STUDIES IN AFRICAN LINGUISTICS

Published by the Department of Linguistics
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The University of California, Los Angeles

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Overseas air mail: $15.00 per volume
Single issues: $ 4.00
Supplements: $ 8.00 (if ordered separately or as part of earlier volume)

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Studies in African Linguistics is published three times a year. Supplements are independently financed and are sent free of charge with current subscriptions. Authors receive 25 free offprints of published articles. Papers submitted to the journal should be sent in triplicate.

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The Editors, Studies in African Linguistics
Department of Linguistics
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Volume 9, Number 3, December 1978

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# TABLE OF CONTENTS

## Articles

Russell G. Schuh, *BADE/NGIZIM VOWELS AND SYLLABLE STRUCTURE* .......................... 247

Gerard M. Dalgish, *INACCESSIBILITY AND DEMOTIONAL NOMINAL MARKING IN IRAQW* .......................... 285

## Papers from the 8th Conference on African Linguistics

### Working Group on Tone

Alexandre Kimenyi, *GRAMMATICAL TONE NEUTRALIZATION IN KINYARWANDA* .......................... 303

Daan Lombard, *A DIACHRONIC-TONOLOGICAL ANALYSIS OF CERTAIN RANK SHIFTED VERBAL STRUCTURES IN NORTHERN SOTHO* .......................... 319

Kevin C. Ford and G. N. Clements, *DOWNSTEP DISPLACEMENT IN KIKUYU (abstract)* .......................... 329

David J. Dwyer, *IDIOSYNCRATIC, SUPRASEGMENTAL PROCESSES IN MENDE* .......................... 333

INDEX TO VOLUMES VII – IX AND SUPPLEMENTS VI AND VII .......................... 345

PUBLICATIONS RECEIVED .......................... 377
Among the vowels of Bade and Ngizim, the short high vowels play a functional role different from the other vowels. Although word final i and u are full-fledged phonemes (non-predictable and contrastive), both the position of occurrence and the quality of the phonetic high vowels [i, ə, u] is predictable in medial position: the quality is determined by other segments in the environment; the position is determined by restrictions against certain groupings of consonants. Bade and Ngizim differ in one important respect in the placement of non-final short, high vowels, viz. through a change called PROTHESIS, original initial sequences of the type *C₁əC₂ ... (still realized as such in Ngizim) are now realized as əC₁C₂ ... in Bade if C₁C₂ is not an impermissible sequence. This is true for all words with no more than two consonants, though the situation is somewhat more complicated in longer words; tone of the initial syllable is also seen to play a role. The permissible sequences of consonants, and as a consequence the environment for PROTHESIS, are discussed in the light of universal hierarchies of consonantal strength and principles of syllabification in conjunction with a restriction in Bade/Ngizim against two consonants occurring at a syllable margin.

1. Introduction
1.1. The languages. Bade and Ngizim are two closely related languages of the West Chadic branch of the Chadic family spoken in northeastern Nigeria.¹

¹The most recent classification of Chadic languages [Newman 1977] divides the Chadic family into four major branches: West Chadic, spoken almost entirely in northeastern Nigeria; Biu-Mandara, spoken in northern Cameroon and adjacent areas of Nigeria and Chad; East Chadic, spoken in Western and central Chad; and Masa, spoken in Cameroon and Chad south of N'Djamena.
Ngizim is spoken in an area fanning out to the east from Potiskum. Bade is spoken north of Ngizim in an area from Gashua to the west and south. Bade and Ngizim are no longer in contact, but the migration of the Ngizims southward and the ultimate separation of the two language communities has taken place only in the last few hundred years.

Ngizim has virtually no dialect differentiation other than a few lexical differences among villages. Bade, on the other hand, has considerable differentiation at all linguistic levels (see Schuh [1977a] for many examples in the determiner system and associative noun phrases). The dialect used here is that of Gashua and adjacent villages. Although there are a number of phonological differences between this dialect and others, all dialects are virtually identical in the respects relevant to this study.

1.2. Scope of the present study. One of the main areas of interest in Bade and Ngizim phonology is the distribution of high vowels. In fact, high vowels in both languages function primarily as epenthetic vowels to break up impermissible consonant sequences. The paper begins with a summary of the vowel phonology of this group, concentrating on the distribution of high vowels.

Following this is a description of a phonological difference between Bade and Ngizim, which is discussed and illustrated in detail. Briefly stated, this difference is the following: under certain conditions, in an initial sequence $C[V^{+\text{high}}]C$ Bade has dropped the vowel and added a prothetic high vowel to give a sequence $[V^{+\text{high}}]CC$, whereas Ngizim has not done this, e.g. Ngizim gùzép 'slave' but Bade ugużéf 'slave'.

Finally, certain universal principles of syllabification which have been proposed are cited as bearing on the distribution patterns of Bade and Ngizim high vowels.

2. Bade/Ngizim Vowels

2.1. Vowel nuclei. The simple vowel nuclei of Bade and Ngizim are given in (1):
Doubled vowels represent long vowels; the symbol $\partial$ represents phonetic $[\partial]$ and hence is one of the set of high vowels.

The mid vowels are of secondary origin, having entered the languages through borrowing and monophthongization of diphthongs. Long $aa$ and short $a$ contrast in all environments, though long $aa$ is extremely rare in word final position. Some minimal or near minimal pairs are given in (2):$^2$

$^{(2)}$

<table>
<thead>
<tr>
<th></th>
<th>Ngizim</th>
<th>Bade</th>
<th>Ngizim</th>
<th>Bade</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\partial$asú</td>
<td>$\partial$asú 'pour'</td>
<td>$\partial$asú</td>
<td>$\partial$asú 'finish'</td>
<td></td>
</tr>
<tr>
<td>gàadú</td>
<td>kàadú 'bite'</td>
<td>gàdú</td>
<td>kàdú 'break'</td>
<td></td>
</tr>
<tr>
<td>àaadâu</td>
<td>àaadâu 'south'</td>
<td>àdân</td>
<td>àdân 'crying'</td>
<td></td>
</tr>
</tbody>
</table>

No high vowels can be reconstructed word initial for proto-Bade/Ngizim,$^3$ though in Bade the sound change mentioned above and discussed in detail below has produced initial $[uu]$ ($<^{*wu}$), $[ii]$ ($<^{*yi}$), $[u\partial]$ ($<^{*Cu}$), and $[\partial\partial]$ ($<^{*C\partial}$).

$^2$Tone marks are acute accent ($'$) for high tone, grave accent ($\backslash$) for low, circumflex accent ($^\wedge$) for falling, and tick ($'$) for downstep. The following transcription conventions should also be noted: $c$ and $j$ are voiceless and voiced palatal affricates respectively; $sh$ and $zh$ are voiceless and voiced palatal fricatives respectively; $ny$ is a palatal nasal, analyzed as a unit phoneme, not a sequence; $\gamma$ is a glottalized palatal semivowel; $\partial$ and $j$ are voiceless and voiced lateral fricatives respectively; $kw$ and $gw$ are labialized velar stops, not stop-semivowel sequences.

$^3$This statement is true for nouns. There may be one or two survivals of initial $^{*i}$ in verbs (see Table, fn. 15). If we move one historical step back, we must reconstruct initial $^{*i}$ in both nouns and verbs. Duwai, the most closely related language to Bade and Ngizim, has initial $i$, which is phonetically $[ii]$ but does not contrast with $[i]$ in this position, e.g. $\partial$idà 'eye' (cf. Bade and Ngizim då), $\partial$ijé 'dog' (cf. Bade and Ngizim jà).
Medially the long high vowels, ii and uu contrast with each other and with other vowels. There are no minimal ii/uu pairs, but there is no way to predict which vowel will be used on the basis of phonological environment. As we will see below, the short high vowels i/u/ə are not in contrast medially—the quality of a medial short high vowel is phonologically predictable. Some minimal or near minimal sets showing medial contrast between ii and uu and between these vowels and the medial short high vowel(s) are given in (3):

(3) long high vowels  short high vowels
z'idú  s'idú  'slaughter'  zèdù  èdzù  'six'
víidà  fíidà  'hare'  vèdà  èvdà  'open space'
dúuzhì  dúuzì  'owl'  dèzhì  dèzì  'vein'
rùunú  lùunú  'spread to dry'  rènù  rènù (< *rènù)  'fornicate'

Long high vowels do not occur underlyingly in word final position. There is, however, a monophthongization rule shared by Bade and Ngizim which changes the word final diphthong -ai to [ii] and -au to [uu] when the word occurs in the middle of a phrase, e.g.

(4) (Ng)  rákài  'bed'  rákí  bái  'it's not a bed'
(Ba)  lákài  'it's not a bed'
(Ng and Ba)  sèsäu  sèsúu  bái  'it's not a hut'

The short high vowels i and u are in contrast with each other and with a and aa (also with the mid vowels ee and oo) in word final position. There are no lexical minimals pairs distinguished only by final i or u, but choice of i, u, or the absence of a vowel cannot be predicted phonologically. The vowel [ə] does not occur underlyingly word final, but word final /i/ and /u/ change to [ə] medially in a phrase under the appropriate conditions (see below).

---

Minimal sets can be constructed in the verbal system where different verb forms are marked by final vowel changes, among other things, e.g. Ngizim já kərʊ 'we stole', já kərì 'that we steal', já kərā 'we should steal'.
2.2. Quality of medial short high vowels. The quality of medial short high vowels is determined by phonological environment. The rule for determining the choice of [i], [u], or [æ] is given in (6).\(^5\)

$$\begin{align*}
\begin{array}{c|c|c|c|}
V & +\text{high} & \text{in the env. of } y \\
+\text{long} & \text{in the env. of } w \text{ or labialized velar} \\
\end{array}
\end{align*}$$

Conditions: (1) Vowel does not precede pause.

(2) When the env. for both [i] and [u] are met, the env. following the vowel overrides the env. preceding the vowel.

---

\(^5\)Phonetically a wider range of vowels than these exists. Thus, following palatals the vowel tends to be somewhat fronted, e.g. Ng jàjëm ['jìjìm] 'thorn', and following labial fricatives the vowel tends to be somewhat rounded, e.g. Ng vâru ['vãrù] 'go out'. Also, the following environment generally exercises a stronger influence than preceding. Thus, the vowel following \(w\) is not as strongly rounded as when preceding \(w\), and in my field notes I have often transcribed a \(æ\) instead of a \(u\) following \(w\) but never preceding \(w\), e.g. Ng wàdù or wùdù 'cut', but only Ng fùwù 'get down', never *fëwù.
The conditioning environments for [i] and [u] may either precede or follow the vowel. In the transcription used here it is the vowel u which marks a velar as labialized (there are no labialized consonants at other points of articulation). Thus, in Ngizim the word for 'stomach' is underlyingly /kʰɛnû/ and 'heavy' is underlyingly /dákʰwʃi/, where ø is used as a cover symbol for "short high vowel". Some examples of each of the medial short high vowels are given in (7).

Many more examples can be seen above and below.

(7) [i] [u]  
   gáyìm gáyìm 'cat'  wùrwùrû wùdɛwùdû 'sprinkle on'  
   fìfìyù fìfìyù 'whistle'  fùwàk fùwàk 'horn'  
   [e]  gùmcí gùmcí 'chin'  
   bábèt pèbèt 'ashes'  dùkshí dùksí 'heavy'  
   dèdèm tèdèm 'blood'  
   kèrù kèlù 'steal'

As condition (2) states, if the environments for both [i] and [u] are present, the following environment takes precedence.

(8) wìyàk  wìyàk  'vulva'  
    dàakwìyà ákwìyà  'deaf person'  
    yùwàn (no exs.)6  'sleeping'

Rule (6) is not only a statement of phonetic constraints on high vowels within words but is also a productive phonological rule applying to any word final high vowel when it occurs in the middle of a phrase.

(9) (Ng and Ba) /ácli báj/  --->  [ácli báj]  'it's not him'  
    /áti báj/  --->  [áti báj]  'it's not her'  
    /áti yàayè/  --->  [áti yàayè]  'even her'  
    (Ng) /gùmcí-w/  --->  [gùmcí]  'the chin'  
    (Ba) /gùmcí-wú/  --->  [gùmcíwú]

6For reasons given below, in Bade there could never be a high vowel before y with a w or velar following.
2.3. Position of medial short high vowels. Except for word final i and u, short high vowels appear only where they are needed to break up impermissible consonant sequences. A major consonant sequence restriction can be summarized by the observation that "the maximum syllable is CVC". This restriction rules out the sequences CCC, #CC, and CC#. Numerous examples have already been seen where a high vowel appears in #C___C to break up a word initial cluster and in C___C# to break up a word final cluster. It is difficult to find examples within a word where a high vowel which breaks up a CCC sequence cannot be explained by some other sequential restriction as well. However, as with rule (6), this restriction is a productive phonological rule as well as a restriction on word formation. An example of an underlying CCC sequence broken up by a high vowel is seen in Noun + Noun associative constructions. These constructions have the form N₁-k N₂. If the first noun (N₁) ends in a consonant and the second (N₂) begins in a consonant, a three consonant sequence would result. This sequence is broken up by inserting e after the associative morpheme /k/ (see 10a). Note that no e is inserted if N₁ ends in a vowel or N₂ begins in a vowel (see 10b).

(10) a. (Ng) /yəd-k tla/ --> [yəd-gə tla] 'hair of a cow'
(Ba) /'yat-k tla/ --> ['yat-kə tla] 

b. (Ng) [təká-k tla]
(Ba) [təkə-k tla] 'body of a cow'
(Ng) [am-g ákə]
(Ba) [ám-k ákə] 'hot water' (lit: 'water of fire')

Use of high vowels to break up word initial and word final sequences is also a productive rule which comes into play when morphemes are combined. Example (11a) illustrates use of a high vowel to break up an impermissible CC# sequence, but the non-appearance of this vowel where the consonant sequence is not word final. Example (11b) illustrates the same thing for a word initial sequence. In this position examples are found only in Ngizim since Bade would have #eCC rather than #CəC (see below).
(11) a. (Ng) rá nj 'fornication' but ná-ru 'I fornicated'
   (Ba) àrón ná-ru 'I fornicated'
   where the consonants of the root are r-n
b. (Ng) tèfú 'he entered' but ná-tfú 'I entered'
   vàgú 'he fell' but ná-vgú 'I fell'
   where the consonants of the roots are t-f and v-g respectively

Besides these restrictions on the number of consonants which may appear in a sequence, there are also restrictions on which consonants may appear in a sequence. The most important restriction, shared by both languages, is the impermissibility of the sequence obstruent + sonorant consonant. Obstruents include all oral stops, fricatives, and affricates; sonorants include all nasals, liquids, and semivowels. Some examples of words containing obstruent + sonorant sequences separated by short high vowels are given in (12).

(12) Ngizim Bade
   ázhamák ázamák 'Acacia seyal' but no *azmak, etc.
   zàpènú sàbènú 'churn' *zapnu, etc.
   kàkòrà kàkòrà 'load' *kakra, etc.
   kàtèrù ućèrù 'hop' *katru, etc.
   sàsúwà tòsúwà 'stalk' *séswe, etc.
   vàvìyú bàvìyú 'singe' *vavyu, etc.

A more detailed discussion of sequence restrictions shared by both languages is given in section 3.2.

There are a few differences between the languages in restrictions. Bade, but not Ngizim, has relaxed the restriction against obstruent + sonorant if the obstruent is /g/. Note in (13), however, that when /g/ has been allowed to abut with a following sonorant it has also undergone phonetic changes. We will return to this point in sections 3.2 and 4.

(13) Ngizim Bade
   zàgèmù sàgmú [sègmú] 'plant'
   mágèróf mègrà [mèγrà] (Ng) 'visitor'
   (Ba) 'grey-headed sparrow'
   mágìyá màgyá [màγýá] 'ratel'
Bade, but not Ngizim, freely allows syllables of the shape CVVC (a long vowel in a closed syllable). In Ngizim, the second C belongs to a separate syllable with a short high vowel nucleus. I have found no cognates where Bade has $C_1VVC_2C_3$ ... and Ngizim has $C_1VVC_2\alpha C_3$ ..., but the examples in (14) will illustrate the situation in the two languages.

(14) (Ba) tàagđû 'step on' cf. Ng t̪àkđû
   bángài 'babbon' cf. Ng bángài
   (Ng) gáagžhin 'remainder' but no *gaagzhin, etc.
   màadábëŗ 'corpulence' *maadber, etc.

