõ + ŋkʷə → [ãnû ŋkʷə] 'for daughter'
dè + wâgə → [dû wâgə] 'in the evening'

b. mdè + kʷə → [mdûkûr] 'friendliness'
bêlêkè + kʷə → [bêlêkûkûr] 'ignorance'
yə + kʷə → [yûkûr] 'love'

In the examples in (13a) Hoffman sees the o vowels as being influenced by the labialized (or labial-velar) consonant which follows across the word boundary; in (13b) he sees the vowels as being influenced by the rounded vowel in the derivational suffix. In our view, both sets of examples in (13) illustrate a single process, namely, that a high vowel before a labialized consonant may become rounded by anticipation of the labialization of the consonant. Note that what Hoffman writes as u after y in the word for 'love' in (13b) is actually a high front rounded vowel which he says is similar to the French or German vowel ü (IPA [y]). In other words, this vowel takes on the palatal quality of the preceding consonant and the labial quality of the following /kʷ/. The vowel u in /ʃəw/ 'tail' has a similar quality (§18). These facts provide support for interpreting a possible syllable yu in isolation as /yəw/.

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5See footnote 7 for evidence that some non-glide consonants which are both labialized and palatalized may be derived in Margi. These are not ambiguous in the way that wV and yW are, hence they do not provide a problem for our analysis.
A parallel anticipation of frontness also occurs before palatalized con-
sonants, although this process is obscured by Hoffman's transcriptional
practices. He notes that before palatalized velars, palato-alveolars, and
γ the vowel α "resembles a short open \( i \) [as in] English bit" (§18).
This is the same allophone that he gives for his "phonemic \( i \) in word-
medial positions. But he continues to write α in these contexts, whereas
after palatalized velars, palato-alveolars, and γ he writes \( i \), not α.
The spreading rules in (5) above can be revised to describe both anticipa-
tion and perseveration, as in (14). The rules are also simplified to elim-
inate their restriction to dorsal consonants.

(14) a. \[ V \quad C \quad V \]
     \[ [+\text{round}] \]
     \[ [-\text{back}] \]

2.2. Morphological arguments for a reduced vowel inventory in Margi. Al-
though the interaction of secondary articulation and vowel qualities pro-
vides the principal basis for positing a reduced vowel inventory in Margi,
there are some morphological arguments which support this analysis. Hoff-
man notes that the majority of verb stems begin with a consonant but a few
begin with the vowels \( i \) or \( u \) whereas "there are no examples for verb
stems beginning in \( a \) or any other vowel" (§211). In other words, verb
stems do not begin with \( α \) or \( a \). This restriction receives an explana-
tion if we assume that Hoffman's "vowel initial verbs" actually begin with
underlying /\( yα \)/ or /\( wα \)/. Note that in non-final forms where the phonet-
ic quality of /\( α \)/ has not been affected by a following consonant's second-
ary articulation to produce a front rounded vowel, the glide + vowel se-
quencies /\( yα \)/ and /\( wα \)/ can be heard simply as \([i]\) and \([u]\). A good
example is provided by the first person singular subject pronoun. In final
suffix position this is \( [yα] \), but in prefix position it is \([i]\) (§112-
113) unless the verb stem is preceded by /\( α \)/ as in the "short subjunctive"
when it will surface simply as \([γ]\) (§333). All verb stems thus begin
with consonants, and the absence of initial \( α \) or \( α \) is a consequence of
that requirement. It is still true that the set of verbs which Hoffman re-
gards as vowel initial behave differently from other verbs. For example, the final vowel of a tense/aspect marker ending in /-a/ is deleted when it precedes these verbs, but not otherwise. The class is still well-defined as it is the class of verbs which begins with a glide followed by the high vowel /a/.

More fundamental are the processes I will refer to as morphological palatalization and labialization. These are derivational processes which Hoffman describes as involving suffixation with /-īa/ and /-wā/ respectively (§220, §240). The first gives a more completive meaning to the verb, the second generally involves an idea of separation. Hoffman's descriptions of the processes are fairly complex and not always observationally correct. If they are reinterpreted as involving palatalization or labialization of the final consonant in the stem, and replacement of the final stem vowel with /-a/, a simpler and more explanatory account is obtained. We will simplify our discussion by remaining silent on some differences in the tonal patterns of the two processes.

Some examples of verbs which undergo both of these processes are given in (15).

(15)  
<table>
<thead>
<tr>
<th>Simple stem</th>
<th>Palatalized form</th>
<th>Labialized form</th>
</tr>
</thead>
<tbody>
<tr>
<td>b̰̯ə̀   'forge'</td>
<td>b̰̯ə̀ya'</td>
<td>b̰̯ə̀wa' 'forge x instead of y'</td>
</tr>
<tr>
<td>fə̀ 'put'</td>
<td>fə́ya'</td>
<td>fə́wa' 'put into'</td>
</tr>
<tr>
<td>pə́ə̀ 'break'</td>
<td>pə́ə́ya'</td>
<td>pə́ə́wa' 'break in two'</td>
</tr>
<tr>
<td>ə́ 'cut'</td>
<td>ə́ya'</td>
<td>ə́wa' 'cut in two'</td>
</tr>
<tr>
<td>ntə́ 'split'</td>
<td>ntə́ya'</td>
<td>ntə́wa' 'split in two'</td>
</tr>
<tr>
<td>tsə́xə́ 'sweep'</td>
<td>tsə́xə́ya'</td>
<td>tsə́xə́wa' 'sweep together'</td>
</tr>
</tbody>
</table>

A further set of examples which Hoffman only cites as undergoing the palatalization process is given in (16).