A restriction found in Bade but not in Ngizim prohibits the sequence obstruent + glottalized consonant.

(15) (Ng) râpđû 'boil'
    (Ba) lâpđû

I should stress here that the epenthetic function of vowels discussed...
in this section applies only to short high vowels. Other vowels can occur freely in any position, as illustrated in (16).

(16) (Ng and Ba) pätà 'the bush' vs. áptà 'flour'
(Ng) mábú 'large calabash' vs. ámbài 'locust bean cakes'
(Ba) mázám 'blacksmith' vs. ámzám 'groaning'

In these examples, a appears between pairs of consonants which can freely abut (p + t, m + b, m + z) or before these pairs of consonants. This freedom of occurrence is not possible for short high vowels, e.g. corresponding to the first set of words in (16), *apta would be impossible in Ngizim and *peta would be impossible in Bade.

3. Bade and Ngizim Word Initial Sequences

3.1. Bade PROTHESIS. A conspicuous sound change, or better, a change in word structure, has affected Bade but not Ngizim. This change can be formulated as in (17):

(17) Bade PROTHESIS

proto-Bade-Ngizim words of the structure *#C1#C2 ...
in Bade acquire the structure *eC1C2 ...

where e = any short high vowel and C1C2 form a permissible consonant sequence in Bade.

It would be tempting to formulate this change as *#C1#C2 ... > #eC1C2 ..., but this formulation makes the change look like simple metathesis of *C1 and *e. By using the formulation in (17) and by calling this change PROTHESIS, my intention is to stress that viewing this change as a metathesis is not the correct way to conceptualize what has taken place, viz. a change in Bade in the way impermissible word initial segment sequences are avoided. The change can perhaps be viewed as involving two discrete but simultaneous steps: (i) deletion of *e between *C1 and *C2 and (ii) the consequent addition of prothetic e (what Lukas [1967/68] calls a Stutzvokal) to avoid the sequence #C1C2 ... . Or, as an alternative, more abstract analysis, we could say that proto-Bade-Ngizim (and modern Ngizim) inserted e between C1 and C2 whereas Bade now inserts e before C1C2. There are cases of true metathesis in Bade, e.g. Bade péksà,
Ngizim fěská 'face' (< *fěská ); Bade əgayú, Ngizim vəgú 'fall down' (< *vəgú ). Cases such as these differ from PROTHESIS in that no principles of organization of the phonology of Bade have been changed—two segments have merely switched place in certain lexical items. In the case of PROTHESIS, there is a change in the phonological structure of Bade—conditions or rules for the positioning of short high vowels have changed.

3.2. Comparison of Bade and Ngizim initial sequences. The environments where PROTHESIS has not applied in Bade are the same as those word medial environments where a vowel is required to prevent an impermissible consonant sequence. In (18) I have a more detailed listing of the impermissible consonant sequences of Bade (and Ngizim) than was presented in 2.3. These are the sequences which must be separated by a vowel and therefore have not permitted PROTHESIS to apply in Bade.

(18) a. identical consonants: may not come together to form geminates; this includes cases where C₁ ≠ C₂ only with respect to voicing

b. obst + obst: impermissible if (i) C₁ is a stop and C₂ is a homorganic fricative

   (ii) C₂ is glottalized (in Bade only, though Bade does allow /g/ + glottalized)

all other obst + obst sequences are permissible

c. obst + son: none permissible (except in Bade where C₁ = /g/ )

d. son + obst: all possible with the following qualifications

   (i) of nasals, only /m/ can disagree in point of articulation with C₂

   (ii) sporadic cases of m followed by s/z require epenthetic ø


e. son + son: impermissible if C₁ is n and C₂ is a semivowel

   all others permissible, with some variation where C₁ is m or where both C₁ and C₂ are nasals

Examples of all the possible sequences illustrating PROTHESIS or absence of PROTHESIS are given in Table 1. Discussion of (18) and Table 1 continues on page 266. Footnotes to Table 1 are on p. 265.
Table 1. Examples of PROTHESIS or absence of PROTHESIS in Bade

The left-hand word is from Ngizim, the right-hand word from Bade. Unless otherwise stated, the words are cognates with identical meaning. A notation such as (*bad ... ) means no words containing that sequence were found. Unless otherwise indicated, lines marked "no examples" probably represent accidental gaps. See the end of the Table for footnotes.

### OBSTRUENT SEQUENCES

<table>
<thead>
<tr>
<th>Sequence possible</th>
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</tr>
</thead>
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</tr>
<tr>
<td>lab + lab</td>
<td>bábét</td>
</tr>
<tr>
<td>lab + alv</td>
<td>Ṣptẹkú</td>
</tr>
<tr>
<td>(*bad ...)</td>
<td>Ṣbdú</td>
</tr>
<tr>
<td>(Ng) 'pull out'</td>
<td>(Ba) 'be able'</td>
</tr>
<tr>
<td>(Ba) 'ask'</td>
<td></td>
</tr>
<tr>
<td>(Ng) 'establish'</td>
<td>(Ba) 'toss up'</td>
</tr>
<tr>
<td>lab + vel</td>
<td>no examples</td>
</tr>
<tr>
<td>alv + lab</td>
<td>Ṣdbú</td>
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<td>Ṣdéóm</td>
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<tr>
<td>alv + vel</td>
<td>Ṣtkà</td>
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<td>vel + lab</td>
<td>Ṣgbàmtú</td>
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</table>

- OBSTRUENT SEQUENCES
- "no examples"
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<th>vel + alv</th>
<th>kùtù</th>
<th>ùktú</th>
<th>(Ng) 'wash w/o soap'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>gùdú</td>
<td>ugiú</td>
<td>'gourd'</td>
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<td></td>
<td>gèjì</td>
<td>ègejì</td>
<td>'thirst'</td>
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<tr>
<td>Stop + Fricative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lab + lab</td>
<td></td>
<td></td>
<td>no examples</td>
</tr>
<tr>
<td>lab + alv</td>
<td>pèśú</td>
<td>ępsú</td>
<td>(Ng) 'be worn out'</td>
</tr>
<tr>
<td></td>
<td>bèzú</td>
<td>ębzú</td>
<td>(Ba) 'bathe'</td>
</tr>
<tr>
<td>lab + vel</td>
<td></td>
<td></td>
<td>no examples</td>
</tr>
<tr>
<td>alv + lab</td>
<td>tèfú</td>
<td>ętfú</td>
<td>'enter'</td>
</tr>
<tr>
<td></td>
<td>dèví'd</td>
<td>ędvóđã</td>
<td>'night'</td>
</tr>
<tr>
<td>alv + alv</td>
<td></td>
<td>dèzhí</td>
<td>dàzí</td>
</tr>
<tr>
<td>alv + vel10</td>
<td></td>
<td></td>
<td>no examples</td>
</tr>
<tr>
<td>vel + lab</td>
<td>gùvàrú</td>
<td>ęgváalàkàu</td>
<td>'Acacia nilotica'</td>
</tr>
<tr>
<td>vel + alv</td>
<td>kùtlái</td>
<td>ụktlái</td>
<td>'children'</td>
</tr>
<tr>
<td></td>
<td>gèzhàn</td>
<td>ęgzàn</td>
<td>'Nile monitor'</td>
</tr>
<tr>
<td>vel + vel10</td>
<td></td>
<td></td>
<td>no examples</td>
</tr>
</tbody>
</table>
### Sequence possible

<table>
<thead>
<tr>
<th>Fricative + Stop</th>
<th>Sequence possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>lab + lab</td>
<td>no examples</td>
</tr>
<tr>
<td>lab + alv</td>
<td>(Ng) 'hoof'</td>
</tr>
<tr>
<td></td>
<td>(Ba) 'postpone'</td>
</tr>
<tr>
<td>lab + vel</td>
<td>(Ng) 'meet'</td>
</tr>
<tr>
<td></td>
<td>(Ba) 'throw away'</td>
</tr>
</tbody>
</table>

| lab + alv        | (Ng) 'sharpen to point' |
|                  | (Ba) 'burn'            |
| vel + lab, alv, vel | no examples           |

<table>
<thead>
<tr>
<th>Fricative + Fricative</th>
<th>Sequence possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>lab + lab</td>
<td>(*fof ...) fáfau</td>
</tr>
<tr>
<td>lab + alv</td>
<td>no examples</td>
</tr>
<tr>
<td>Obstruent + Sonorant&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>lab + vel</strong>&lt;sup&gt;10&lt;/sup&gt;</td>
<td>no examples</td>
</tr>
<tr>
<td><strong>alv + lab</strong></td>
<td>sèfú</td>
</tr>
<tr>
<td></td>
<td>(Ba) 'sweep'</td>
</tr>
<tr>
<td></td>
<td>(zàbàbìyú)</td>
</tr>
<tr>
<td><strong>alv + vel</strong>&lt;sup&gt;10&lt;/sup&gt;</td>
<td>no examples</td>
</tr>
<tr>
<td><strong>vel + lab, alv, vel</strong>&lt;sup&gt;10&lt;/sup&gt;</td>
<td>no examples</td>
</tr>
<tr>
<td>obs + nas</td>
<td>(no ex. of lab + m)</td>
</tr>
<tr>
<td></td>
<td>bènú</td>
</tr>
<tr>
<td></td>
<td>fànà</td>
</tr>
<tr>
<td></td>
<td>dàmàn</td>
</tr>
<tr>
<td></td>
<td>zàmànú</td>
</tr>
<tr>
<td></td>
<td>tlènú</td>
</tr>
<tr>
<td></td>
<td>kùnàmú</td>
</tr>
<tr>
<td></td>
<td>gàmà</td>
</tr>
<tr>
<td></td>
<td>gànú</td>
</tr>
<tr>
<td></td>
<td>gànyí</td>
</tr>
<tr>
<td>obs + liq</td>
<td>bèlàn</td>
</tr>
<tr>
<td></td>
<td>fèrà</td>
</tr>
<tr>
<td></td>
<td>tèrà</td>
</tr>
<tr>
<td></td>
<td>tlèràmú</td>
</tr>
</tbody>
</table>
Sequence possible

Ngizim Bade

gàrà̀gù [əɣiəd̪u] 'be startled'

obs + s.v.

Sequence impossible

Ngizim Bade

kàrù kàlù 'steal'

(but cf. Ba gùlù 'jealousy')

bùwà bùwà 'trip'

vìyú vìyá (Ng) 'wash'

(But cf. Ba) 'tiger nut'

(tùwàyú tùwàyú 'forget'

zhìyám zìyám (Ng) 'molar'

(kùyú kùyú (Ng) 'grasp'

(Ba) 'package'

(there are no examples of /g/ + semivowel word initial)

SONORANT + OBSTRUENT\textsuperscript{13, 14}

\begin{tabular}{llll}
\textbf{m + lab} & mbàsú & ìmbàl & (Ng) 'sit' \\
& & & (Ba) 'beer'
\hline
\textbf{m + alv} & mòdù & ìndù & (Ng) 'tie up'
\hline
\textbf{m + lab} & mpàatú & ìmpàatú & 'provide for'
\hline
\textbf{m + alv} & mètù & ìmtù & 'die'
\hline
\textbf{m + lab} & mèsaèk & ìmsèk & 'husband'
\hline
\textbf{m + alv} & mèzàmù & ìnzèmù & 'grunt'
\end{tabular}

(but cf. Ba mèzàmà a type of fish)
<table>
<thead>
<tr>
<th>Root</th>
<th>Vowel Cluster</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>m + vel</td>
<td></td>
<td>no examples</td>
</tr>
<tr>
<td>n + lab</td>
<td></td>
<td>no examples</td>
</tr>
<tr>
<td>n + alv</td>
<td>ndììwà</td>
<td>'people'</td>
</tr>
<tr>
<td></td>
<td>ñdá</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ñtú</td>
<td>'swallow'</td>
</tr>
<tr>
<td></td>
<td>ñtú</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(*n(ə)s ...)</td>
<td>'hippopotamus'</td>
</tr>
<tr>
<td>/n/ + vel</td>
<td>ñgàs</td>
<td>'spear'</td>
</tr>
<tr>
<td></td>
<td>ñgàs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ñkàltú</td>
<td>(Ng) 'care for'</td>
</tr>
<tr>
<td></td>
<td>ñkú</td>
<td>(Ba) 'fill'</td>
</tr>
<tr>
<td>r/l + lab</td>
<td>rèpú</td>
<td>(Ng) 'close'</td>
</tr>
<tr>
<td></td>
<td>èlpàatú</td>
<td>(Ba) 'weave (mat)'</td>
</tr>
<tr>
<td></td>
<td>rèvú</td>
<td>'sip'</td>
</tr>
<tr>
<td></td>
<td>èlvú</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ràbú</td>
<td>'move'</td>
</tr>
<tr>
<td></td>
<td>èlbú</td>
<td></td>
</tr>
<tr>
<td>r/l + alv</td>
<td>rèdú</td>
<td>'crawl'</td>
</tr>
<tr>
<td></td>
<td>ñdú</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rèjú</td>
<td>'moisten'</td>
</tr>
<tr>
<td></td>
<td>ñljú</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ñdú</td>
<td>(Ng) 'stop'</td>
</tr>
<tr>
<td></td>
<td>ñdàyú</td>
<td>(Ba) 'melt'</td>
</tr>
<tr>
<td>r/l + vel</td>
<td>règú</td>
<td>'migrate'</td>
</tr>
<tr>
<td></td>
<td>èlgú</td>
<td></td>
</tr>
<tr>
<td>y/w + lab</td>
<td>lìvú</td>
<td>(*lìv ...) 'leave'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>no w + lab</td>
</tr>
<tr>
<td>y/w + alv</td>
<td>wùtú</td>
<td>'go to meet'</td>
</tr>
<tr>
<td></td>
<td>ñutú</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>no y + alv</td>
</tr>
<tr>
<td>y/w + vel</td>
<td>lìkáu</td>
<td>'see'</td>
</tr>
<tr>
<td></td>
<td>lìkáu</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>no w + vel</td>
</tr>
<tr>
<td></td>
<td>Sequence possible</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>m + n</td>
<td>mènù</td>
<td>mènù</td>
</tr>
<tr>
<td>m + liq</td>
<td>mèràk</td>
<td>mèlèk</td>
</tr>
<tr>
<td>m + s.v.</td>
<td>mìyá</td>
<td>mìyá</td>
</tr>
<tr>
<td>n + m</td>
<td>nèmìyú</td>
<td>ìélìyú</td>
</tr>
<tr>
<td>n + liq</td>
<td>no examples</td>
<td>nèmù</td>
</tr>
<tr>
<td>n + s.v.</td>
<td>no n + w</td>
<td>nìyú</td>
</tr>
<tr>
<td>r/l + m</td>
<td>ràmàu</td>
<td>ìílmàu</td>
</tr>
<tr>
<td>r/l + n</td>
<td>rnú</td>
<td>rnú</td>
</tr>
<tr>
<td>r/l + s.v.</td>
<td>rùwái</td>
<td>ìílwái(^{9})</td>
</tr>
<tr>
<td>r/l + s.v.</td>
<td>rìyàk</td>
<td>ìílyàk(^{9})</td>
</tr>
<tr>
<td>y/w + nas</td>
<td>wùnù</td>
<td>ìùnù</td>
</tr>
<tr>
<td></td>
<td>(*wùn ... )</td>
<td>ìínlà</td>
</tr>
<tr>
<td>y/w + liq</td>
<td>wùrà</td>
<td>ìúlù</td>
</tr>
<tr>
<td>y/w + s.v.</td>
<td>yùwàn</td>
<td>ìíwàn</td>
</tr>
<tr>
<td></td>
<td>(*wùy ... )</td>
<td>ìúyù</td>
</tr>
</tbody>
</table>
There is a strong vocalic transition between the consonants but this seems not to be perceived by speakers. It is probably also present between corresponding voiceless consonants but is not so obvious because it is voiceless. I did not investigate which sequences of consonants have the strongest such transitions or how systematic it was.

There are no velar fricatives in Ngizim or the Gashua dialect of Bade. In Gashua Bade, reconstructable *x̌ and *γ̌ have changed to k and g; in Ngizim their fate is somewhat more complicated and need not concern us here. The Western and Southern dialects of Bade do preserve *x̌ and *γ̌, usually pronounced [h] and [ŋ] respectively, though noticeable velar friction can still be heard with some speakers. These sounds are relatively infrequent so that there are lexical gaps for most potential sequences involving velar fricatives. Of stop + fricative sequences only the word ḏèhán 'land' is found (cf. Gashua dialect ḏēkā). Absence of PROTHESIS suggests that h now functions as a sonorant though it was originally an obstruent.