(16)  
<table>
<thead>
<tr>
<th>Simple stem</th>
<th>Palatalized form</th>
</tr>
</thead>
<tbody>
<tr>
<td>tsə́wə́i [tsə́wə́]</td>
<td>tsə́wə́ya' 'incise' (tsə́wə́a)</td>
</tr>
<tr>
<td>də́gə́i [də́gə́]</td>
<td>də́gə́ya' 'attack' (də́gə́a)</td>
</tr>
</tbody>
</table>
simple stem | palatalized form
---|---
ŋà | 'bend'
ŋyà | 'bend down'
ŋyà [ŋyì] | 'burn'
ŋyà | 'fire (pottery)'
tʃá [tʃì] | 'hem'
tʃá | 'hem'

Hoffman's description of the suffixation with /-fa/ involves essentially three processes: deletion of final a before adding /-fa/ , e.g. 'cut' or 'split' in (15); changing of final u to w, e.g. 'incise' and 'find' in (16); and "if /-fa/ happens to follow after a velar", palatalization of that velar, e.g. 'bend' in (16). He does not mention that a is deleted also. Our account of these facts is that the morpheme in question consists of a floating [-back] feature, which docks to the last consonant in the stem, and a low vowel, which replaces the final vowel (if any) or is suffixed to stems which end in a consonant. Final u does not occur except after a labialized consonant, so rather than the vowel changing into w, what we see is the retention of the [+round] feature of the consonant. It may also be significant that only one of Hoffman's examples of verbs which undergo this process has a stem-final vowel which he regards as phonemic i, i.e. has a last consonant which is palatalized. We think it likely that such verbs rarely undergo this process because their derived forms would be homophonous with verbs with the corresponding plain consonant.  

The process involved in the labializing derivative is similar. A final stem vowel is replaced by /a/, and a floating [+round] feature docks to the last consonant of the verb stem, as the examples in (15) illustrate.

---

6Note that verbs with palato-alveolar consonants are not prevented from undergoing the process. These consonants do not have an underlying contrast with respect to the feature [back], as noted above. Hence, although docking [-back] to these consonants is vacuous, no underlying contrast between different verb stems is obscured by the derivation process. The examples that Hoffman gives all have high vowels, hence the derived form differs from the simple verb stem in that a low vowel occurs after the palato-alveolar consonant.

7It may also be the case that these processes derive some consonants which are both labialized and palatalized, as in the case of the labialized derivative of the verb ŋàxə 'trample', ŋàxə 'trample to bits'. We
In some derived disyllabic forms the effect of the [+round] feature spreads into the syllable preceding the last consonant. Examples are given in (17).

(17) simple stem     labialized form
    bdól 'lock'      bdólwa [bdúlwa] 'set (bone)'
    ntéká 'divide'   ntéká [ntúká] 'divide in two'
    ból 'break'      bólwa [búlwa] 'break in two'

These forms provide further evidence that the vowel quality u may result from assimilatory influence on a high vowel from a following labialized consonant as well as from a preceding one. This anticipatory influence is apparently less regular than the perseverative one. Hoffman's data does not make clear if it is an optional process or if the cases he cites are lexically restricted. Whichever is the case, what is important is to note that a phonetic string such as [ntúkwa] might have either of the structures shown in (18).

(18) [ntúkwa] → a) ntúkwa or b) ntukwa

2.3. Parallels with other Chadic languages. Restricted vowel inventories and morphological processes involving "floating" palatalization and labialization are not isolated phenomena in Margi but recur in a number of other Chadic languages. Among the closer relatives of the Bura-Margi cluster within Central Chadic, both Higi [Mohrlang 1972] and Gude [Hoskison 1974] have vowel systems with major similarities to Margi. Only a high/low contrast is observed for medial vowels in Higi and for vowels in any position in Gude. Phonetic vowel quality varies considerably under the influence of properties of neighboring consonants in both languages, being fronted in the environment of palatalized consonants and rounded in labialized environments. Hoskison also notes two verbal processes involving morphological

will not elaborate on this possibility at this time since it goes beyond the central points of this paper.
palatalization in Guê. One, which derives a verbal form indicating motion toward the speaker, replaces the stem final vowel with a low vowel and docks palatalization on the nearest stem consonant with the highest ranking on an eligibility scale. Morphological palatalization is also described for Zulgo [Haller 1980] and Podoko [Jarvis 1981]. Among West Chadic languages, Bade and Ngizim have only a high/low vowel contrast, at least in medial position [Schuh 1978]. Again, phonetic vowel quality is determined by consonantal environment. Miya [Schuh 1987] also has only a high/low vowel contrast. Morphological palatalization is a major process in deriving deverbal nouns in this language, though, unlike Guê (and Margi), it may affect more than a single consonant. Although morphological labialization is less commonly reported, it occurs in Mofu according to Schuh's reanalysis of Barreteau [1978].

These similarities show that Margi is not an unusual language within the context of Chadic. In fact, a relatively restricted vowel inventory is broadly characteristic of the entire Afro-Asiatic language family.

2.4. Underlying vowel positions in Margi. In view of the proposal by Schuh [1971] that the presence of a can be predicted in Margi, we will briefly review the evidence for considering the vowel position occupied by high vowels to be underlingly present. (Schuh's arguments for Margi are similar to those presented for Ngizim and Bade in Schuh [1978]). Schuh suggests that a vowel is epenthesized to break up unacceptable consonant clusters. In most cases this means that a vowel must be inserted after every obstruent. Sonorants in final position do not require a following vowel, unless they are the only consonant. These rules predict that there should be no words that contrast either in presence or absence of initial high vowels or in presence or absence of high vowels following sonorants. But such cases do occur: examples are given in (19).

(19) Unpredictability of initial and final high vowels

<table>
<thead>
<tr>
<th>initial high vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>èmtèl</td>
</tr>
<tr>
<td>mtiègè</td>
</tr>
<tr>
<td>èmpｙè</td>
</tr>
<tr>
<td>mpyè</td>
</tr>
</tbody>
</table>
The Margi Vowel System and Labiocoronal

We may further note that *màmà 'honey' reduplicates as *màmàmàmà but *dàm 'pick (v.)' as *dàmdàm; *wèlè 'look' as *wèləwèlə (→ [uːlʊl]) but *wèl as *wèl?wèl (→ [uːlʊ]) . These forms seem to suggest that vowel positions cannot be predicted simply from the input string of consonants in Margi.

3. Labiocoronal

We are now in a position to discuss how far the new understanding of the nature of the Margi vowel system contributes to answering questions about the nature of the "labiocoronal" elements. Hoffman wrote (§24):

"A peculiar feature of Margi as well as the whole Bura-Margi group ... are the labial-alveolars, which in this respect are comparable with the labio-velars of so many languages in the West Sudan. That these labio-alveolars (and the labio-alveopalatals) are simple phonemes and not casual juxtapositions of two separate phonemes can be concluded from their behaviour in reduplications."

The view that the elements in question are single segments was accepted by Ladefoged [1968] and has been widely repeated by others, e.g. Chomsky & Halle [1968], Newman [1977]. Margi was cited by Halle [1983] as the prototypical language having segments with simultaneous labial and coronal articulation. Based on phonetic and phonological data drawn principally from Bura I have argued [Maddieson 1983] that these Chadic languages do not have complex segments of this type. Instead, these elements are sequences, that is, they consist phonetically of a sequence of a labial and a coronal articulation and phonologically of two separate feature matrices or trees linked to separate slots in the CV (timing) skeleton. However, in her recent dissertation from MIT, Sagey [1986] argues that, the phonetic data notwithstand-
ing, there are phonological reasons in Margi to treat them as single segments. She used the convenient name "labiocoronal", proposed by Halle [1983], for these elements and I will continue this usage. Her argument that there are complex labiocoronal segments in Margi rests on two points: behavior in reduplication, a point mentioned but not elaborated by Hoffman, and word-internal syllable structure. The point has importance not only for the phonology of Margi and related Chadic languages, but also has ramifications for the structure of phonological feature systems. If Sagey's arguments can be sustained, then phonological theories must certainly be formulated so that labiocoronal segments are accounted for. If not, then, at the least, some other language than Margi would need to be shown to have "labiocoronal" segments before they should be recognized in theoretical models.

3.1. Reduplication. First let us examine the question of reduplication. Margi makes quite extensive use of initial reduplication in its verbal morphology. Reduplication also occurs to a lesser extent in the numeral and nominal systems. I argued in my earlier paper that reduplication could not decide the question of one vs. more segments in Margi (or Bura). This was because in the process Hoffman calls "complete reduplication" whole stems are reduplicated, and in the process Hoffman calls "partial reduplication" complete initial syllables are reduplicated. If this understanding of these patterns is correct, then reduplication provides no evidence for deciding whether the labiocoronal elements are being treated as single segments or as sequences, since in either case the entire onset to the initial syllable is reduplicated.

The verbal system of Margi uses reduplication to derive iterative verb forms from simple verbs, and to derive what Hoffman calls a participle. Although there are two different rules of reduplication, these two derivational processes are not distinguished by the type of rule used. Either may take the form of complete reduplication of the entire verb. Examples of complete reduplication are given in (20) as cited by Hoffman.
While agreeing that complete reduplication is irrelevant to the issue, Sagey correctly disputes the claim that partial reduplication of a stem involves the complete initial syllable. She points out that there are some basic forms of words in Hoffman's grammar which consist of or contain a syllable which is not fully reduplicated in the reduplication process. Examples are given in (21).

(21) base form                    reduplicated form

    iterative formation
    ṇël 'to abuse'                  ṇëłṇël 'to abuse many times'
    ndël 'to twist'                ndëndël 'to twist around many things'

    participial formation
    mwël 'sour'                    mwëlmwël 'sour, acid'
    sël 'fry'                      sësël 'fried'
    Ṉërzë 'roll s.o. on ground'   Ṉëlnërzë 'pushed along on ground'

In (21) only the syllable onset and nucleus reduplicate; the syllable-final consonant is not reduplicated. Since less than the full syllable is reduplicated the rule must refer to segments or syllable constituents, not the entire syllable. However, the examples in (21) could be described in two ways. Assuming that all of the syllable onsets in question (including pre-nasalized obstruents and consonants with secondary articulations) are single segments, partial reduplication could be formulated to generate a copy of the initial consonant and a vowel. Alternatively, it could be formulat-
ed to copy the syllable onset (which might contain a sequence of consonants) and the nucleus. If the rule is of the former type, it provides evidence for deciding if complex phonetic elements are single segments or clusters since these will be treated differently in the process. If it is of the second type, it does not provide such evidence. The data in (21) are not decisive and can be described as well by either type of rule.

Sagey believes the indeterminacy can be resolved by examining the interaction of a rule of syncope with the reduplication rule in question. The syncope process deletes a non-low vowel between a coronal consonant and a velar. (It also applies rarely between a labial and a velar, §39.) Some examples of the resulting alternations are given in (22):

(22) tôtèkú = tòtkú '(only) one'
Ôntsèkà = Ôntskà 'stone'
N'azègə?i = N'azgə?i 'a rat' (tone not marked by Hoffman)

Besides the word-medial consonant clusters in the syncopated forms in (22), this syncope rule also derives some initial consonant clusters. It is these which might provide the test cases to determine how reduplication applies to undoubted clusters. We can then see whether this is the same or different from the way that it applies to labiocoronals. Sagey argues that labiocoronals differ from the clusters derived by syncope precisely in that the derived clusters "reduplicate as clusters, while the labiocoronals reduplicate as single segments" (p. 178). Some reduplicated forms with labiocoronals are given in (23).

(23) base form reduplicated form
ôdê 'chew' bôdêdê 'chewed'
ptà 'be insufficient' ptàptà 'insufficient'
mn'â 'rebuke' mn'âmn'â 'rebuke very much'
bdzàl 'fry' bdzâbdzâl 'fried'
mtjâdê 'point' mtjâmtjâdê 'pointed'
mtsâkù 'pick up' mtsômmtsâkù 'pick up in many places'

Note that in these examples all prevocalic consonantal elements in the initial syllable of the base form are reduplicated. Most words with initial
labiocoronal elements are monosyllabic. When they have no final consonant, like the first three examples in (23), there is no direct basis on which to decide whether these are examples of complete or partial reduplication, since the results of either process would look the same. However, there are a few examples in which a postvocalic consonant is not necessarily copied, e.g. 'fry', as well as the two forms cited above which are bisyllabic. These can be more confidently seen as subject to partial reduplication and hence of relevance to the present discussion.

The two forms, cited as Hoffman gives them, which show the relationship of syncope with reduplication are given in (24).