See fn. 10. An example of h + d is ḏadawú 'dry up' (cf. Gashua Bade kədəwú).

Western Bade has velar fricative + sonorant separated by high vowels in hūnú 'flay' (cf. Gashua Bade kənu), hərū 'save' (cf. Gashua kəlú), and hūyú 'package' (cf. Gashua kuyú).

In Ngizim, word initial nasals followed by a homorganic voiced stop form a prenasalized stop; the nasals are syllabic before other consonants. In Bade, all word initial nasals followed by a consonant are syllabic.

Western Bade has sonorant + velar fricative sequences in ḏhwú 'fill' (cf. Gashua ḏku) and ḏhu 'say' (no cognate in Gashua).

The examples cited here may not have been original *yiC ... at all. Initial *i must be reconstructed for the proto-language (see fn. 3); these may be survivals of this vowel, which has been lost in Ba and Ng nouns.

Both Ngizim and Gashua Bade have alternative pronunciations ləmú. This results from a fairly common dissimilation of *ŋ > l when a nasal follows. Western Bade has only ləmú for this word.
Geminate consonants are not found in native words in Bade or Ngizim except where they are separated by a morpheme boundary, e.g. Bade /wûn-li/ → [wúlî] 'his son', Ngizim /àasék-gú/ → [àaséggú] 'the market'. Abutting obstruents must agree in voicing, so this restriction prevents pâbèt 'ashes' from becoming *apbèt or *ebbèt, etc. Geminates do occur in a few borrowed words, e.g. Ng kákkadì, Ba kákkadû 'paper' from Kanuri.

(i) The only examples of stops followed by homorganic fricatives involve alveolars as in Bade dôzí 'vein', which does not become *dôzí; the absence of *pef..., *bav..., and the absence of *kôh..., etc. in Western Bade (cf. fn. 10) may or may not be systematic gaps in the lexicon. (ii) The restriction in Bade against the sequence obstruent + glottalized consonant which seemed to be lexical in the middle of a word (cf. (15) and discussion) is nearly absolute in word initial position, i.e. there are words like Bade sôdû 'wash' but no *sôsôdû, etc. The only exception is /g/ + glottalized consonant. Here, PROTHESIS has applied, *g has shifted to w, and the initial high vowel has assimilated to it by rule (6), ultimately giving initial long [uu], e.g. [ûuû] 'moisten' < *gùgù.

Aside from the above restrictions, all obstruent sequences are possible with the priviso in the discussion of (18a) above that abutting obstruents must agree in voicing. The voice feature of obstruents in both languages is heavily determined by environmental factors. Not only is there the rule that abutting obstruents must agree in voice but also the ubiquitous rule of final devoicing, e.g. Ng màgèráf, Ba màgèláf 'visitor' with underlying final /v/ as evidenced in the plurals màgèrávàvín and màgèlàlvón respectively (Ngizim also has an alternative plural màgèràfcín where /v/ is devoiced preceding the voiceless c). Moreover, Ngizim has undergone a sound change assimilating an original voiceless obstruent to voiced if the next syllable begins in a voiced obstruent, e.g. Ng gâazá 'chicken' (cf. Hausa kàazá). Bade has undergone just the opposite dissimilation process of devoicing an original voiced obstruent if the next syllable begins
in a voiced obstruent, e.g. Ba kádúwà 'Grimm's duiker' (cf. Hausa gàdáà ). Given the unstable nature of the voicing feature of ob-
struents in this language group, it is not surprising to find that
PROTHESIS in Bade has applied with obstruent sequences, whether or
not the consonants originally agreed in voicing, e.g Ba àzú 'six'
(cf. Hausa shídà), ègđém 'crocodile' (cf. Hausa kàdàa).

(18c) Both in the middle of a word and word initial, the re-
striction against the sequence obstruent + sonorant is absolute. The
relaxation of this restriction for /g/ + sonorant in Bade (but not
Ngizim) shows some dialect variation in Bade. Gashua Bade has gone
about the furthest of any dialect here, but even Gashua Bade speakers
freely allow pronunciations such as gòmá 'thigh' and gèlèbú
'starle' as alternatives to the pronunciations given in Table 1.
Also, a few lexical items seem not to admit a variant where PROTHESIS
has applied (see Table 1).

In sequences where obstruents are generally disallowed as the
first of abutting consonants, then, the restriction in Bade has been
relaxed only for /g/. But even here a phonetic [g] is not found. In
(19) the effects of following consonants on /g/ are summarized:

(19) /g/ → [w] / _____ [+glottalized]
      [g] / _____ [+nasal]
      [ŋ] / _____ [[+sonorant]
           [+nasal]]
      [g] elsewhere

___________________________
17These sound changes have affected obstruents only when the following
syllable began in a voiced obstruent. Thus, Ngizim has kàrù 'steal'
without voicing of k (cf. Karekare čàrù-) and Bade has gàlú 'grow
old' (cf. Kirfi gàålò 'old') without devoicing of g. There are no
productive alternations resulting from these changes in Ngizim or Gashua
Bade, but in part of the Western Bade area alternations such as the
following are found: tè-jlàwì 'seated' but dè-tlàwà 'pierced'.

18Though there are no words with original *#/giy ... > #ày ...,
Bade /g/ → [ŋ] / ____y was seen in màyyà 'ratel' in (13). I know of
no words with the original sequence *#guw. Presumably these would be-
come [g*] in Bade since labialized velars contrast with plain velars,
e.g. gàyîm 'cat', gwàyî 'Acacia albida'.
Since [ŋ] and [γ] are not phonemic, words with these phonetic consonants can still be analyzed as having underlying /g/. Variant pronunciations with [g] probably protect the underlying status of /g/ in such words. Note that there are some words without variant pronunciations where original *g before liquids has become [w], causing merger with original *w, e.g. ñulâi 'hare'—cf. Western Bade ágúrén.

(18d) Sonorant + obstruent sequences are all possible. Only the sequence m(ə) + obstruent needs some comment. The phonemic nasals are /m, n, ny/, but only m may disagree in point of articulation with a following obstruent, e.g. m̩tû 'die' but no *nb ..., *nyt ..., etc. There are no words in either Bade or Ngizim with the sequence m + velar. The absence of an initial sequence *mə + velar is probably an accidental gap (the word *mæ̱gïyá 'ratel' seen in (16) has such a sequence, but Bade has changed this to [mə̱γïyá], not *æ̱mgïya). The absence of such sequences within a word is apparently the result of an old assimilation process *m > n / ____ velar, which is probably no longer productive. Evidence for this assimilation is found in the single word [dãŋkú] 'sew' in both languages (cf. Hausa ñm̩mɔ́) with the Bade verbal noun ñm̩má. The antiquity of the assimilation is seen from the reanalyzed Ngizim verbal noun, ñm̩má, with /n/ substituted for */m/.

PROTHESIS has always applied in Bade when the consonant following m is any labial or when it is an alveolar stop. It has usually applied when the next consonant is an alveolar fricative, e.g. m̩m̩zəmú 'groan', but with a few lexical items it has not, e.g. m̩z̩m̩sá 'the fish Gymnarchus niloticus', m̩z̩m̩lí 'day after tomorrow'.

(18e) With the sole exception of n + semivowel, all sonorant sequences are possible. There are no examples of original *nuw ..., but words such as Bade kàancínwà 'merciful' suggest that *nw is impossible as is the sequence n + y illustrated in Table 1. When C₁ is m there is some variability if the next consonant is n or a liquid (the only word with m semivowel is 'mouth', which has variants both with and without PROTHESIS in Bade). The only words I found with *mən ...
are given in Table 1: Bade has undergone PROTHESIS in one but not the other. If $C_1$ is $m$ and $C_2$ is a liquid, some words have variants with and without PROTHESIS ($mələk = mələk 'oil'$), some do not have a variant with PROTHESIS ($mələf 'beard'$).

Original *$n$ can abut with $m$ but in the only examples that I know of in Gashua Bade, *$n$ has dissimilated to [], viz. əlməiyù 'flood' and kəlmù 'beat drum' (cf. Bade verbal noun kənám = kələm and Ngizim kənəmù ). Even the word nəmù 'build', where for some reason PROTHESIS has not applied, there is a variant pronunciation ləmù (cf. fn. 16). Note that there are variants with [n] and [] only where the phoneme in question was originally *$n$, not where it was a liquid (cf. Bade əlməu = ləməu 'run away' < *rəməu, but never *nəməu/*ənəməu). There are no examples of $n +$ liquid. This may or may not be an accidental gap, but note that $n +$ liquid would become a geminate liquid by a productive assimilation rule, e.g. Ba /wún-1]/ → [wùll] 'his son'.

In Bade when PROTHESIS has applied where $C_1$ is a nasal or liquid, the phonetic result is not always ACC ... . Rather, no initial ə is found, nasals become syllabic, and liquids become syllabic before alveolars¹⁹ (but not consonants at other points of articulation). This is consistent with the analysis of the change in Bade on p. 256, where I stated that the initial ə was a prothetic vowel added to avoid an initial consonant sequence, not the original *ə which had switched places with the preceding consonant. In those cases where the initial consonant can itself constitute the full syllable, no prothetic vowel is needed for this purpose.

¹⁹ Two sound changes are relevant here. The original */r/ of proto-Bade/Ngizim (perhaps proto-Chadic) was phonetically a "retroflex flap" as it still is in Ngizim (see Ladefoged [1964] for a phonetic description of the same sound in Hausa). In Bade/Ngizim (and probably proto-Chadic) this phoneme is realized as an alveolar tap or trill when followed by alveolar non-continuants (f, d, ð, n) or lateral fricatives. In Gashua Bade the retroflex flap, but not the laveolar tap/trill has changed to l. Thus, while Bade has əlvù 'sip' and Ngizim has [rəvú] with a retroflex flap initial, both languages have [rənú] 'fornicate' with syllabic alveolar trill.
In Ngizim where $C_1$ is a sonorant, original $^*C_1aC_2$ ... has changed to give phonetic results similar to those in Bade. The cases in point can be summarized by the following ordered rules:

(20) a. $\varepsilon \rightarrow \emptyset$ / m ___ labial e.g. mbåsú 'sit'
    / n ___ alveolar, velar e.g. ndiìwà 'people' /ngås/ 'spear'
    / r ___ alveolar e.g. ṛðú 'crawl' ṛnú 'fornicate'

b. $n \rightarrow \eta$ / ____ velar e.g. ngås $\rightarrow$ [ŋås] 'spear'

c. $[C^{+\text{son}}] \rightarrow [+\text{syllabic}] / # ____ C$

except nasal followed by homorganic voiced stop
  e.g. ṛmpåatú 'provide for'
  ṛtíú 'swallow'
  ṛðú 'crawl'

The main rule in (20) is part a. While the phonetic effects of (20a) in Ngizim are identical to those of Bade PROTHESIS, except for the non-syllabicity of nasals followed by homorganic voiced stops (cf. (20c)), I believe the process must be viewed in a different way. On p. 256 I argued that Bade had developed a new way to handle word initial sequences where the first two consonants could abut, viz. the consonants are allowed to abut and the impermissible initial cluster is avoided by adding a prothetic vowel. There is no evidence for such a process in Ngizim. Here, a high vowel has simply been deleted in $#C_1aC_2$ where $C_1$ could itself constitute a full syllable or, in the case of nasals followed by homorganic voiced stops, where it could combine with the following consonant to constitute a unit phoneme.

3.2.1. The influence of initial high tone. So far no mention of tone has been made with respect to Bade PROTHESIS. However, inspection of the illustrations in Table 1 will show that in all words where PROTHESIS has occurred, the word begins with low tone. A reasonable suggestion would be that the prothetic vowel is automatically given low tone. This hypothesis is disconfirmed in two ways: first all the Ngizim cognates
have initial low tone, making it likely that the words should all be reconstructed with initial low tone; second, and more important, are Bade examples such as the following, where PROTHESIS has not applied:

(21) páj | 'bran' | cf. àpçàalàkáu 'the plant Calotropis procera'
tóbà | 'round cover' | cf. èdbú 'establish'
dàgà | 'platform' | cf. èdgà 'arrow'
dúkwàk | 'udder' | cf. èdkwái 'iron'
kúvá | 'chest' | cf. ègvàalàkáu 'Acacia nilotica'
kúzìyák | 'swollen scrotum' | cf. èksódù 'be familiar with'
súgùm | 'planting hoe' | cf. èzgòmú 'plant'
sávùwà | 'bee' | cf. èzvú 'join'
gúmà | 'ten' | cf. [èmá] 'thigh'
lévùwà | 'chaff' | cf. èlvú 'sip'
wúdú | 'knife' | cf. ùutú 'go to meet'
mósáakáu | 'tamarind' | cf. ìsòk 'husband'
wúnìyà | 'girl' | cf. ìùnú 'spend the day'
míyà | '100' | cf. ìyá 'mouth'
wíyàk | 'vulva' | cf. ìuyú 'hang'

The only relevant difference between the words in the left-hand column, where PROTHESIS has not applied, and those in the right-hand column, where it has, is the tone on the first syllable. A careful examination of the Bade nominal lexicon reveals that all words where PROTHESIS has applied have initial low tone and the large majority of those where PROTHESIS could potentially have applied but has not have initial high tone. I will return to the few exceptions to this statement in 3.2.3.

Nouns have fixed lexical tone so nouns can be categorically listed as having initial high or low tone. Underlying tone of verbs is not so obvious since tone is in part conditioned by verb aspect. However, it is a reconstructable feature of proto-Bade/Ngizim as well as a feature of the modern languages that verbs having *Ce as the initial syllable have a verbal noun with initial low tone. It is not at all clear that
the verbal noun should be taken as the underlying form of the verb, but all verbs of the original structure \(*C_1\sigma C_2V\) where \(C_1\) could abut with \(C_2\) have undergone PROTHESIS whereas verbs with other reconstructed syllabic structures have not (but see section 3.2.2). This restructuring of original \(*C_1\sigma C_2V\) verbs may have been reinforced by the low tone which verbs take in other aspects (perfective, second subjunctive).

The question which arises is why high tone has prevented PROTHESIS. A final explanation would require a more careful phonetic study than I was able to make, but in Schuh [1977b] I suggest that the extra amplitude associated with high tone was enough to prevent weakening of the \(\sigma\) separating \(C_1\) and \(C_2\) to the point where it could be lost. Since the \(#C_1\sigma C_2\) ... structure was thus maintained, no prothetic vowel was needed.

3.2.2. Syllabification with longer sequences. The discussion above has concentrated on examples where Ngizim has \(C\sigma CV\) and Bade has \(\sigma CCV\) with the remainder of the word being the same, other things being equal. There are words with three or more consonants, \(C_1C_2C_3\), where both the sequence \(C_1C_2\) and the sequence \(C_2C_3\) are permissible. If \(C_2\) and \(C_3\) are allowed to abut, PROTHESIS would not be possible in Bade because PROTHESIS in a word of the structure \(C_1\sigma C_2C_3\) would form an impermissible three consonant cluster. On the other hand, if \(C_1\) and \(C_2\) are allowed to abut through PROTHESIS, \(C_2\) and \(C_3\) will have to be separated by \(\sigma\), again to prevent a three consonant sequence, giving a word structure \(\sigma C_1C_2\sigma C_3\) ... . With a number of exceptions, Bade has chosen the latter strategy so that words of the form \(\sigma C\sigma C\) in Bade correspond to words of the form \(C\sigma CC\) in Ngizim. In words where \(C_2\) and \(C_3\) cannot abut, Bade again has \(\sigma CC\sigma C\) but Ngizim has \(C\sigma C\sigma C\) ... ; where \(C_1\) and \(C_2\) cannot abut, both languages have \(C\sigma CC\) ... ; where \(C_1\) cannot abut with \(C_2\) nor \(C_2\) with \(C_3\), both languages have \(C\sigma C\sigma C\) ... . Examples of all these combinations are given in Table 2.

\[20\] This strategy of syllabification in Bade is consistent with the position into which \(\sigma\) is inserted as illustrated in (10a), viz. between the second and third consonants rather than the first and second.
Table 2. **Examples of syllabification in words with 3 or more consonants**
The left-hand column is Ngizim, the right-hand column is Bade.

C₁, C₂, and C₃ can all abut

<table>
<thead>
<tr>
<th>Ngizim</th>
<th>Bade</th>
</tr>
</thead>
<tbody>
<tr>
<td>dàgzú</td>
<td>ãdgèzú</td>
</tr>
<tr>
<td>pòstú</td>
<td>ãbzèkú</td>
</tr>
<tr>
<td>zùktú</td>
<td>ãżgètú</td>
</tr>
<tr>
<td>ràptú</td>
<td>ãlbètú</td>
</tr>
<tr>
<td>ràbgú</td>
<td>ãlbègú</td>
</tr>
</tbody>
</table>

C₁ and C₂ can abut, C₂ and C₃ cannot

<table>
<thead>
<tr>
<th>Ngizim</th>
<th>Bade</th>
</tr>
</thead>
<tbody>
<tr>
<td>(gùjlàjlú)</td>
<td>ãgùjlàjlú</td>
</tr>
<tr>
<td>gùjlàjlùr</td>
<td>ãgùjlàrgùjlár</td>
</tr>
<tr>
<td>sèkùnú</td>
<td>ãskùnú</td>
</tr>
<tr>
<td>mèzèmù</td>
<td>ãnzèmú</td>
</tr>
<tr>
<td>nèmìyù</td>
<td>ãlmìyù</td>
</tr>
</tbody>
</table>

C₁ and C₂ cannot abut, C₂ and C₃ can

<table>
<thead>
<tr>
<th>Ngizim</th>
<th>Bade</th>
</tr>
</thead>
<tbody>
<tr>
<td>tèrkú</td>
<td>tèlkú</td>
</tr>
<tr>
<td>vèrdā</td>
<td>vèrdâ</td>
</tr>
<tr>
<td>bèntú</td>
<td>bèntú</td>
</tr>
<tr>
<td>sèmdù</td>
<td>sèmdû</td>
</tr>
</tbody>
</table>

Neither C₁ and C₂ nor C₂ and C₃ can abut

<table>
<thead>
<tr>
<th>Ngizim</th>
<th>Bade</th>
</tr>
</thead>
<tbody>
<tr>
<td>(jìlàbèrû)</td>
<td>tìlàbèlù</td>
</tr>
<tr>
<td>(wùdû)</td>
<td>kàdùwù</td>
</tr>
<tr>
<td>dèmìyù</td>
<td>----</td>
</tr>
<tr>
<td>gùgùyû</td>
<td>----</td>
</tr>
</tbody>
</table>
High tone on the initial syllable has prevented $C_1$ and $C_2$ from coming together in Bade just as illustrated in (21) for words of the structure $C_1\overline{C}_2V \ldots$. Thus, for words in Bade beginning with high tone, when $C_2$ and $C_3$ can abut they do; when they cannot abut they are separated by a high vowel, but always with a high vowel separating $C_1$ and $C_2$ as well. The examples in (22) are all from Bade.

(22) $C_2$ and $C_3$ can abut $C_2$ and $C_3$ cannot abut

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>légdà</td>
<td>'ladle'</td>
<td>cékúdák</td>
</tr>
<tr>
<td>düksù</td>
<td>'the weed <em>Mitracarpum scabrum</em>'</td>
<td>dükúmák</td>
</tr>
<tr>
<td>sógvà</td>
<td>'spur-winged goose'</td>
<td>kútéru</td>
</tr>
<tr>
<td>gúskwàk</td>
<td>'worm'</td>
<td>métlélèm</td>
</tr>
<tr>
<td>kúzvú</td>
<td>'female slave'</td>
<td>wújálài</td>
</tr>
<tr>
<td>[lɔyyá]</td>
<td>'small calabash'</td>
<td>sáviyàk</td>
</tr>
<tr>
<td>[cáŋnà]</td>
<td>'molar'</td>
<td>lèvùwà</td>
</tr>
<tr>
<td>würjí</td>
<td>'scorpion'</td>
<td></td>
</tr>
<tr>
<td>würnàk</td>
<td>'burnt mush'</td>
<td></td>
</tr>
</tbody>
</table>

There are very few words with four or more consecutive consonants where any two consecutive consonants could abut and where only short high vowels intervene. The only two examples, aside from a number of reduplicated forms (see section 3.2.3), that I have found in Bade are tèkpèsú 'begin' and màskètú 'turn'. Words such as those in the first two sections of Table 2 suggest that the principle behind Bade PROTHESIS might be stated as in (23):

(23) "(1) If the first two consonants of a root form a permissible sequence and are not separated by a vowel other than a short high vowel, let those consonants abut and add prothetic $a$; (2) if no vowel follows $C_2$, add epenthetic $a$ and proceed by grouping the next two consonants if possible."

Such a principle would predict *tèkpèsú* and *màskètú*. In fact, there are no words in the language which have been syllabified in this way
where the proto-form was \( \text{*C\text{C}C\text{C}\text{C}C} \) ... \(^{21}\) I have no formal explanation for why \( \text{t\text{\text{a}k\text{\text{p\text{a}}}}\text{\text{\text{\text{s\text{u}}}}} \) has not become \( \text{*\text{\text{\text{\text{\text{\text{\text{\text{a}}}k\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\t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"Obligatory vowel" here will be either a high vowel which separates two consonants which cannot abut or a "lexical" vowel, i.e. a mid or low vowel or a long high vowel, the position of which is not predictable. The principle in (24) almost works in general for the language but fails to predict the word shapes in the first two sections of Table 2, which encompass a fairly substantial number of words. In (25) are some examples of words syllabified according to (24). In column (a) the "obligatory vowel" follows C2 so that C1 and C2 abut and require the prothetic a. In column (b), the "obligatory vowel" follows C3. Even though C1 and C2 could potentially abut in these words, they do not since by principle (24), it is C2 and C3 which must abut, requiring that a a be inserted between C1 and C2. The obligatory vowel is underlined.

(25) a. m̀s̀s̀s̀awà 'the plant Guiera senegalensis' b. m̀d̀v̀l̀yàk 'biting ant'
    úg̀z̀m̀t̀m 'marabou stork' bùg̀z̀r̀á 'lying dead'
    èg̀v̀àal̀kàù 'Acacia nilotica' kùtfèlù 'untie'
    èz̀v̀àiýù 'wash grain' cèkpàpù 'squat'
    èg̀b̀àkwàtù 'decay' tììk̀pàlù 'go mad'
    è̀g̀̀r̀àmtù 'gallop' tègb̀b̀̀d̀ù 'slosh out'

Note that principle (24) predicts tòkpàsù no better than (23). In this word the first obligatory vowel is the final one and (24) would thus give the incorrect *èćìk̀psù .

3.2.3. True exceptions and morphologically conditioned exceptions to PROTHESIS. The environments where Bade PROTHESIS has taken place are governed by three essential factors: (1) the initial syllable of the word must bear low tone; (2) C1 and C2 are not prevented from abutting by one of the factors listed in (18); (3) the principle of
syllabification in (23) must not be overridden by that in (24), which applies mainly to words of three or more syllables. There are some true exceptions to PROTHESIS—words where no phonological or morphological factors predict that the word should not have undergone PROTHESIS, e.g. dàgàrìyà 'barb' (a type of fish), dèvàaràk 'crownbird', gàtèl 'abandoned town site', gùtlàmìlàm 'strong smell', dùgwù 'hear'. In the materials I collected, true exceptions such as these total only 10-15 as opposed to well over 200 words where PROTHESIS has applied. Besides these true exceptions, there are several classes of apparent exceptions which have resisted PROTHESIS for morphological or other reasons.

Relatively recent borrowed words have not been affected by PROTHESIS, e.g.

(26) gùzàrì 'provisions' < Hausa gùzúrì
dèpú '1000' < Kanuri débú
kèské 'easy' < Kanuri kèské

Two types of verbal nouns have not been affected by PROTHESIS. One type, illustrated in (27a), derives from verbs of the shape CaCV. These verbal nouns end in -i and the underlying /a/ of the initial syllable assimilates in height to this -i to become ø. The verbs 'die' and 'know' have irregular verbal nouns of a similar structure and have not been affected by PROTHESIS, though interestingly the verbs have been. The second type of verbal noun, illustrated in (27b), is derived from some verbs of the structure CVCCu. These verbal nouns have the structure CV1CV2C where V1 is the vowel of the first syllable of the verb root and V2 is sometimes the same as V1, sometimes ø even where V1 is ø.

(27) a. kàtí 'returning' < kàtáu 'return'
gèfí 'catching' < gàfàu 'catch'
wùnì 'sending' < wànú 'send'
màtú 'death' < màtú ‘die'
sàgí 'knowledge' < àzgáu 'know'
b. ṭàkàtl < ṭàktlu 'tracing'
dègè < dègzú 'copulate'
lùwái (= àlùwái) < lùuyú 'farm, hoe'

(but cf. ùgďaf) 'child on back' < kùdvú 'carry on back'

Next, statives, which are derived from verbs with a prefix de- , have been preserved with initial de- with all verbs.

(27) c. dàkwáadā < kwáadú 'spoil'
dàbakí < bákú 'roast'

Finally, reduplications have uniformly resisted restructuring to permit PROTHESIS.

(28) dàgdàkí 'perch (fish)'
dèvdèfá 'greasy'
càkcàkú 'sift'
sùksùkwú 'loosen'
kùgzùzú 'teach'
kàtkàtú 'scratch ground'

To permit PROTHESIS these words would have to be totally restructured, e.g. *àckàckú. Their failure to undergo PROTHESIS may be explained as well by resistance to this type of restructuring (cf. discussion of tàkpasú, p. 275) as by their reduplicated structure.

4. Bade/Ngizim and Universal Principles of Syllabification

The discussion to this point has concentrated on noting sequences of segments which are possible or impossible and designating how such sequential restrictions are maintained by placement of vowels. In this section I hope to show how a single statement for possible syllable types in Bade/Ngizim, combined with certain hierarchies of segments, can unify what has been basically a list of restrictions.

The general principle restricting possible Bade/Ngizim syllable types can be stated as in (29):
No syllable in Bade or Ngizim may have more than one consonant at either margin, i.e. the maximum syllable is CVC.

This automatically accounts for the impermissible sequences CCC, #CC, and CC#. In order to account for the permissibility or impermissibility of the sequences listed in (18), we must refer to some proposed universal hierarchies of consonant types and principles of syllabification.

Observations on the organization of phonological segments dating at least to Saussure and supported by a variety of phenomena in a number of languages point to hierarchies of consonantal "strength" along certain parameters (some of the linguists most recently concerned with this issue are Foley, Vennemann, and Hooper—see Hooper [1976:195 ff.] for references and discussion). The most frequently noted hierarchy is along a parameter called "sonority" or "openness". Cross-cutting this hierarchy are two further hierarchies, given in (30b) and (30c):

(30) a. Sonority: stop > fricative > nasal > liquid > semivowel
    b. Phonation type: voiceless > voiced > glottalized
    c. Point of articulation: labial > alveolar > velar
   (read > "is stronger than")

In addition to these hierarchies based on inherent characteristics of segments there are hierarchies of strength associated with position of a segment in a string of segments. Of interest here is the relatively greater strength of syllable initial position over syllable final position, evidenced by such phenomena as the frequency of neutralization or loss of syllable-final consonants as opposed to the relative infrequency or non-existence of such phenomena in syllable initial position. Positional strength correlates with inherent strength of segment types, so there is a rough hierarchy of suitability for initial and final positions in syllables [Hooper 1976:196]. Those segment types in descending order from left to right in (30a) are more "suitable" as syllable initial consonants, those ascending from right to left as
syllable final. This is seen, for example, from the fact that in many languages, syllable initial sequences such as tr, zy, etc. are possible, whereas rt, yz are rare if they exist at all. On the other hand, many languages allow only sonorant consonants in syllable final position, whereas few if any allow only obstruents in this position.

Languages show minor individual variations in the hierarchies in (30) and variations in the way syllabification is done, e.g. some languages have ambisyllabic consonants while others do not, in some languages morphological boundaries affect syllabification, etc. Nevertheless, there is a high degree of cross-language predictability of how strings of segments will be syllabified which follows from the observations above. The three following statements for Babe and Ngizim would have counterparts in many languages: (1) a weak segment can always come in direct sequence with a following strong one since syllabification will always be between the two segments, e.g. Ngizim t rents ' orphan' because the sonorant r is weaker than the stop k (the symbol = represents syllable boundary); (2) a segment can usually come in direct sequence with one of relatively equal strength since syllabification will normally be between the two, e.g. Bade/ Ngizim ap=ta 'flour', but there is some variation with certain pairs of segments (see below); (3) a strong consonant cannot occur in direct sequence with a relatively weak one because syllabification would come at the beginning of the sequence, e.g. there could be no word */ta=kr u*. This would be syllabified to=kr u, as such sequences invariably are in languages that allow them, producing an impermissible syllable of the shape CCV, disallowed in Bade/Ngizim by (29). Bade and Ngizim assure that such syllables will not occur by requiring that a vowel separate such sequences of consonants; words which have as their first two consonants a strong consonant followed by a weak one comprise the largest set of cases where PROTHESIS has not taken place in Bade.

With these observations in mind, let us consider in turn each of
the types of segment sequences listed in (18b-e). 23

- **obstruent + obstruent:** Nearly all such sequences are possible, indicating that the strength differential between obstruents is not great. A stop may even be followed by a non-homorganic fricative, e.g. Ba ətfú 'enter'. But if the fricative is homorganic to the stop, i.e. if everything between the segments is equal except their relative position on the sonority hierarchy, then they cannot occur in sequence, e.g. Ba ədzí 'vein' (not *ədzí). In (30b) glottalized stops are claimed to be weaker than non-glottalized. This accounts for the fact that PROTHESIS has never taken place in Bade words where the first two consonants are plain obstruent + glottalized stop. The relative weakness of glottalized stops is supported by independent evidence as well: Le Saout [1974] describes a variety of phenomena in some Kwa and Mande languages where glottalized sounds pattern with sonorants, not obstruents; in Hausa, glottalized k in some dialects is weakened to ʔ (classed as a glide in some frameworks), not to a corresponding obstruent; tonal phenomena in Bade are more easily described if glottalized sounds are classed with sonorants than with obstruents. Nonetheless, glottalized stops must not be radically weaker than plain obstruents since there is no restriction on other obstruents abutting with them in Ngizim, and word internal in Bade, the restriction is only sporadically observed (see (15) and discussion).

- **obstruent + sonorant:** Such sequences are impossible, except for /g/ + sonorant in Bade. Recall, however, that when this sequence occurs in Bade, /g/ changes to [w], [ŋ], or [ʁ] depending on what follows (see (19)), so that the phonetic form of the word will automatically be syllabified between /g/ and the next consonant. 24 The

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23 In (18a) sequences of identical consonants, i.e. geminate consonants, are excluded. This restriction is unrelated to questions of syllable structure. In the few words where geminates are found, syllabification is between the consonants.

24 This is assuming that the sound symbolized ɣ is classed as a sonorant rather than an obstruent. This is reasonable, considering the phonetic facts. The ɣ is very lightly articulated, approaching [ŋ].
question is why /g/, an obstruent, should be allowed to abut with sonorants in the first place. The answer seems to be that /g/ is virtually the weakest obstruent in Bade (being velar, it is at the weakest point of articulation, and being voiced it is the weakest velar, since there is no glottalized velar). It therefore approaches sonorants in the strength hierarchy and with the slight phonetic adjustments which are made it can be brought down to equal strength with sonorants, hence calling for a syllable boundary between it and the following sonorant rather than before it. This borderline status of /g/ on the strength hierarchy also provides an explanation for why some words in Bade show variant pronunciations, e.g. ṣmá = gèmá 'thigh', and others do not allow /g/ to abut with a sonorant at all, e.g. gàná 'like, as', gùlú 'jealously'. While the placement of syllable boundaries with most consonant sequences can be unequivocally determined, e.g. =trV but never *t=rV, b=g but never *=bg, the placement of syllable boundary with /g/ + sonorant is less firm. The result is that whether /g/ is allowed to abut with a following sonorant has been determined on a word by word basis.

- **sonorant + obstruent**: All such sequences are possible with sporadic lexical exceptions where m is followed by s or z (see below for discussion).