(24) base syncopated form reduplicated form
sùkùdə 'push' skùdə sèsùkùdə 'push bit by bit'
tsùkwà 'touch' òskwà tsèsìskwàrì 'touch many things'

There is an initial cluster in the syncopated form, but crucially no initial cluster in the reduplicated form. Sagey's observations on the examples in (24) go as follows:

"...it is the syncopated form of 'to push', sùkùdə, that is reduplicated, because in the reduplicated form there is no vowel between the second /s/ and the /k/. Compare the derivation: tàpərə 'to vomit' → tàtàpərə 'to vomit many times'. If reduplication were applying to the form sùkùdə, we would thus expect *süsùkùdə on analogy with tàtàpərə. We cannot apply syncope after reduplication to derive sùskùdə from *süsùkùdə, because we would then expect tàtàpərə → *tàtàpərə. Note, furthermore, that the elided vowel in skùdə was a /u/. If this vowel were present in the form that reduplication applied to, the first vowel in the reduplicated form would also be /u/, yielding *sùskùdə, rather than the default /ə/, as in sèsùkùdə." (p.179)

This argument is critical, since these cases with syncope are the only ones which might show that Margi makes a distinction between consonant clusters on the one hand and labiocoronal and other complex consonants on the other. If syncope does not need to be ordered before reduplication, then the reduplication rule does not need to distinguish onsets of different kinds.

However, Sagey's arguments have several problems. First, she argues that if reduplication were applying to the base form sùkùdə the vowel in
the reduplicated form would be $u$. We have argued that $u$ is a variant of an underlying single high vowel element which we write $/a/$. Its [+round] variant appears when [+round] has been spread from a preceding or following labialized consonant. In $\text{sükûdê}$ the final consonant is obviously not rounded, but the medial velar is, or the vowel following it would not be $u$. Given a labialized velar the vowel in the first syllable is likely to be rounded by anticipatory spreading, as in the examples in (13) and (17) above. Hence the underlying form of $\text{sükûdê}$ is $/sèkûduðe$/ . The reduplicated form to be expected from this base is $/sèsèkûduðe$/ . If the syncope rule is applied to this form the correct output is derived. Simplified derivations for the two forms in (24) are given in (25).

(25) underlying form by spreading rule by syncope

<table>
<thead>
<tr>
<th>base form</th>
<th>by spreading rule</th>
<th>by syncope</th>
</tr>
</thead>
<tbody>
<tr>
<td>$sèkûduðe$</td>
<td>$sukûduðe$</td>
<td>$skûduða$</td>
</tr>
<tr>
<td>$tsekûða$</td>
<td>$tsûkûða$</td>
<td>$tskûða$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>reduplicated form</th>
<th>reduplicated form</th>
<th>reduplicated form</th>
</tr>
</thead>
<tbody>
<tr>
<td>$sèsèkûduðe$</td>
<td>$sèsukûduðe$</td>
<td>$sèskûduða$</td>
</tr>
<tr>
<td>$tsètsèkûðarî$</td>
<td>$tsètsûkûðarî$</td>
<td>$tsètskûðarî$</td>
</tr>
</tbody>
</table>

Note that our account not only predicts the correct vowel in these reduplicated forms but also removes a rather problematical feature of Sagey's rule ordering, which had placed syncope, a rule which derives surface phonetic alternants, before reduplication, a rule which derives morphological variants in the lexicon.

Sagey's other argument for stating that syncope cannot apply after reduplication is that incorrect syncopated forms would be derived as a result of this ordering. She cites $\text{tàtàpàrâ} + *\text{tàtàpàrâ}$ as a case of incorrect syncopation. This is an ill-chosen example, since the conditions for the syncope rule to apply are entirely unsatisfied; low vowels do not syncopate,

---

8Note that when a labialized consonant is reduplicated it determines the phonetic surface form of the vowel (especially if nonlow), e.g. the vowel in the reduplicated form of $bû'boil'$ [bu] must be [u]; $bûbû + $[bûbû] .
and the consonant environment is wrong. Syncope only applies when the follow­
lowing consonant is velar and the preceding consonant is coronal (or, rare­
ly, labial). All the examples Hoffman gives also involve only obstruent
consonants and this seems to be another condition on the rule. There are no
forms in Hoffman to suggest that a properly constrained syncope rule does
not apply to any case which satisfies its conditions.

Sagey's arguments from reduplication therefore fail to establish that
Margi is drawing a distinction between clusters (derived from syncope) and
single consonants. Hence they provide no evidence for the claim that the
labiocoronal elements such as pt, bʃ, mnY, etc. are being treated as
single consonants, despite their complex nature.

Before leaving the topic of reduplication, there are a couple of other
points worth noting. Both Hoffman and Sagey suggest that the partial redupli-
cation rule omits any syllable-final consonants and copies only onset and
vowel. Examination of Hoffman's materials shows that most of the "partially
reduplicated" forms with an omitted final consonant have fuller variants
with the same meaning in which the syllable-final consonant is present. Al-
most all involve failure to reduplicate a syllable-final /l/. Examples
of such duplicates are given in (26).

(26) base reduplicated form 1 reduplicated form 2

<table>
<thead>
<tr>
<th>base</th>
<th>reduplicated form 1</th>
<th>reduplicated form 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ɲɛɭ 'abuse'</td>
<td>ɲɛɭɲɛɭ 'abuse many times'</td>
<td>ɲɛɭɲɛɭ</td>
</tr>
<tr>
<td>ɲɛɭ 'bite'</td>
<td>ɲɛɭɲɛɭ 'bitten'</td>
<td>ɲɛɭɲɛɭ</td>
</tr>
<tr>
<td>ɣɛɭ 'be old'</td>
<td>ɣɛɭɣɛɭ 'old, aged'</td>
<td>ɣɛɭɣɛɭ</td>
</tr>
<tr>
<td>dɛm 'originally'</td>
<td>dɛmdɛm 'long ago'</td>
<td>dɛmdɛm</td>
</tr>
</tbody>
</table>

These data suggest that it should not be ruled out that the partial redupli-
cation rule generates a copy of the entire initial syllable, as originally
suggested by Maddieson [1983]. This would then be followed by application
of a rule which deletes the syllable-final consonants under circumstances
which are rather hard to specify from the material available at present.

The second matter concerns whether ø is a default vowel in redupli-
cation. Hoffman describes the partial reduplication process as follows:
"... only the initial (simple or compound) consonant is reduplicated, mostly
with the vowel ə" (§251). This remark implies that the vowel of the initial syllable is not copied, but instead is normally replaced with the vowel /ə/. We have already discussed the example of ṣəskudə, where Sagey proposes that a default vowel is supplied in the reduplicated form but where our account specifically predicts that [ə] will occur. Apart from cases of this type, there seems to be only one example where the vowel of the stem is not copied in the reduplicated form, and that is the word for 'pick up', given in (23) above. In general, the reduplicative process copies the vowel of the base form on which it operates. If /ə/ is a default vowel it is one in a much wider sense than concerns just reduplication, since any vowel that is not /ə/ can be predicted to be /ə/.