- **sonorant + sonorant**: Most such sequences are possible, but there is more variation here than with other types of sequences. This is especially true in the cases where one of the consonants is a nasal. If the first consonant is /n/ and it is followed by a nasal, it frequently dissimilates to [l], in which case it may come in contact with a following nasal since liquids are weaker than nasals, e.g. ìlmìyú 'flood' < *ènmìyú. However, /m/ never dissimilates and it is with /m/ as the first of the sequence that the most variation occurs. Nasals are ambivalent since by their oral closure they resemble obstruents, yet by their non-obstructed airflow they are sonorants. Because of this ambivalence we find variation in whether m may come in contact with s or z (i.e. fricatives, which fall immediately above nasals in
strength) and with other sonorants (liquids, which fall immediately
below nasals in strength). For specific examples, see above, p.268.

In summary, we see that hierarchies of "strength" and principles
of syllabification that have been proposed as possible universal
features of language allow us to predict fairly accurately the types
of consonants which may or may not occur in sequence in Bade and
Ngizim, when combined with the statement of permissible syllable types
given in (29). This means of predicting possible sequences of con­
onants in turn allows us to predict where the change termed PROTHESIS
could occur in Bade.

REFERENCES


University Press.

presented at the 11th Congress of the West African Linguistic
Society, Yaoundé, Cameroon, April 1-5, 1974.

Lukas, Renate. 1967/68. "Das Nomen im Bāde (Nordnigerien)." Afrika


This paper is a description of Iraqw syntax and a characterization of a particular nominal suffix which appears to signal syntactic inaccessibility to certain rules. It will be proposed that this suffix signals inaccessibility that is the result of a demotion in grammatical relation of the particular object NP's under consideration. That is, the suffix signals both relational demotion and a concomitant syntactic inaccessibility.

0. Introduction

The paper will begin with a short description of some basic aspects of Iraqw syntax relevant to this discussion. Then, more complicated two-object verb paradigms are discussed. After this, various syntactic rules will be shown to operate on certain object NP's, and the restrictions on these rules will be discussed. The paper concludes with a characterization of a certain nominal suffix which signals relational demotion and syntactic inaccessibility.

1. Background Information

Iraqw is spoken in Mbulu Region in Tanzania and has been tentatively classified as Southern Cushitic. Neutral word order is SOV. The verb may be marked for first person singular subject and, in some cases for masculine and feminine second and third person singular subject. There are tonal distinctions for third singular masculine and feminine subject forms of the verb, but tone is not indicated here. Nouns have singular and plural forms, and some demonstrative elements are suffixes.

The outstanding feature of Iraqw syntax is the complicated system

*I would like to thank the speakers of Iraqw whom I consulted during my research: Mr. Sulumo, Mr. Sulle, and Mr. Harri, all from Mbulu. Helpful comments from Mr. E.D. Elderkin and Mr.
of elements called "selectors" by Whiteley [1953]. These usually appear pre-verbally (under conditions to be discussed) and may mark person, number, gender, and case of various verbal arguments, as well as such diverse features as Relative Clause Formation (REL), Passive (PSV), tense, mood, Question (Q) Formation, and others. In the examples of this paper, the selectors (SLTR's) will fall into two types: (a) those appearing after the subject but before the first object and (b) those appearing after the first object. Schematically then, the two types are:

(a) Subject - SLTR - Object - Verb
(b) Subject - Object - SLTR - Verb

Examples of the two types are given below:

(1) a. ?aniŋ ?a ?inos lohis
   lsg  SLTR,pres 3sg carry
   'I am carrying her'

   b. ?aniŋ ?inos ?a\(^2\) lohis
   lsg  3sg SLTR,fut carry
   'I will carry her'

These examples show that the word order type is relevant for the determination of Tense, since the SLTR ?a appears in both sentences. Consider these additional examples showing the function of the SLTR's (or part of a SLTR) in masculine/feminine agreement:

c. ?aniŋ ?inos ?a-na lohis
   lsg  3sg SLTR-past carry
   'I carried her'

Maghway of the University of Dar es Salaam are very gratefully acknowledged. This research was supported by a grant from the Research and Publications Committee of the Faculty of Arts and Social Sciences of the University of Dar es Salaam. I would also like to gratefully acknowledge the efforts of the late Professor I. Richardson, former head of the Department of Foreign Languages and Linguistics at the University of Dar es Salaam, in getting the Research Proposal funded. Symbols have roughly their IPA equivalents, except that \( i \) is phonetically \( i \), \( e \) is \( e \), \( o \) is \( \ddot{o} \), and \( u \) is \( \ddot{u} \).

1See Bradfield [1977] for a list of the features of the SLTR's.

2Whiteley [1953] lists ?an for the future SLTR, but I did not encounter this item in my research.
d. ʔaniŋ ḥawata ʔu lohis
   lsg man SLTR carry
   'I will carry the/a man'

e. ʔaniŋ ḥawata ʔu--na lohis
   lsg man SLTR-past carry
   'I carried the/a man'

These examples lead to the following generalizations applicable to
the pattern of SLTR agreement in this paper:

"The SLTR agrees in gender and number with the NP
immediately preceding."

It should also be pointed out that the SLTR varies with respect
to the subject as well (even when absent):

f. ḥawata ʔameni ga--na lohis
   man woman SLTR-past carry
   'the man carried the/a woman'

g. ḥawata naʕay gu--na lohis
   man child SLTR-past carry
   'the man carried the/a child'

These examples show SLTR agreement with the subject ḥawata and
with the feminine and masculine objects ḥameni and naʕay. Thus,
SLTR's agree with subjects, and will agree with objects when the
SLTR's directly precede said objects.

This paper will be primarily concerned with an investigation of
a nominal suffixal morpheme which I will call an "inaccessibility
marker" (IM). In my reading of the published accounts of Iraqw, I
can find no reference to this element, nor to its syntactic function.
Its basic shape is probably /-(C)i/ with non-high tone, 3 and the
phonetic form of the consonant is probably determined by the preceding
stem-final segment, but I am not at this time prepared to state exact
phonological details. But the impact of this element on the syntax of
the language is considerable. It will be shown that any non-subject
NP marked with the IM may not be Topicalized, Passivized, Relativized,

3This element is not to be confused with a sometimes segmentally
identical demonstrative (DEM) morpheme, also at times /-Ci/, but
with distinctly high tone.
or WH-Questioned; nor may this IM-marked NP appear in a position to govern SLTR agreement. It appears that prepositional objects and underlyingly direct objects may, under appropriate conditions, be suffixed with this element. In later sections we shall return to discuss the relevance of this for the notion of "demotion" in Relational Grammar.

2. Word-Order Permutations and the IM

The following examples illustrate the various permutations in types (a) and (b) word order, in sentences with the verbs allowing more than one object complement.

(2) a. ?aniŋ ?a barwito?o-r hanmis\textsuperscript{4} dir hawata
   lsg SLTR letter-DEM give to man
   'I am giving the letter to the/a man'

b. ?aniŋ ?a \{barwito?o-r hawat-\textsuperscript{i} \} hanmis
   lsg SLTR letter-DEM man-IM give
   \{hawat-\textsuperscript{i} barwito?o-r
   man-IM letter-DEM\}
   'I am giving the letter to the/a man'

c. ?aniŋ ?a \{barwito?o-\textsuperscript{ri} hawat-u \} hanis
   lsg SLTR letter-DEM man-DEM give
   \{hawat-u barwito?o-\textsuperscript{ri}
   man-DEM letter-DEM\}
   'I am giving the man the/a letter'

Notice that once the preposition dir is deleted, either hawat- or barwito?- must appear with the IM. Sentences without such IM's are ungrammatical. Note that either unmarked or IM-marked NP's may appear immediately before the verb in these type (a) sentences.

In the following type (b) sentences involving the future tense, the SLTR agrees with the object, but as we shall see, with only one object:

\textsuperscript{4}The element hanmis varies with hanis 'give' in that the former appears in present tense, while the latter in past and future examples. Also attested is harmis for the same item, indicating some dialectal variation.
(3) a. ʔaniŋ barwitoʔo ?a hanis dir hawata
   lsg letter SLTR give to man
   'I will give the/a letter to the/a man'

b. ʔaniŋ barwitoʔo ?a hawati-i hanis
   lsg letter SLTR man-IM give
   'I will give the/a letter to the/a man'

c. ʔaniŋ hawata ?u barwitoʔo--ri hanis
   lsg man SLTR letter-IM give
   'I will give the/a man the/a letter'

Compare the SLTR's in (3b) and (3c). In the former, the SLTR agrees with the feminine barwitoʔo, while in the latter, the SLTR is masculine in agreement with hawata. Again, sentences without IM's would be ungrammatical, as are any of the following logically possible permutations:

d. *ʔaniŋ barwitoʔo--ri ?a hawata hanis
   lsg letter-IM SLTR man give

e. *ʔaniŋ hawat--i ?u barwitoʔo hanis
   lsg man-IM SLTR letter give

f. *ʔaniŋ {hawata barwitoʔo--ri} ?a (or: ?u) hanis
   lsg {man letter-IM} SLTR (or: SLTR) give
       {barwitoʔo hawat--i
        letter man-IM

These examples illustrate that the SLTR may never agree with an IM-marked NP. Since, as has already been pointed out, SLTR agreement is always with the immediately preceding NP, it follows that an IM-marked NP may never be followed by a SLTR. SLTR agreement will always be with NP's without the IM.

Further examples involve instrumental objects:

(4) a. ʔaniŋ naʃay ?u mux ?ar hara
   lsg child SLTR beat with stick
   'I will beat the/a child with the/a stick'

b. ʔaniŋ naʃay ?u hərt-ar mux
   lsg child SLTR stick-IM, instr beat
   'I will beat the/a child with the/a stick'
c. ?aniŋ haŋa ?a naŋa--r mux
  lsg  stick  SLTR  child-IM,instr  beat
'I will beat with the/a stick the/a child'

Note that SLTR agreement is with naŋay in (4a-b), but with haŋa in (4c). Furthermore, the IM marker in these examples is phonologically similar to the instrumental preposition 'ar. It would appear that in these examples, the marker which I have labelled "IM,instr" has indeed a double function: it serves to mark the feature of instrumentality, and, as we shall see, behaves exactly like the /Ci/ IM, in that nouns marked with either of these elements will have similar accessibility restrictions.

Another prepositional expression involving the elements kitangw ... wa ale meaning 'on ... behalf of' does not show an alternation with the IM:

(5)  haŋata dasi  ga  mux  kitangw  ñameni--r  wa  ale
    man  girl  SLTR  beat  on  woman-DEM  behalf
    'the man will beat the girl on behalf of the woman'

The examples of this section show the basic word order and SLTR agreement patterns with verbs having more than one object and the effects of a promotion rule which might loosely be called a dative movement rule, but more properly should be labelled a non-direct-object movement rule. A wider range of word-order permutations are possible in the type (a) word order examples (cf. (2a-3)) than in type (b) examples (cf. above), but this is due to the fact that type (b) structures involve SLTR agreement with objects, while type (a) never does. Type (b) examples, or sentences presumed to be derived from type (b) structures with SLTR agreement for underlying or derived objects, will be the focus of the remainder of this paper.

3. Inaccessibility Marker and Syntactic Rules

In the following examples, it will be useful to distinguish among a number of types of objects, as these are victims of various rules. The objects examined here will be semantic direct, indirect (benefactive or dative) and instrumental, as well as the prepositional
'on X's behalf' structure seen above in (5). We will attempt to have these objects become victims of the rules of PSV, TOP, WH-Q, and REL.

3.1. One-object verbs. We shall begin by using simple transitive verbs, i.e. verbs with only one object. Consider the following:

(6) a. hawata kuna mux ne baba
    man PSV,SLTR beat by father
    'the man was beaten by father'

    b. dasi kana mux ne baba
    girl PSV,SLTR beat by father
    'the girl was beaten by father'

(7) a. na\ay, hawata gu mux
    child man SLTR beat
    'the child, the man will beat'

    b. dasi, hawata ga mux
    girl man SLTR beat
    'the girl, the man will beat'

    lsg letter-DEM [2sg REL,SLTR write] SLTR hold
    'I held the letter which you wrote'

(9) a. hawata gar ?a mux
    man WH SLTR beat
    'what did the man beat?'

    b. hawata hee ?a mux
    man WH SLTR beat
    'whom did the man beat?'

In examples (6-7), the SLTR's agree with the fronted noun. In (8-9), the SLTR's are invariable for these objects. The examples have been kept simple for the purposes of the discussion, but it should be pointed out that there are numerous additional complications which are beyond the scope of this paper and hence not mentioned. These do not, however, affect the point of the discussion.

3.2. More-than-one object verbs. We are now in a position to examine
more complicated examples with verbs taking more than one object. We shall be particularly interested in the behavior of those nouns suffixed with the IM in the examples below.

3.2.1. Passives. Let us first examine some PSV examples. For the underlying constructions of SUBJ-OBJ-DATIVE/BENEFACTIVE-VERB, we find that the OBJ, the Dative, or the Benefactive may be passivized:

(10) a. muru’aima kuna dasi--ri hanis ne ʕameni
    food PSV, SLTR girl-IM give by woman
    'food was given to the/a girl by the/a woman'

    b. dasi kana muru’aima---ri hanis ne ʕameni
    girl PSV, SLTR food-IM give by woman
    'the/a girl was given food by the/a woman'

(11) a. muru’aima kuna dasi--ri huurin ne ʕameni
    food PSV, SLTR girl-IM cook by woman
    'food was cooked for the/a girl by the/a woman'

    b. dasi kana muru’aima---ri huurin ne ʕameni
    girl PSV, SLTR food--IM cook by woman
    'the/a girl was cooked food for by the/a woman'

However, if we attempt to passivize the object NP's with IM's, the sentences are ungrammatical. Consider the presumably related (10-11c) examples below:

(10) c. *dasi-ri kana muru’aima(---ri) hanis ne ʕameni
    girl-IM PSV, SLTR food(---IM) give by woman
    *muru’aima--ri kuna dasi(---ri) hanis ne ʕameni
    food--IM PSV, SLTR girl(-IM) give by woman

(11) c. *dasi-ri kana muru’aima(---ri) huurin ne ʕameni
    girl-IM PSV, SLTR food(--IM) cook by woman
    *muru’aima--ri kuna dasi(--ri) huurin ne ʕameni
    food--IM PSV, SLTR girl(--IM) cook by woman

The parenthesized IM's are included in the above examples to show that

5 Future researchers checking these data should be very careful to distinguish the IM morphemes from the Demonstratives mentioned in footnote 3.
ungrammaticality results whether or not the second NP is IM-marked.

Passivizing an instrumental object or the direct object is possible:

(12) a.  hara  kana  naïa--r  mux  ne  ōameni
       stick  PSV,SLTR  child-IM  beat  by  woman
       'the stick was used to beat the child by the woman'

b.  naïay  kuna  hara--r  mux  ne  ōameni
       child  PSV,SLTR  stick-IM  beat  by  woman
       'the child was beaten with a stick by a woman'

But again, if we were to attempt to passivize either object NP marked with the IM, the sentences are ungrammatical:

(12) c.  *harar--r  kana  naïay(/--r)  mux  ne  ōameni
       stick-IM  PSV,SLTR  child(--IM)  beat  by  woman

*naïa--r  kuna  hara(/--r)  mux  ne  ōameni
       child-IM  PSV,SLTR  stick(--IM)  beat  by  woman

In all of the preceding examples, SLTR agreement with particular derived subject NP's is correct, and cannot be the cause of ungrammaticality when it occurs. Clearly, then the presence of the IM's in (10c, 11c, 12c) is the crucial factor.

It appears that prepositional objects may not be directly passivized. Thus, from a structure like the following, the prepositional object is moved, but the result is ungrammatical:

(13) /Ōameni  (SUBJ)--muruïaima  (OBJ)--  hanis  (V)  dir  (PREP)  dasi  /woman  food  give  to  girl
    -->  *dasi  kana  muruïaima(/--ri)  hanis  dir  ----os  ne  ōameni
          girl  PSV,SLTR  food(--IM)  give  to(--3sgPRO)  by  woman

Iraqw does not allow preposition-stranding, which could be the cause of the ungrammaticality. To allow for this, a pronominal suffix -os is added to the preposition dir in parentheses, but the result was unanimously judged as extremely clumsy. We conclude then that passivization may not apply to prepositional objects, unless these objects are promoted to some other (as yet undefined) status prior to PSV.
To summarize, direct and indirect objects and instrumental objects may be passivized, but prepositional objects and IM-marked objects may not.

3.2.2. Topicalization. The rule of TOP is another rule which is sensitive to the presence of an IM on the victim object NP's. This rule can move all objects except those marked with IM's:

(14) a. nafay, tameni guna barwito?o-ri hanis
    child woman SLTR letter-IM give
    'the child, the/a woman gave the/a letter to'

    b. nafay, tameni barwito?o gana hanis dir---os
    child woman letter SLTR give to-3sgPRO
    'the child, the/a woman gave the/a letter to her'

    c. barwito?o, tameni gana ?inos--i6 hanis
    letter woman SLTR 3sgPRO-IM give
    'the letter, the/a woman gave to him'

(15) a. kun, tameni ?una muru?aima--ri huurin
    2sg,M woman SLTR food-IM cook
    'you, the/a woman cooked food for'

    b. muru?aima, tameni ?ina kun-gi huurin
    food woman SLTR 2sgM--IM cook
    'food, the/a woman cooked for you'

(16) a. nafay, ?ani? ?u hara-r mux
    child lsg SLTR stick-IM beat
    'the child, I will beat with the/a stick'

    b. hara, ?ani? ?a naf-a--r mux
    stick lsg SLTR child-IM beat
    'the stick, I will beat the/a child with'

(17) a. dasi, hawata ga mux kitaŋ tameni wa ale
    girl man SLTR beat behalf woman behalf of
    'the girl, the/a man will beat on behalf of the/a woman'

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6The IM-suffixed form for 'child' is in fact naf-a-y, which is too similar to the non-IM-suffixed form to be an effective example. Therefore I have substituted the IM-marked form for 'him', ?inos--i, which very clearly alternates with the non-suffixed form ?inos.
(17) b. ůameni, hawata dasi ga mux kitaŋ--os wa ale
woman man girl SLTR beat behalf-3sgPRO behalf of
'the woman, the/a man will beat the/a girl on behalf of her'

If in examples (14-17) an IM were to appear on the topicalized NP, the sentences would be ungrammatical. Thus, it appears that all types of objects may be topicalized, but no objects with the IM may undergo this rule.

3.2.3. Relativization. Relativization, too, is sensitive to the appearance of IM's on objects. Object NP's may be relativized as in the following:

(18) a. ?aniŋ ůameni--r na muruʕaima-ri hanis ?ana ?oh
lsg woman-DEM REL,SLTR food-IM give SLTR hold
'I held the woman whom I gave food to'

b. ?aniŋ muruʕaima--r na ůameni---ri hanis ?una ?oh
lsg food--DEM REL,SLTR woman-IM give SLTR hold
'I held the food which I gave to the/a woman'

(19) a. ?aniŋ hara ůameni ?a garm--a mux
lsg stick woman SLTR boy-IM beat SLTR hold
'I held the stick which the/a woman will beat the/a boy with'

b. ?aniŋ garm--o ůameni ?i hara--r mux
lsg boy-DEM woman SLTR stick--IM beat SLTR hold
'I held the boy whom the/a woman will beat with the/a stick'

(20) ?aniŋ ůameni--r hawata dasi ga mux kitaŋ--os wa ale
lsg woman-DEM man girl SLTR beat behalf-3sgPRO behalf of
?ana ?oh
SLTR hold
'I held the woman on whose behalf the/a man will beat the/a girl'

But once again, if we were to attempt to relativize an object NP which was marked with the IM, the results would be ungrammatical. Thus, Relativization is sensitive to whether or not object NP's are suffixed by the IM.

3.2.4. WH-questions. A fourth rule which is sensitive to the presence
of IM's is WH-Q Formation. All objects can be questioned as in the following:

(21) a. ?anîŋ gar na õawat---i hanis
   lsg WH SLTR man-IM give
   'what did I give to the/a man?'

b. ?anîŋ hee na muruʃaima--ri hanis
   lsg WH SLTR food-IM give
   'whom did I give food to?'

(22) a. ?anîŋ gar na garma---r mux
   lsg WH SLTR boy--1M beat
   'what did I beat the/a boy with?'

b. ?anîŋ hee na hara---r mux
   lsg WH SLTR stick--1M beat
   'whom did I beat with the/a stick?'

(23) õawata dasi ga mux kîtaŋ hee
    man girl SLTR beat behalf WH
    'the/a man will beat the/a girl on behalf of whom?'

But if we attempt to question an object NP with an IM, the results are ungrammatical. One example is given, similar to (21a-b):

(21) c. *?anîŋ gar(---i) na õawata hanis
    lsg WH(--IM) SLTR man give

d. *?anîŋ hee(---i) na muruʃaima hanis
    lsg WH(--IM) SLTR food give

3.2.5. Summary. By now the point is clear that most objects are accessible to the rules of PSV, TOP, REL, and WH-Q, whereas object NP's of any underlying relation surfacing with the IM marker must not be victims of these rules.

4. Discussion

The various types of object seem to divide themselves into

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7WH-Q Formation also involves a relativization strategy like the following: thing/person REL SUBJ (OBJ) VERB is WH. Since this essentially duplicates the REL data, it is not included here.
several groups in Iraqw in terms of morphology and syntactic behavior. The first group, let us call them Unmarked Objects, may in type (b) structures appear directly after the subject, govern SLTR agreement (cf. sentences (3-4)), and may be victims of the syntactic rules of PSV, TOP, REL, and Wh-Q.

A second group would be Prepositional Object NP's. These may not appear directly after the subject, do not trigger SLTR agreement, and may appear after the verb. These elements may be victims of all of the syntactic rules described above except PSV.

The third group of objects are those marked with IM's. Recall that we are restricting our discussion to type (b) structures. IM-marked Objects may not appear directly after the subject, do not and must not trigger SLTR agreement, and may not be victims of any of the syntactic rules discussed above.

Thus, we have a sliding scale of object types, which we may summarize as in the following table:

<table>
<thead>
<tr>
<th></th>
<th>after subject</th>
<th>SLTR agreement</th>
<th>victim of</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmarked</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Prepositional</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>IM-Suffixed</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

I would now like to discuss an analysis of this data with an approach based on Relational Grammar. It has long been noted that relational (syntactic) promotion, accessibility to syntactic rules, and focus are inter-related features, and the correlation has been reasonably well established. What is being proposed here for Iraqw is that there is a particular morpheme, the IM suffix, which is transformationally attached to those object NP's which have been relationally demoted. Coupled with relational demotion is syntactic inaccessibility for that relation,

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8Cf. Dalgish [1976] and Dalgish and Sheintuch [1977] for a discussion of transformational verbal marking when Locative Objects have gone "up" the Relational Hierarchy.
and a corresponding inability to focus on that item. Within our hierarchy of Object types, Unmarked Objects are at the top of the scale, IM-marked Objects at the bottom, and Prepositional Objects somewhere in between.

Let us consider some concrete examples within this Relational-Demotional approach. Assuming that alternations of object types as in (3a-c) and (4a-c) are related, we can characterize these relations in terms of Relational promotion and demotion. Consider examples in which certain Prepositional Objects (those with dir and ‘ar as the prepositions) may become Unmarked Objects:

(3) a. ?anĩŋ barwitoʔo ʔa hanis dir hawata
    lsg letter SLTR give to man
    'I will give the/a letter to the/a man'

(3) c. ?anĩŋ hawata ʔu barwitoʔo--ri hanis
    lsg man SLTR letter--IM give
    'I will give the/a man the/a letter'

In (3c), the Unmarked Object hawata, derived from the Prepositional Object dir hawata in (3a), has been promoted and appears after the subject, governs SLTR agreement, and may be the victim of PSV,TOP,REL, and WH-Q. These are properties that as a Prepositional Object it did not possess. The promotion of the Prepositional Object to Unmarked Object status will result in the demotion by usurpation of the previous Unmarked Object, in these cases, barwitoʔo, which then becomes transformationally suffixed by the IM. As a demoted NP, it is less accessible to syntactic rules and consequently "out of focus".

A case in which only demotion takes place is illustrated by the following sentences:

(3) a. ?anĩŋ barwitoʔo ʔa hanis dir hawata
    lsg letter SLTR give to man
    'I will give the/a letter to the/a man'

(3) b. ?anĩŋ barwitoʔo ʔa hawat---i hanis
    lsg letter SLTR man--IM give
    'I will give the/a letter to the/a man'
In (3a), the Prepositional Object \textit{hawata} may be Topicalized, Relativized, WH-Questioned, but may not be Passivized or trigger SLTR agreement. But if \textit{hawata} is moved to the left of the verb, it loses its Prepositional Object status, and may not be the victim of any of these syntactic processes. The IM-morpheme, it is claimed, signals this Relational demotion. Examples like these show that it is possible for Relational demotion to take place without necessarily involving usurpation in promotion processes (cf. Dalgish [1977] for evidence from Dho-Luo indicating essentially similar findings).

To summarize, then, the relational demotion undergone by either the (underlyingly) Unmarked Object or the Prepositional Object NP is signalled by the appearance of the IM morpheme. This analysis can easily be extended to other examples in this paper. This Relational account of the syntax of object NP's in Iraqw allows us to state quite simply the conditions under which object NP's are suffixed by the IM morpheme, namely, whenever an object undergoes a Relational demotion. We may view the restricted syntactic behavior (inaccessibility) of such suffixed NP's as a consequence of this demotion.

REFERENCES


The following papers were presented in the Working Group on Tone at the Eighth Conference on African Linguistics.
1. Introduction

The purpose of this paper is to show an area of grammar that the existing model of generative grammar cannot account for without recourse to complicated ad hoc rules. The surface phonetic form of the tones is unpredictable, and furthermore an adequate representation of the underlying structure of these tones seems difficult to find. The unpredictability of the output structure is due to the ambivalent nature of tone, which in Kinyarwanda and in other Bantu languages as well, can be (a) a feature on the syllable as well as (b) a syntactic morpheme.

To illustrate this, I will limit the analysis to the verb morphology. Kinyarwanda, like other Bantu languages, is agglutinative. For instance, tense markers, subject pronouns (agreement), object pronouns (clitics), case markers (benefactive, instrumental, locative...), voice (passive, middle), and aspect are morphemes affixed to the verb as illustrated in (1):

1) Baarab’kubitirgwaga < ba1-aara-bi-kubit-ir2- w-aga
   'They used to be beaten for that.' they-past-it-beat -ben-pass-asp

This language has two phonological tones, high (H) and low (L). Vowels are either short (V) or long (VV). Phonetically, short vowels appear as either H (\(\hat{v}\)), L (\(\check{v}\)) or F (=falling)(\(\check{v}\)). Long vowels surface as either LL (VV); HH (\(\hat{\hat{v}}\); LH (\(\hat{\check{v}}\); HL (\(\check{\hat{v}}\) or LF (VV). Low tone will not be marked again in this paper. For a detailed discussion, see Kimenyi [1976]. In the penultimate position of the infinitival form, the sequence HH is not attested because of the existence of a tone anticipation rule in this lan-

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*I have received valuable comments on the early version of this paper from Baruch Elimelech and Larry Hyman.

1 The vowel a is always deleted if it precedes a morpheme beginning with another vowel.

2 A consonant is always inserted between a consonant and a glide: the epenthetic consonant takes the articulatory features of the glide and agrees in voicing, nasality and spirantization with the preceding consonant (for detail, see Kimenyi [1977a]).
guage. The final vowel -a, which comes after the verb stem, always carries L tone. The F tone is underlingly H, and all Hs derive from the next syllable on the right. A F does not surface on the onset of a long vowel, nor in word-initial position. Anticipation is blocked if the H is on the coda of a long vowel. These rules are formalized in (2) and illustrated in (3):

2) a. \( \hat{\nu} \rightarrow \hat{\nu} \)
   condition: \( \hat{\nu} \) is not \( \hat{\nu} \)
   b. \( \hat{\nu} \rightarrow \hat{\nu}/CV \)
       condition: \( \hat{\nu} \)

3) /umu + gabo/ umugabo 'man'
    /iki + gega/ ikigega 'storehouse'
    /umu + gore/ umugôrê 'woman, wife'
    /aka + masu/ akamâfû 'trap'
    /ú + no/ únô 'this one'
    /bá + no/ bâno 'these ones'
    /umu + ãana/ ūmŋåana2 'child'
    /uku + ëesi/ ūkwëesi 'moon, month'
    /umu + éendå/ ūmŋëenda 'debt'
    /iki + áápå/ ëkâápa1 'traffic signal'
    /umu + ãámi/ ūmŋâámi2 'king'
    /umu + éëne/ ūmŋëëne2 'hole'

In the remainder of the paper we will see instances in which the rules given in (2) apply. But in many more cases, it will be shown that the phonetic tones of the verb forms are not predictable, since the underlying tones of the same morpheme seem to differ in some tenses. To make the presentation clear and convincing, I will give examples of monosyllabic verbs since in this language each infinitival verb form can have only one lexical high tone, no matter how many syllables it happens to have—the choice of monosyllabic examples does not mitigate the force of our argument. Since vowel length is contrastive, the monosyllabic verbs under investigation are either of the shape -CVC- or -CVVC-. Therefore we may expect two types of tones to occur in each: -CVC- stems will appear as either -CVC- or -CVC-, whereas the phonological tone of -CVVC- is -CVVC- or -CVVC-. The verb -kôr- 'work, do', will be used for the -CVC- stem, -kin- 'play' for -CVC-, -kund- 'like, love' for -CVVC- and -geend- 'go, leave' for -CVVC-.

As indicated in (1), the finite verb has as obligatory morphemes the subject agreement, the tense and the aspect markers. Optional morphemes that appear on the finite verb are (i) ni- and the negative marker for independent clauses, nti-; (ii) the negative marker for subordinate clauses -ta-, which comes after the subject agreement; (iii) the object clitics, of which there can be a maximum of four, appearing between the tense marker and the verb stem; (iv) the morpheme -na- 'also', which appears between the tense marker and the object clitics; (v) the extensions which come after the verb stem; and (vi) the locative suffixes, just after the aspect marker. The order of these morphemes is given below:

4) \( (\{\text{neg}_1\})-\text{Subj.}-\{\text{neg}_2\}-\text{Tense-}(\text{na})-(\text{Obj.})-\text{Verb-}(\text{subj.})-\text{asp-}(\text{loc.}) \)

\( \text{Agr.} \quad \text{Cl. Stem} \)
Neg and neg are exclusive. The aspect markers are -a(ga) imperfective, and -(v)ye perfecitive. The locative morphemes are -mô and -hô. The morphemes that appear in the tense slot are the following:

5) -ra- present/near future -raka- hortative
-zaa- future -ooka- hortative
-aa₁- near past -aa₂- conditional₁
-aara- remote past -ii- negative imperative
-rakYaa- still -ø₁- habitual
-ka- narrative/consecutive -ø₂- participial
-aa₃- conditional₂

2. Tone Realization of Simple Tenses

In Table 1, the uses of these tenses with the four types of verbs are illustrated. Only one subject agreement marker, ba-, will be used in the paper for clarity of exposition. On the right are given the phonetic realizations.

These tenses will be grouped into different classes because of the effect they produce on the underlying tones of the verb stems. The tenses that keep the lexical tones of the verb and let the tone rules given in (2) apply, such as the -ra-, -aa-, -ka-, and -rakYaa- tenses, will be called the lexical tone keeping tenses; the others will be labelled the lexical tone neutralizing tenses because they seem to give the same tone to all verbs, regardless of their underlying tones.

Group two tenses are in turn subclassified into 4 categories: (i) tenses that lower the verb stem tone (e.g. -zaa-, -raka-, and -ø-, the future, hortative and habitual formatives); (ii) tenses that lower the stem tone but put a H on the syllable preceding it (e.g. -ø- and -ooka-, the participial and hortative markers); (iii) tenses that put a H on the stem, namely remote past -aara-; and finally (iv) the tenses that put H on the last syllable of the finite verb: -aa- and -ii-, from the if clause of conditionals and negative imperatives respectively.