3.2. Consonant sequences and syllable structure. Sagey [1986:182-184] also suggests that there is evidence to show that labiocoronal elements are single segments from the way in which they take part in consonant sequences. One line of argument concerns prenasalized stops in medial clusters beginning with /r/. This can be summarized as follows. In a sequence /-VrNSV-/ (where N is a nasal and S is a stop) NS can be considered a single segment, if homorganic, or can be considered to be two segments. In the latter case, the syllable boundary (.) might be considered to fall before or after the nasal, giving either /-Vr.NSv-/ or /-Vr.N.Sv-/ . Sagey argues that the first placement is unacceptable since it violates sonority sequencing within the syllable, creating an onset with a nasal preceding a stop.9 And the second placement is ruled out by the facts of Margi: if the N is placed in the same syllable as /r/ then "there is no explanation for the fact that the syllable-final nasal is in every case homorganic with the following consonant" (that is, the S). Sagey points out that non-homorganic

9Sagey offers no other argument for dismissing this syllabification. However, language facts sometimes require that it be admitted. Russian "fleeting vowels" are sometimes deleted between an initial sonorant and an obstruent, e.g. ьYěștniь 'flattering' but ьYșțiYtY 'to flatter', and the genitive singular forms of mox 'moss', lоb 'forehead' and lYod 'ice', which are mxа, lba, and lYda respectively. Strict adherence to sonority rules would rule out deletion in such a position.
sequences of nasal+stop can be derived in Margi through suffixation and re­
duplication processes, so there is no general constraint that heterosyllabic
NS sequences must be homorganic. Therefore the requirement for homorganic­
ity in clusters with /r/ can only be explained if it is assumed that these
NS sequences in Margi are single prenasalized segments, with a syllabifica­
tion which might be represented /-Vr.NSV-/. Since the NS sequences in ques­
tion include labiocoronal elements such as /mnYa/ , /md/ , /mt/ , as in the examples
given in (27), this argument is taken as contributory proof of the unitary
nature of labiocoronal elements in general.

(27) •••ārmmnYa 'at the side of'
āwárašptārmndē 'owl (sp.)'
ārmmtā 'journey'

Sagey writes the labiocorona1s /md/ , /mt/ in (27) as /mnbd/ , /mnpt/
to indicate that she considers the nasal and the stop components to be pro­
duced with simultaneous labial and alveolar articulations. If this were so,
the nasal and stop elements would indeed be homorganic. However, all the
phonetic evidence suggests that this supposition is not correct. Detailed
phonetic evidence was given in Maddieson [1983] showing that the correspond­
ing sequences in Bura, a language closely related to Margi, are sequences of
labial followed by alveolar articulation. But Bura is not Margi, and it
might be that the languages differ in exactly this area. Unfortunately, the
available Margi recordings are not of a nature to allow for preparation of
publication-quality figures to match those presented for Bura.¹⁰ Nonetheless,
it is clear that Margi is like Bura. In /mnYa/ (in /mnYa/ 'mouth')

¹⁰The Margi tape contains a recording of an approximately hour-and-a-­
half long elicitation session conducted by Alfred Opubor and Peter Ladefoged
with two Margi speakers, Sulemanu Duhu Abber and Bitrus Lassa Indaju. Eli­
citation is primarily through Hausa, but English is also used as the only
language common to all four participants. The participants frequently talk
over one another during this session, and signal to noise ratio is rather
variable. The tape was analyzed by careful aural procedures, copying sec­
tions to a repeating digital playback loop and gating out words, syllables
and segments for isolated attention. In addition wide-band spectrograms
were made of all items of interest.
there is a clear change from initial /m/ to final /ŋγ/. Each portion has a duration of at least 100 ms. The nasal portions of the sequences /md/, /mt/ (as in /mdɔ/ 'surpass' or /mtɔgɔ/ 'bush')\(^{11}\) are clearly auditorily labial throughout their duration. If they were produced with a simultaneous alveolar articulation, the effective resonance chamber in front of the nasal air escape would be the same as that for an alveolar. The auditory effect would therefore be like an alveolar. The stop portions show only alveolar characteristics. Since these sequences are not homorganic, an argument based on this supposition naturally fails.

There is another problem with the argument based on the data cited in (27). These forms, and all others like them, are complex compounds, containing either the genitive suffix /-r/ (§90), or the preposition /år/ (§401). For example, the word for 'owl (sp.)' is a nominalized sentence which includes the phrase 'skin of person'; 'skin' is /ptʃa/, 'person' is /mdɔ/ and the two are linked by the genitive /-r/. A boundary, normally a word-boundary, follows this suffix or the preposition. Naturally, a sequence of /r/ and any segment or sequence that can begin a word can thus be formed. There is no special constraint on what can follow /r/ over and above the constraints that apply at the beginning of words.

The question thus becomes whether there is any evidence that word-initial labiocoronals are single segments or sequences. We will present only one brief argument. Consider the verb /bdɔ/ 'chew'. This begins with a labiocoronal element which in Ladefoged's and Sagey's view is a doubly-articulated labial-alveolar implosive [bd]. If a single segment this would be expected to have a similar duration to other implosives. We may observe its duration reliably by measuring the medial occurrence in the reduplicated participial form /bdɔbdɔ/ 'chewed'. The duration of the intervocalic consonant(s) was measured in four tokens of this word (two by each speaker) and compared with the medial /d/ in each speaker's reading of the word /dɔdɔhɔ/ 'bitter', also a reduplicated form. The duration of /bdɔ/ is

\(^{11}\)In initial position /m/ is normally voiceless before /t/ or /p/, and /n/ is voiceless before /t/. The same rule applies in Bura.
over twice the duration of \( \hat{c} \); the former ranging from 175 to 200 ms, the latter measured at 65 and 75 ms duration. The extended duration of /bd/ requires an explanation, and a natural one is that this is a sequence of two consonants, rather than a single one.