The imperative tones are classified in group 2(i) also, because they lower the whole verb:

6) Imperative    Verb Stem    asp    Phonetic realization    Gloss
-kór-    -a    kora    'work'
-kîn-    -a    kina    'play'
-kúund-    -a    kuunda    'like'
-geend-    -a    geenda    'go'

The infinitive is classified among the lexical tone keeping morphemes:
Table 1. Tone realization of simple tenses

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
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</table>
| a. ba-ra -work-a | H barákôra | f. ba-zaa⁴ -work-a | H bazaakora | H barákôra | H bazaakora | H bazaakor
|   | L barakina | -play- | H barákûnza | -play- | L bazaakina | -like- |
|   | HL barákûnza | -like- | LL bazaakûnda | -like- | HL bazaakûnda | -imperf. |
| b. ba-aa₁ -work-ye | H baákôze | g. ba-raka³ -work-a | H baragakora | H baragakora | H baákûnda | H baukunda |
|   | L baakinpe | -play- | L baragakina | -play- | LL baukunda | -like- |
|   | HL baákûnza | -like- | HL baragakuunda | -like- | LL baragakuunda | -imperf. |
| c. ba-ka³,⁴ -work-a | H bagákôra | h. ba-ø₁ -work-a | H bakora | H bakora | H bakora | H baukunda |
|   | L bagakina | -play- | L bakina | -play- | LL baukunda | -like- |
|   | HL bagákûnda | -like- | HL baukunda | -like- | LL baukunda | -imperf. |
|   | LL bakageenda | they-habit. -go -imperf. | LL bageenda | they-partic.-go -imperf. | LL bageenda | they-partic.-go -imperf. |
| d. ba-rak'ya -work-a | H barák'yaákôra | i. ba-ø₂ -work-a | H bâkora | H bâkora | H bâkora | H bâkunda |
|   | L barák'yaakina | -play- | L bâkina | -play- | LL bâkunda | -like- |
|   | HL barák'yaakûnza | -like- | HL baukunda | -like- | LL baukunda | -imperf. |
|   | LL barák'yaageenda | they-partic.-go -imperf. | LL bageenda | they-partic.-go -imperf. | LL bageenda | they-partic.-go -imperf. |
| e. ba-aa² -work-a | H baákôra | j. ba-ooka³ -work-a | H boogâkora | H boogâkora | H boogâkora | H boogâkuunda |
|   | L baakina | -play- | L boogâkina | -play- | LL boogâkuunda | -like- |
|   | HL baákûnda | -like- | HL boogâkuunda | -like- | LL boogâkuunda | -imperf. |
|   | LL baageenda | they-partic.-go -imperf. | LL boogâgeenda | they-partic.-go -imperf. | LL boogâgeenda | they-partic.-go -imperf. |

³The morphemes /ku-, -raka-, -ka-, -ki-, -ta-/ are voiced if they occur before a stem with a voiceless initial consonant (Dahl's law). For detailed discussion on this, see Kimenyi [1976b].

⁴The future -zaa- tense can also be combined with the consecutive -ka- tense, or the conditional -aa-, as shown below:

a. ba-zaa₄ -work-a | H bazaakora | H bazaakora | H bazaakora
|   | L bazaakina | work | L bazaakina | work
|   | HL bazaakûnda | play | HL bazaakûnda | play
|   | LL bazaageenda | like | LL bazaageenda | like

'and then they will{'play'}' | 'if they will {'play'}'
|   | geenda | go | baazaageenda | go
Table 1. Tone realization of simple tenses, cont.

<table>
<thead>
<tr>
<th></th>
<th>Tone</th>
<th>Glosses:</th>
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</thead>
<tbody>
<tr>
<td>k</td>
<td>ba-aa -work-ye</td>
<td>H baárakóže</td>
</tr>
<tr>
<td></td>
<td>-play-</td>
<td>L baârakînne</td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>HL baârakuúnde</td>
</tr>
<tr>
<td></td>
<td>they-rem.past-go -perfect</td>
<td>LL baârágéené</td>
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<tr>
<td>m</td>
<td>ba-ii -work-a</td>
<td>H biikôrá</td>
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<td></td>
<td>-play-</td>
<td>L biikînâ</td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>HL biikuúndâ</td>
</tr>
<tr>
<td></td>
<td>they-neg.imp.-go -imperf.</td>
<td>LL biigeëndâ</td>
</tr>
<tr>
<td>l</td>
<td>ba-aa -work-a</td>
<td>H baâkórá</td>
</tr>
<tr>
<td></td>
<td>-play-</td>
<td>L baâkînâ</td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>HL baâkuúndâ</td>
</tr>
<tr>
<td></td>
<td>they-conditional -go -imperf.</td>
<td>LL baâgeëndâ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Glosses:</td>
</tr>
<tr>
<td>a</td>
<td>'they V'</td>
<td>b. 'they V-ed'</td>
</tr>
<tr>
<td></td>
<td>d. 'did they V?'</td>
<td>e. 'they would V'</td>
</tr>
<tr>
<td>b</td>
<td>'do they V?'</td>
<td>f. 'they will V'</td>
</tr>
<tr>
<td>c</td>
<td>'will they V?'</td>
<td>g. 'may they V'</td>
</tr>
<tr>
<td>d</td>
<td>'and then they V-ed'</td>
<td>h. 'they V habitually'</td>
</tr>
<tr>
<td>e</td>
<td>'they are still V-ing'</td>
<td>i. 'them V-ing'</td>
</tr>
<tr>
<td>f</td>
<td>'they should V'</td>
<td>j. 'may they V'</td>
</tr>
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Table 2. Doubt

<table>
<thead>
<tr>
<th></th>
<th>Tone</th>
<th>Glosses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>- ba-aa -work-a</td>
<td>bákora</td>
</tr>
<tr>
<td></td>
<td>-play-</td>
<td>bâkînâ</td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>bâkuunda</td>
</tr>
<tr>
<td></td>
<td>doubt-the-present-go -imperf.</td>
<td>bâgoëenda</td>
</tr>
<tr>
<td>b</td>
<td>- ba-ø1 -work-a</td>
<td>bákora</td>
</tr>
<tr>
<td></td>
<td>-play-</td>
<td>bâkînâ</td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>bâkuunda</td>
</tr>
<tr>
<td></td>
<td>doubt-the-habitual -go -imperf.</td>
<td>bâgoëenda</td>
</tr>
<tr>
<td>c</td>
<td>- ba-zaa -work-a</td>
<td>bâzaaka -kóra</td>
</tr>
<tr>
<td></td>
<td>-play-</td>
<td>bâzaakînne</td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>bâzaakuúndà</td>
</tr>
<tr>
<td></td>
<td>doubt-the-future -go -imperf.</td>
<td>bâzaageëndâ</td>
</tr>
</tbody>
</table>

Glosses:

a. 'are they V-ing?'    d. 'did they V?'
b. 'do they V?'          e. 'did they V?'
c. 'will they V?'

6There is another way to express this, namely:

bâzaâ{kóra } 'will they {work}'  bâzaâ{kînna } 'will they {play}'

bâzaâ{kúnda } 'will they {like}'  bâzaâ{geenda } 'will they {go}'
How can we account for the tone rules of these tenses in a unified way? The best way to do this is to posit two types of tones, $T_1$ and $T_2$. $T_1$ is the feature on the syllable or the lexical tone, whereas $T_2$ is the morphological tone. As has been observed elsewhere [Kimenyi 1976], lexical tones are characterized by a binary feature, $\pm \text{High}$, since L tones don't play any role in the tone rule formulation of lexical tones. Note, however, that in the case of morphological tones, low tones are very significant. For this reason, morphological tones, $T_2$, will be classified into two types of tones, $\alpha T_2$ and $\beta T_2$. $\alpha T_2$ tones are the ones that are toneless and therefore let the tone anticipation rule apply if its structural description is met. $\beta T_2$ tones are those morphological tones that neutralize the lexical tones. $\alpha T_2$ are thus equivalent to lexical L tones, since they allow the tone anticipation rule to apply. $\beta T_2$ tones are also realized as either L or H. In order to distinguish them from lexical tones, they will be marked by a prime marker ($'$).

Since a lexical H tone is neutralized before a $\beta T_2$ tone whether it is L or H', and since as will be shown, the tone anticipation applies among $\beta T_2$ tones, we can propose the following tone hierarchy (TH):

$$\text{TH: } \{ L \} < H < \{ L', H' \}$$

where the sign $<$ means greater than or takes precedence.

The tone anticipation rule has to be reformulated as follows:

$$\text{a. } \{ L_{\alpha T_2} \} \rightarrow H/\{ H_{\alpha T_2} \} \quad \text{b. } H \rightarrow L/\{ L_{\alpha T_2} \}$$

In other words, the tone anticipation applies the way it was formulated in (2) if the morphological tone before a lexical H is toneless. The lexical tones are lowered before or after morphological tones, L or H'. The rules given in (10) are indeed responsible for the 4 types of tone realization observed in Table 1. The -ra-, -rakyaa-, -ka-, and the -aa- forms are derived by rule 10a. The f, g and h tenses in Table 1 are derived by R.10b, in which case these tenses are supposed to have in the underlying representation a L. The remaining 3 types of tone realization in Table 1—types i–j, k, and l–m—are derived by both R.10a and R.10b. Lexical tone in i–j is neutralized after the H morphological tone. Participial tone can be reconstructed as H in the syllable preceding the verb stem and the underlying representation of the hortative is -ooka-. The remote past is represented by -aa- plus a H on the verb stem. In the case of the l and m forms, the H is on the last syllable but realized on the stem per R10a and R10b.
3. **Complex tenses.**

The tenses given in (5) can be combined with some other tense morphemes such as subjunctive, doubt mood, conditional, relative and negative, and thus result in more complex tenses. It is precisely in these instances that it will be illustrated that their tonal output structure is not derived but memorized, since there doesn't seem to be any general way their surface forms can be accounted for in the present generative framework. Tenses that appear in the subjunctive are given first, then come doubt tenses, relative and conditional tenses. The section concludes with negatives.

3.1 **Subjunctive.** Only three tenses, present, near future and distant future, (-ra-5, -ra-, -zaa-) can appear in this mood.

11) a. **ba-ra**⁵ **-work-e** | **H** bakóře | 'they should V'
   **they-present-play-subj.** | **L** bakíné
   **-like-** | **HL** bakuúndé
   **-go -** | **LL** bageénde

b. **-ra** **-work-e** | **H** barakora | 'they should V'
   **-nr.fut.-play-subj.** | **L** barakine
   **-like-** | **HL** barakuunde
   **-go -** | **LL** barageende

c. **-zaa** **-work-e** | **H** bázákóře | 'they should V'
   **-rm.fut.-play-subj.** | **L** bázákíné
   **-like-** | **HL** bázákuúndé
   **-go -** | **LL** bázáageénde

How can we derive the tones in the tenses above? If we posit the subjunctive tone as a final H, we will get the phonetic realization by applying the tone neutralization rule in (10) and the tone anticipation rule in (2). Note, however, that this rule, even if it gives the right result for (11b), is not general, since the data in (11b) and (11c) are not obviously derived by these rules. Each tense seems to have its own subjunctive tone, thus the near future (11b) would have a final L in order to get the right results. The distant future would have two Hs, namely the final H and the H on the tense marker. Clearly, some generalization is being missed here.

3.2 **Doubt.** As the name indicates, doubt mood is used to show uncertainty. The tenses that appear in this mood are present, habitual, future, and both recent and remote pasts (-ra-⁵, ø, -zaa-, -aa-, -aara-). Since this mood is solely indicated by tone, it will be placed before the subject agreement. Table 2, which follows Table 1, p. , shows the Doubt mood forms.

Note that in all these cases, the morpheme -ra- is deleted: but this shows that positing such underlying representation is already the incorrect approach.
The underlying doubt tone can be posited as \( \text{H} \) on the first vowel of the finite verb. The rules that we have formulated earlier give us the right phonetic output for at least the first three tenses. The lexical tones are neutralized as predicted by rule (10) and the doubt tone falls, as dictated by rule (2a). The neutralization rule doesn't apply to the recent past (Table 2, form d), however, since the lexical tones are retained. Note also that in the remote past (form e) an extra \( \text{H} \) is added on the verb stem. It is clear that the phonetic output of many tenses cannot be predicted all the time.

3.3 **Relative.** Verbs in relative clauses are marked by a \( \text{H} \). The same tone is shared by verbs in "that" clauses. Tenses that appear in relative clauses are: present, habitual, future, recent and remote pasts, conditional and "still" (-ra-, -\( \emptyset \)-, -zaa-, -aa-\( _1 \), -aa-\( _2 \), -ara-, -aa-', -rak'aa-). These forms are tabulated in Table 3.

In the the a, b, d, f & g forms, the relative morpheme is a \( \text{H} \) marked on the last syllable of the finite verb. The phonetic tones in these tenses are derived by the rules that we have posited. Note, however, that the relative marker in the future and remote past is marked differently. In the future tense, this tone is marked on the onset of the tense marker. We observe also that in this instance, the lexical tones are not neutralized. In the remote past, the relative tone is marked on the coda of the tense marker. This is a problem for a theory that would posit the same underlying tone to all relative tenses.

3.4 **Realis conditional.** This mood is marked by the morpheme ni- (probably from the copula \( \text{n} \)) which, like the negative marker nti-, precedes subject agreement. It is used in two tenses, present and future (-ra-, -zaa-).

12) a. ni- ba-ra\( ^5 \) -work-a \( \text{H} \) n\( \text{ibakr} \) ‘if they V’
   -play- \( \text{L} \) n\( \text{ibak} \) ‘n\( \text{u} \) ‘nd\( \text{a} \) ‘
   -like- \( \text{HL} \) n\( \text{ibaku} \) ‘nd\( \text{a} \) ‘
   rc-3pp-present-go -imp. \( \text{LL} \) n\( \text{ibage} \) ‘nd\( \text{a} \) ‘

   b. ni- ba-zaa -work-a \( \text{H} \) n\( \text{ibazacja} \) ‘kora’ ‘if they will V’
   -play- \( \text{L} \) n\( \text{ibazacja} \) ‘kina’
   -like- \( \text{HL} \) n\( \text{ibazacja} \) ‘kunda’
   rc-3pp-future -go -imp. \( \text{LL} \) n\( \text{ibazacja} \) ‘geenda’

As we can see, this mood neutralizes the lexical tones and bears different tones in the two tenses. In the a form, the first and last syllables of the verb have a \( \text{H} \); whereas in the b form, the morphological tone is marked as a \( \text{H} \) on the tense morpheme. In the latter tense, tone neutralization doesn't take place as in the former.

3.5 **Tenses that take the negative nti-**. In the independent clause the negative morpheme is nti-. In Table 4 we find the allowable tenses after this negator: present, recent and remote pasts, future, conditional:then
clause, consecutive, subjunctive and "not yet" forms (-ra-, -aa-1,-aara-, -zaa-, -aa-2,3, -ka-, -e, -raa-).

As we can see, the negative tone is marked differently depending on the tense. In some tenses, it is marked by a complete lowering of the finite verb, as in the Table 5 a & g forms. In the present, the negative tone is marked as H on the last syllable of the verb. In the future, i, it is marked by a H on the tense marker. The same tone is marked on the "not yet", or j form. Notice that in both i and j the tense markers behave like toneless morphemes (aT2) since tone neutralization does not take place, the lexical tones remain and the tone anticipation rule is not blocked. In the h form, negation is tonally marked on the H subject agreement. In g, negation is realized as H on the negating morpheme. In the remote past, e, negation is tonally marked on the coda of the tense marker. Obviously, the same negative morpheme cannot be posited for all tenses.

3.6 Tenses that take the -ta- negator. As mentioned earlier, the negator -ta- is used in subordinate clauses: doubt mood, "that" clauses, relative clauses, conditionals, participials, gerunds and relatives. We see these forms displayed in Table 5.

The gerund is always preceded by the copula -ri. It takes the noun class marker bu-(14). It ends with the subjunctive marker -e and has future reference. Gerunds and infinitives negated are demonstrated in Table 6.

In many tenses, the negative marker can be reconstructed as a toneless morpheme, since the verbs that have it are identical to their positive counterparts. Compare the conditional forms in Table 1, 1 , with Table 5 b and d/7. Note that in Table 6, the main verb in the gerundive also has the same tone pattern; other, non-conditional, forms in Table 5 with this tone pattern are: d/1,2, and 4. The affirmative gerund is part of this pattern: bukôrê, bukônê, bukuündê, bugeéndê. In Table 5 a and c/l, negation is marked on the last syllable of the verb stem. We note also that the tones of the tense marker also appear in 5 a and c/l—compare Table 1, i, and Table 2, a. In d/6 of Table 5, the negative marker produces a lowering on the verb. If the negative infinitive's tones are derived by the tone neutralization rule, the anticipation and the falling rules, then the underlying tones would be three Hs, one on the aspect marker, another on the verb stem and the third on the negator.