4. **Conclusion**

Sagey [1986] argued that there were complex labiocoronal segments in Margi and that therefore the feature hierarchy [Clements 1985] must allow for these, that is, it must allow for segments which have both labial and coronal nodes below the place node. For Sagey, the question became important primarily because of the questions raised in ensuring that the distinction between a doubly-articulated labiocoronal segment and a labialized coronal segment, i.e. one with a secondary articulation, was represented. In other words it came down to ensuring that the correct degree of stricture was assigned to the labial articulation in these two cases. If the feature hierarchy is redesigned to include a secondary articulation node, as suggested by Archangeli & Pulleyblank [1986], this particular problem becomes moot. However, we may also note that it should not have arisen in connection with Margi. An understanding of the Margi vowel system and the role of secondary articulations in the phonology and morphology of the language removes the basis of one of the arguments in favor of interpreting the labiocoronalas single segments. Observations of the phonological and phonetic patterns of syllabification remove the other.
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A TYPOLOGICAL ANOMALY IN SOME SURMA LANGUAGES*

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This paper presents evidence that at least three languages in the Surma group (and possibly also Proto-Surma) are exceptions to the proposed typological "universal" that languages with basic VSO word order do not have postpositions [Greenberg 1963:78]. There is no attempt made here to hypothesize how this came about, only to call attention to the fact that these three languages are typologically anomalous.

The Surma languages are found on both sides of the Ethiopia-Sudan border, in the southern parts of both countries. Surma is classed as part of the Eastern Sudanic Phylum, within the Nilo-Saharan family [Bender 1983:2]. Fleming [1983:533] has sub-divided the Surma languages, with the following abbreviated chart showing the higher levels of division and the relationships among the languages under discussion.

```
PROTO-SURMA
  /    \
 /      \
SOUTHERN
  \    /   \
 /  SOUTHWEST  SOUTHEAST   NORTHERN
   \    /       \       / \\
    Murle       Majang
     |        \   /    \\
     Didinga  Majang
```

Data on Murle is from Lyth [1971] and Arensen [1982]. Arensen [1982:52] states that the basic order of elements in a sentence is VSO, illustrated in (1) and (2).

(1) kloina naana kiziwan balawaaz 'yesterday I saw a buffalo' (p. 115)
    I-saw I    buffalo yesterday

*My Majang field work has been conducted under the Institute of Ethiopian Studies, Addis Ababa University, from 1984-1986. Janet Leitch and Glenn Davis did initial typological studies of Majang and Murle, respectively, at the Summer Institute of Linguistics at the University of North Dakota, 1986, and shared the results with me.
Murle uses VSO order in negative sentences [Arensen 1982:116], but I have argued elsewhere that SVO negative sentences in Southwest Surma derive from VSO [Unseth 1986].

Murle marks locations with postpositions, as is shown in (3-5). As Lyth (a layman) observed, some "prepositions follow their objects" [Lyth 1971:43]. The postpositions are all suffixed with -a, the locative case marker.

For Didinga, Driberg [1931:153] noted, "The order is always verb - subject - object." Additional Didinga data is provided by Odden [1983].

The presence of postpositions in Didinga is illustrated in (8a), (8b), and (9).
Surma Typology

(11) dɜamko bɔɪokaye ta r a cakoye 'Bokaye ate meat and tuber'
he-ate Bokaye meat and tuber

Majang also uses postpositions, as seen in (12) and (13).

(12) mɛlkaako atolay biş 'I came with Tolay'
I-came Tolay with

(13) kooko gidse raŋ 'a snake is on the rock'
snake rock on

The following chart summarizes the usual patterns for some typologically relevant elements of the three languages. One note of clarification: like many Southern Surma languages, Didinga and Murle have a full system of subject suffixes but also a sporadic pattern of a kV- prefix in some paradigms.

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<th>Didinga</th>
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<td>suffixes</td>
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<td>follow</td>
<td>follow</td>
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<tr>
<td>Possessive pronouns</td>
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<tr>
<td>Case marking</td>
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</tbody>
</table>

This paper has shown that at least three Surma languages, Didinga, Murle, and Majang, have VSO order and use postpositions. Didinga has both postpositions and prepositions, but "only [one] preposition worth mentioning" [Dregger 1931:151].

Since languages on both sides of the original binary split within Surma, i.e. Northern and Southern, have VSO order, it is reasonable to assume that Proto-Surma was VSO. Furthermore, since postpositions have been found in all documented Surma languages, it is safe to assume that Proto-Surma also had postpositions. This logically leads to the hypothesis that Proto-Surma itself was typologically anomalous, being VSO with postpositions.
REFERENCES


After this article had been typeset, I discovered Hawkins' [1983] discussion of word order universals. Like Greenberg, Hawkins has not found any example of a language that has the following traits: VSO order, postpositions, adjectives that follow nouns, and genitives that follow their head nouns, what Greenberg [1963:109] called Type 5. However, unlike Greenberg, though Hawkins has not found any examples of Type 5, he specifically allows the possibility that Type 5 languages may exist [1983:68]. Within Hawkins' framework, then, these Surma languages are not exceptions, but merely the first documented cases of a predictably rare type.

REFERENCE

Because of mail problems, Volume 18, Number 2, August 1987 had to go to press before Norbert Nikiema was able to read and return proof pages for "Différences de comportement et rapport entre consonne finale de radical CVC et consonne initiale de suffixe en moore." Despite careful reading by two proofreaders, a number of errata, some of which were in the original manuscript, appear in the published version. Below is a list of the most crucial errors. We regret any misunderstandings that these errors may have created.

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CHADIC: 16:161 (Lindau-Webb); 18:327, 341-344 (Maddieson); Supp. 9:114-118 (Frajzyngier); Supp. 9:186-190 (Lahaie); Supp. 9:191-195 (Leben); Supp. 9:233, 235 (Newman)
CHIBEMBA: 18:17, 18 (Corbett and Mtenje); 18:305, 306 (Rugero and Mukala); Supp. 9:283 (Schadeberg)
CHICHEWA: 18:1-38 (Corbett and Mtenje)
CHI-MWI:NI: 18:318, 321 (De Guzman)
CHINESE: 16:173, 176 (Lindau-Webb); Supp. 9:309, 312, 313 (Wahba)
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CIGOGO: 17:313 (Botne)
CINYANJA: 17:308 (Botne)
CIRURI [see RURI]
CIYAO: 17:305, 306, 312-314 (Botne)
COMORIAN: 16:251, 257, 258, 267 (Nurse); Supp. 9:246, 249 (Nurse)
COPTIC: Supp. 9:186 (Lahaie)
CREOLE: [HAITIAN] 16:327 (Nylander); [HAITIAN and CAPE VERDEAN] Supp. 9:146-150 (Hutchison); [HAWAIIAN] Supp. 9:291 (Scotton)
CREOLE ENGLISH [see PIDGIN ENGLISH]
CROSS RIVER: 17:39-54 (Farac1as); Supp. 9:78-81 (Demuth and Farac1as)
CUSHITIC: 16:243-279 (Nurse); Supp. 9:186, 187, 189 (Lahaie)
DAHALO: 16:243-279 (Nurse)
DELTA-CROSS [see CROSS RIVER]
DGHWEDE: Supp. 9:188 (Lahaie)
DIDINGA: 18:357-361 (Unseth)
DIGIL: [see SOMALI]
DIGO: Supp. 9:126 (Goldsmith)
DINKA: Supp. 9:328 (Yokwe)
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DZAMBA: 18:17 (Corbett and Mtenje)

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EDOID: 16:111, 113, 117 (Capo)

EFIK: 17:39-54 (Faraclas)

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ELEME: 17:41, 46, 47, 50, 52 (Faraclas)

ELWANA: 16:243-279 (Nurse); Supp. 9:246, 249 (Nurse)

EMAI: 17:177-198 (Schaefer)

ENGENNI: Supp. 9:256 (Odden)

ENGLISH: 16:60 (Schaefer); 16:91, 92, 94, 95, 98, 99 (Steinbergs); 16:153 (Attouman); 16:173, 176 (Lindau-Webb); 16:331 (Nylander); 17:99 (Lawal); 17:180 (Schaefer); 17:199 (Charles-Luce); 18:77 (Lawal); 18:278-280 (Barrett-Keach); Supp. 9:1-5 (Akinnaso); Supp. 9:33-38 (Bowcock); Supp. 9:65, 66 (Creider); Supp. 9:100-104 (El-Noory); Supp. 9:184 (Kimenyi); Supp. 9:191 (Leben); Supp. 9:224-227 (Messiha); Supp. 9:245-247, 249 (Nurse); Supp. 9:264 (Roberts); Supp. 9:293-297 (Steinbergs); Supp. 9:311, 313 (Wahba)

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EPIE: 16:114 (Capo)

EWE: 16:260 (Nurse); Supp. 9:196-202 (Lewis)

EWONDO: 16:32 (Hedinger)

FANG: 18:171 (Nikiema)

FRENCH: 16:331 (Nylander); Supp. 9:183 (Kimenyi)

FULA: 17:74 (Schadeberg); 18:171 (Nikiema); Supp. 9:33, 36, 37 (Bowcock)

FUR: Supp. 9:157-162 (Jake)

GANDA [see LUGANDA]

GANZA: Supp. 9:20 (Bender)

GARREE: Supp. 9:6-9 (Ali and Arvanites) [see also SOMALI]

GERMAN: 16:90, 91, 94, 95, 98, 99 (Steinbergs); Supp. 9:293-297 (Steinbergs)

GIKUYU: Supp. 9:220, 221, 223 (Maundu) [see also KIKUYU]

GISEDA: 16:113 (Capo)

GODIE: Supp. 9:79 (Demuth and Faraclas)

GOKANA: 17:41, 47, 50, 52, 53 (Faraclas); Supp. 9:262-268 (Roberts); Supp. 9:304-308 (Wagner)
GREBO: 16:114 (Capo)
GUDE: 18:341, 342 (Maddieson)
GUMUZ: Supp. 9:19-21 (Bender)
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GWENO: 16:244 (Nurse)
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HAUSA: 16:135-160 (Attouman); 16:161-182 (Lindau-Webb); 17:249-267 (Newman); 18:72, 73 (Lawa1); 18:171 (Nikiema); 18:239-248 (Attouman); Supp. 9: 72-77 (Davis); Supp. 9:186-188 (Lahaie); Supp. 9:191-193, 195 (Le­ben); Supp. 9:233-237 (Newman); Supp. 9:318-322 (Yanco)
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HOZO-SEZO: Supp. 9:20, 21 (Bender)
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IGBIRRA: 16:111, 117 (Capo)
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IJO: 16:317, 318 (Madugu); 17:53 (Faraclas)
IKA: 16:114 (Capo)
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IŞEKIRI: 16:103-121 (Capo)
ISOKO: Supp. 9:83-89 (Donwa-Ifode)
ITALIAN: 16:331 (Nylander)
JANJERO: Supp. 9:21 (Bender)
JAPANESE: Supp. 9:309, 313 (Wahba)
JARAWAN: 17:74 (Schadeberg)
JIIDDU: Supp. 9:6-10 (Ali and Arvanites)
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[see also GIKUYU]
KILUBA: 18:299 (Rugero and Mukala)
KIMATUUMBI: Supp. 9:256 (Odden)
KIMERU: 18:312 (De Guzman)
KINGA: Supp. 9:283 (Schadeberg)
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KIPARE: Supp. 9:255 (Odden); Supp. 9:285-289 (Schlindwein)
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KIRUNDI: 17:307, 309, 311 (Botne); Supp. 9:126, 127 (Goldsmith)
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KISTANINYA: Supp. 9:130-133 (Hailu)
KISWAHILI [see SWAHILI]
KITUBA: Supp. 9:98 (Demuth and Farac1as)
KIYAKA: 18:175-209 (Kidima)
KIZÉELÁ: 18:299-305 (Rugero and Mukala)
KOHUMONO: 17:39-54 (Farac1as)
KOLOKUMA: 16:114 (Capo)
KOMAN: Supp. 9:19-21 (Bender)
KONGO: Supp. 9:283 (Schadeberg)
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KOTOKOLI [see TEM]

KRIO: 16:323-336 (Nylander); Supp. 9:251-253 (Nylander)

KRU: Supp. 9:78-81 (Demuth and Farclas)

KUGBO: 17:41, 43, 44, 50, 52 (Farclas)

KUSAAL: Supp. 9:105-110 (England and Ladusaw)

KWA: 16:104, 109, 112 (Capo); 16:223-234 (Schneider); 17:73 (Schadeberg)

KWAMA: Supp. 9:21 (Bender)

LAMBA: 17:307 (Botne)

LATIN: Supp. 9:316 (Wald)

LATVIAN: 16:90 (Steinbergs)

LELEMI: 16:113 (Capo)

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LOKO: Supp. 9:54, 55 (Churma)

LOMONGO: Supp. 9:54 (Churma)

LOWER CROSS [see CROSS RIVER]

LÜBA SHABA: 18:305, 306 (Rugero and Mukala)

LUGANDA: 17:310 (Botne); 18:17 (Corbett and Mtenje); Supp. 9:124 (Goldsmith); Supp. 9:283 (Schadeberg); Supp. 9:328 (Yokwe)

LUGBARA: 17:55-68, 319 (Andersen); 18:47, 48 (Andersen)

LULUBO: 17:56-58, 63-65, 319 (Andersen); 18:39-65 (Andersen)

LUVALE: 18:18 (Corbett and Mtenje)

LUYIA: 17:155-176 (Dalgish)

MAASAI [see MASAI]

MAAY: Supp. 9:7, 8 (Ali and Arvanites)

MADI: 17:55-68, 319 (Andersen); 18:47, 48 (Andersen)

MAJANG: 18:357-361 (Unseth)

MAKUA: 16:244 (Nurse); Supp. 9:256 (Odden)

MALANKOTE [see ELWANA]
MAMBILA: 17:74 (Schadeberg)
MANDARA: Supp. 9:189 (Lahaie)
MANDINKA: Supp. 9:33-38 (Bowcock)
MARGI: 18:327-355 (Maddieson); Supp. 9:186, 187 (Lahaie)
MAO: Supp. 9:19-21 (Bender)
MAPUN: Supp. 9:114-117 (Frajzyngier)
MASAI: 17:129, 133 (Pulleyblank); Supp. 9:69 (Dalgish)
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MBOÓ-BANEKA: 16:12 (Hedinger)
MBUTI: Supp. 9:63 (Creider)
MENDE: Supp. 9:57-62 (Cowper and Rice); Supp. 9:90-94 (Dwyer)
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NANDI: Supp. 9:64-68 (Creider)
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NEMBE: 16:114 (Capo)
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NGIZIM: 18:342 (Maddieson)
NGUNI: Supp. 9:211 (Marivate)
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NIGER-CONGO: 17:69-77 (Schadeberg); Supp. 9:78-82 (Demuth and Farclas)
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NUKALONG: 17:76 (Schadeberg)
NUMAND: 17:76 (Schadeberg)
NUPE: 16:295-321 (Madugu)
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NYANGBO: 16:113 (Capo)
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SOMALI: 16:243-279 (Nurse); Supp. 9:6-10 (Ali and Arvanites); Supp. 9:187 (Lahaie)

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SURMA: 18:357-361 (Unseth)
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18:17 (Corbett and Mtenje); 18:81-95 (Wilt); 18:97-105 (Leonard);
18:175, 180 (Kidima); 18:263-298 (Barrett-Keach); Supp. 9:11 (Awo-
buluyi); Supp. 9:22-26 (Bertoncini); Supp. 9:95-99 (Eastman and
Omar); Supp. 9:163-167 (Keach); Supp. 9:245-250 (Nurse); Supp. 9:290-292 (Scotton); Supp. 9:298-303 (Tyler); Supp. 9:315-317 (Wald);
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SWAZI [see NGUNI]

TAABWA: 18:305, 306 (Rugero and Mukala)

TANGALE: Supp. 9:173-180 (Kidda); Supp. 9:313 (Wahba)

TEM: 17:1-37 (De Craene)

TERA: Supp. 9:186, 188 (Lahaie); Supp. 9:191, 193 (Leben)

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TNY: Supp. 9:130, 131 (Hailu)

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TOK PISIN: Supp. 9:149 (Hutchison)

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TSONGA: Supp. 9:210-213 (Marivate)

TSWANA: 16:57-87 (Schaefer); 18:17 (Corbett and Mtenje)

TUNNI: Supp. 9:6-9 (Ali and Arvanites)

TURKISH: 17:129 (Pulleyblank); Supp. 9:309, 313 (Wahba)

TWAMPA: Supp. 9:21 (Bender)

TWI: 17:102 (Lawal)

UGARITIC: Supp. 9:188 (Lahaie)

UKELE: 17:41, 42, 44, 50, 52 (Faraclas)

UMBUNDU: Supp. 9:282-284 (Schadeberg)

UPPER CROSS [see CROSS RIVER]

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Supp. 9:211 (Marivate)

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WANDALA [see DGHWEDÉ]

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XHOSA: 18:17, 23, 25 (Corbett and Mtenje); Supp. 9:11 (Awobuluyi)
[see also NGUNI]

YAWELMANI: Supp. 9:50 (Charette)

YORUBA: 16:103-121 (Capo); 16:223-234 (Schneider); 16:295-321 (Madugu);
16:327 (Nylander); 17:85-94 (Badejo); 17:95-105 (Lawal); 17:119,
120, 129 (Pulleyblank); 17:271 (Agheyisi); 18:67-79 (Lawal); Supp.
9:1-5 (Akinnaso); Supp. 9:11-14 (Awobuluyi); Supp. 9:39-44 (Car­
stens); Supp. 9:196 (Lewis); Supp. 9:329-334 (Yusuf)

YORUBA (PROTO-): 16:104, 108, 109 (Capo)

YORUBOID: 16:103-121 (Capo)

ZARMA: Supp. 9:318-322 (Yanco)

ZARMA-SONGhai [see ZARMA]

ZULGO: 18:342 (Maddieson)

ZULI: 18:17 (Corbett and Mtenje)
[see also NGUNI]
Attention African Language Teachers

New Organization

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The purpose of ALTA is to promote study, and teaching of African languages in the areas of basic research, language pedagogy, and literature, and to foster and encourage cooperation between individuals and between institutions engaged in these activities.

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Plans are being made for the 4th Nilo-Saharan Linguistics Colloquium which will be held in Bayreuth for approximately three days during the last week of August, 1989. Since plans have to be made a year in advance, the organizers would be grateful to have tentative information about attendance, papers to be offered, etc. by mid July 1988 at the latest. Please write to:

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