4. Conclusion

This paper has shown that in order to capture what is going on in the tones of the simple tenses, one has to recognize the following:

1. Some grammatical tones are considered toneless, which means that phonologically, they behave like lexical Ls and thus allow application of the tone anticipation rule.
ii. Lexical tones are neutralized before grammatical tones so that a high tone verb stem and a low tone verb stem are realized in the same way.

iii. There exists a tone hierarchy; lexical tones neutralize before grammatical tones and some grammatical tones neutralize before other grammatical tones.

Although the phonetic tones of simple tenses can be predicted, it has been observed that they cannot be generated in the usual way. This is due to the fact that we cannot tell how the underlying representations of these tenses should be formulated. The same morpheme (relative, negative, doubt ...) has different underlying tones depending on tense. Even where the underlying tone representation is straightforward, it is not easy to generate the tones since one would have to tell beforehand which tones were going to neutralize before the others. This observation makes it unlikely that these tones are derived.

I conclude, therefore, that all these complex tenses are memorized by native speakers rather than generated. The grammar that I am proposing is of course very complex and misses some important generalizations; but then there is no proof that simpler grammars are the psychologically real ones. The phenomenon that we are facing is indeed not unnatural. We are dealing with morphological rules, thus some parts of the grammar, namely morphology and the lexicon, have to be memorized, whereas phonological and syntactic rules are generated.

The irregularity of tone behaviour in this language would have the same explanation as that of rule morphologization in general. Usually phonological rules apply mechanically if their structural descriptions are met. Phonological rules become morphologized, however, if they destroy the paradigm or render opaque the grammatical function of the morpheme [Kimenyi, in preparation]. That is, languages have strategies for keeping the semantic information unaffected. We have noted that lexical tones are neutralized before morphological tones. This is so because morphology is very crucial in communicating both semantic and grammatical information.

There is a possibility also that some types of information might be more important than other types. This would explain the neutralization, in certain complex tenses, of some grammatical tones before others. The combination of tenses, in this instance, have been lexicalized, so to speak, and constitute for the native speaker one "psychological" tense. There is in fact some morphological evidence to support this hypothesis. First, we have observed that not only tones, but also segmental morphemes, neutralize. Thus the present and the habitual come out the same in relative and negative forms (Tables 3 & 4, forms a & b).

In some cases the tense markers of negative verbs are different from their affirmative counterparts. For instance, the present marker is -ra- in the affirmative but -0- in the negative; the "still" tense is realized as -rakYaa- in the affirmative but -ki- in the negative. The hortative morpheme is -raka- in the affirmative, but -ka- + subjunctive ending...
Table 3. Relative

<table>
<thead>
<tr>
<th>a.</th>
<th>ba-ra⁵</th>
<th>work-a</th>
<th>bakórá</th>
<th>H</th>
<th>baakoze</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>play-</td>
<td>bakíná</td>
<td>L</td>
<td></td>
<td>baakinne</td>
</tr>
<tr>
<td></td>
<td>like</td>
<td>bakuúndá</td>
<td>HL</td>
<td></td>
<td>baakuúnde</td>
</tr>
<tr>
<td>rel. 3pp-present-go -imperf.</td>
<td></td>
<td>bageéndá</td>
<td>LL</td>
<td>rel-3pp-rm.past-go -perfect</td>
<td>baageéndá</td>
</tr>
<tr>
<td>b.</td>
<td>ba-Ø₁</td>
<td>work-a</td>
<td>bakórá</td>
<td>H</td>
<td>bagikórá³</td>
</tr>
<tr>
<td></td>
<td>play-</td>
<td>bakíná</td>
<td>L</td>
<td></td>
<td>bagikíná</td>
</tr>
<tr>
<td></td>
<td>like</td>
<td>bakuúndá</td>
<td>HL</td>
<td></td>
<td>bagikuúndá</td>
</tr>
<tr>
<td>rel. 3pp-habit.-go -imperf.</td>
<td></td>
<td>bageéndá</td>
<td>LL</td>
<td>rel-3pp-still -go -imperf.</td>
<td>bakigaakeándá</td>
</tr>
<tr>
<td>c.</td>
<td>ba-zaa</td>
<td>work-a</td>
<td>bázáákóra</td>
<td>H</td>
<td>baakoze</td>
</tr>
<tr>
<td></td>
<td>play-</td>
<td>bázáákiná</td>
<td>L</td>
<td></td>
<td>baakinjá</td>
</tr>
<tr>
<td></td>
<td>like</td>
<td>bázáákúndá</td>
<td>HL</td>
<td></td>
<td>baakuúndá</td>
</tr>
<tr>
<td>rel. 3pp-future -go -imperf.</td>
<td></td>
<td>bázáageenda</td>
<td>LL</td>
<td>rel-3pp-cond.-go -imperf.</td>
<td>baageéndá</td>
</tr>
<tr>
<td>d.</td>
<td>ba-aa₁</td>
<td>work-ye</td>
<td>baakoze</td>
<td>H</td>
<td>'who V-ed'</td>
</tr>
<tr>
<td></td>
<td>play-</td>
<td>baakínë</td>
<td>L</td>
<td></td>
<td>'who are still V-ing'</td>
</tr>
<tr>
<td></td>
<td>like</td>
<td>baakuúnzë</td>
<td>HL</td>
<td></td>
<td>'who would V'</td>
</tr>
<tr>
<td>rel. 3pp-nr.past-go -perfect</td>
<td></td>
<td>baageéndë</td>
<td>LL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Glosses: a. 'who V' b.(=a) c. 'who will V' d. 'who V-ed' e.(= d) f. 'who are still V-ing' g. 'who would V'

---

Table 4. Tenses that take the negative nti-

<table>
<thead>
<tr>
<th>a.</th>
<th>nti- ba-ra⁵</th>
<th>work-a</th>
<th>H</th>
<th>nhibakórá</th>
<th>nhibakoze</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>play-</td>
<td>L</td>
<td>nhibakíná</td>
<td>nhibakinjë</td>
<td></td>
</tr>
<tr>
<td></td>
<td>like</td>
<td>HL</td>
<td>nhibakuúndá</td>
<td>nhibakuúnde</td>
<td></td>
</tr>
<tr>
<td>neg. 3pp-present-go -imperf.</td>
<td></td>
<td>nhibageéndá</td>
<td>LL</td>
<td>nhibageéndë</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>nti- ba-Ø₁</td>
<td>work-a</td>
<td>H</td>
<td>nhibakórá</td>
<td>nhibakoze</td>
</tr>
<tr>
<td></td>
<td>play-</td>
<td>L</td>
<td>nhibakíná</td>
<td>nhibakinjë</td>
<td></td>
</tr>
<tr>
<td></td>
<td>like</td>
<td>HL</td>
<td>nhibakuúndá</td>
<td>nhibakuúnde</td>
<td></td>
</tr>
<tr>
<td>neg. 3pp-habit.-go -imperf.</td>
<td></td>
<td>nhibageéndá</td>
<td>LL</td>
<td>nhibageéndë</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>nti- ba-zaa</td>
<td>work-a</td>
<td>H</td>
<td>nhibázáákóra</td>
<td>nhibágakore³</td>
</tr>
<tr>
<td></td>
<td>play-</td>
<td>L</td>
<td>nhibázáákína</td>
<td>nhibágakíne</td>
<td></td>
</tr>
<tr>
<td></td>
<td>like</td>
<td>HL</td>
<td>nhibázáákúndá</td>
<td>nhibágékuundë</td>
<td></td>
</tr>
<tr>
<td>neg. 3pp-future -go -imperf.</td>
<td></td>
<td>nhibázáageenda</td>
<td>LL</td>
<td>nhibágakíndë</td>
<td></td>
</tr>
</tbody>
</table>

---

| d.  | nti- ba-aa₁ | work-ye | H | nhibakoze |
|     | play-        | L      | nhibakinjë |
|     | like         | HL     | nhibakuúnde |
| neg. 3pp-rm.past-go -perf. | | nhibageéndë |
| e.  | nti- ba-aa₁ | work-ye | H | nhibakoze |
|     | play-        | L      | nhibakinjë |
|     | like         | HL     | nhibakuúnde |
| neg. 3pp- hort.₁ -go -imp. | | nhibágakeëndë |
### Table 4. Tenses that take the negative nti-, cont.

<table>
<thead>
<tr>
<th>g. nti- ba-rakYaa⁵-work-a</th>
<th>H nhibagikora³</th>
<th>i. nti- ba-zaa -work-e</th>
<th>H nhíbázaakore</th>
</tr>
</thead>
<tbody>
<tr>
<td>-play-</td>
<td>L nhibagikina</td>
<td>-play-</td>
<td>L nhibázaakine</td>
</tr>
<tr>
<td>-like-</td>
<td>HL nhibagikuunda</td>
<td>-like-</td>
<td>HL nhibázaakunde</td>
</tr>
<tr>
<td>neg-3pp-still -go -imp.</td>
<td>LL nhibakigeenda</td>
<td>neg-3pp-future -go -subj.</td>
<td>LL nhíbázaageende</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>h. nti- ba-ra⁵-work-e</th>
<th>H nhíbákore</th>
<th>j. nti- ba-raa -work-a</th>
<th>H nhíbáráákora</th>
</tr>
</thead>
<tbody>
<tr>
<td>-play-</td>
<td>L nhíbákine</td>
<td>-play-</td>
<td>L nhíbáráakina</td>
</tr>
<tr>
<td>-like-</td>
<td>HL nhíbákuunde</td>
<td>-like-</td>
<td>HL nhíbáráákunde</td>
</tr>
<tr>
<td>neg-3pp-nr.fut.-go -subj.</td>
<td>LL nhíbágeende</td>
<td>neg-3pp-not yet-go -imp.</td>
<td>LL nhíbáráageende</td>
</tr>
</tbody>
</table>

Glosses: a = b 'they don't V' c. 'they won't V' d = e 'they didn't V' f. 'may they not V' g. 'they don't V anymore' h = i. 'they shouldn't V' j. 'they haven't V-ed yet'

### Table 5. Tenses that take the -ta- morpheme

<table>
<thead>
<tr>
<th>a. - ba-ta-⁰₂ -work-a</th>
<th>H bádákórâ³</th>
<th>c/3 - ba-ta-aa₁ -work-ye</th>
<th>bátaakoze</th>
</tr>
</thead>
<tbody>
<tr>
<td>-play-</td>
<td>L bádákínâ</td>
<td>-play-</td>
<td>bátaakinne</td>
</tr>
<tr>
<td>-like-</td>
<td>HL bádákuúndâ</td>
<td>-like-</td>
<td>bátaakuunze</td>
</tr>
<tr>
<td>(part)-3pp-neg-partic.-go -imp.</td>
<td>LL bátaageéndâ</td>
<td>(dbt)-3pp-neg-nr.past-go -perf.</td>
<td>bátaageenze</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. - ba-ta-aa -work-a</th>
<th>H bádákórâ</th>
<th>c/4 - ba-ta-ara -work-ye</th>
<th>bátaarákóze</th>
</tr>
</thead>
<tbody>
<tr>
<td>-play-</td>
<td>L bádákínâ</td>
<td>-play-</td>
<td>bátaarákíne</td>
</tr>
<tr>
<td>-like-</td>
<td>HL bádákuúndâ</td>
<td>-like-</td>
<td>bátaarákúnze</td>
</tr>
<tr>
<td>(cond)-3pp-neg-cond. -go -imp.</td>
<td>LL bátaageéndà</td>
<td>(dbt)-3pp-neg-rm.past-go -perf.</td>
<td>bátaarágéenze</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c/1 - ba-ta-ra⁵ -work-a</th>
<th>H bádákórâ³</th>
<th>d/1 - ba-ta-ra⁵ -work-a</th>
<th>bádákórâ³</th>
</tr>
</thead>
<tbody>
<tr>
<td>-play-</td>
<td>L bádákínâ</td>
<td>-play-</td>
<td>bádákínâ</td>
</tr>
<tr>
<td>-like-</td>
<td>HL bádákuúndâ</td>
<td>-like-</td>
<td>bádákuúndâ</td>
</tr>
<tr>
<td>doubt-3pp-neg-present-go -imp.</td>
<td>LL bátaageéndà</td>
<td>(rel)-3pp-neg-present-go -imp.</td>
<td>bátaageéndà</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c/2 - ba-ta-zaa -work-a</th>
<th>H bátazáákórâ</th>
<th>d/2 - ba-ta-⁰₁ -work-a</th>
<th>bádákórâ³</th>
</tr>
</thead>
<tbody>
<tr>
<td>-play-</td>
<td>L bátazáákínâ</td>
<td>-play-</td>
<td>bádákínâ</td>
</tr>
<tr>
<td>-like-</td>
<td>HL bátazáákúndâ</td>
<td>-like-</td>
<td>bádákuúndâ</td>
</tr>
<tr>
<td>doubt-3pp-neg-future -go -imp.</td>
<td>LL bátazáageéndà</td>
<td>(rel)-3pp-neg-habit. -go -imp.</td>
<td>bátaageéndà</td>
</tr>
</tbody>
</table>
Table 5. Tenses that take the _-ta_ morpheme, cont.

<table>
<thead>
<tr>
<th>d/3</th>
<th>ba- ta-zaa</th>
<th>-work-a</th>
<th>H batázaákôra</th>
<th>d/6</th>
<th>ba- ta-rak’aa</th>
<th>-work-a</th>
<th>batagi korâ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-play-</td>
<td>L batázaakina</td>
<td></td>
<td></td>
<td>-play-</td>
<td>L batázi kuunda</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>HL batázaakkûnda</td>
<td></td>
<td></td>
<td>-like-</td>
<td>HL batázi kuunda</td>
<td></td>
</tr>
<tr>
<td>(rel)-3pp-neg-future</td>
<td>-go</td>
<td>-imp.</td>
<td>LL batázi ageenda</td>
<td>(rel)-3pp-neg-still</td>
<td>-go</td>
<td>-imp.</td>
<td>batagi geenda</td>
</tr>
<tr>
<td>d/4</td>
<td>ba- ta-aa1</td>
<td>-work-ye</td>
<td>H bataako zô</td>
<td>d/7</td>
<td>ba- ta-aa</td>
<td>-work-a</td>
<td>bataako râ</td>
</tr>
<tr>
<td></td>
<td>-play-</td>
<td>L bataakînne</td>
<td></td>
<td></td>
<td>-play-</td>
<td>L bataakînne</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>HL bataakuûndê</td>
<td></td>
<td></td>
<td>-like-</td>
<td>HL bataakuûndê</td>
<td></td>
</tr>
<tr>
<td>(rel)-3pp-neg-nr.past-go</td>
<td>-perf.</td>
<td>LL bataageenze</td>
<td></td>
<td>(rel)-3pp-neg-cond.</td>
<td>-go</td>
<td>-imp.</td>
<td>bataageendidâ</td>
</tr>
<tr>
<td>d/5</td>
<td>ba- ta-aara</td>
<td>-work-ye</td>
<td>H bataaközo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-play-</td>
<td>L bataakînne</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-like-</td>
<td>HL bataakuûndê</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(rel)-3pp-neg-rm.past-go</td>
<td>-perf.</td>
<td>LL bataageenze</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Glosses:

a. 'them without V-ing'

b. 'if they don't V'

c. 1. 'aren't they V-ing?'

2. 'will they V?'

3 = 4. 'didn't they V?'

d. 1 = 2 = 3 'who don't V'

4 = 5 'who didn't V'

6. 'who don't V anymore'

7. 'who wouldn't V'

---

Table 6. More forms that take the _-ta_ morpheme

<table>
<thead>
<tr>
<th>a. ba- ri # bu- ta-work-e</th>
<th>H bârî budakôrê</th>
<th>b. ku- ta-work-a</th>
<th>H kúdákôrâ</th>
</tr>
</thead>
<tbody>
<tr>
<td>-play-</td>
<td>L bârî budakînê</td>
<td>-play-</td>
<td>L kúdákînê</td>
</tr>
<tr>
<td>-like-</td>
<td>HL bârî budakuûndê</td>
<td>-like-</td>
<td>HL kúdakuûndê</td>
</tr>
<tr>
<td>3pp-cop # 1¼-neg-go -subj.</td>
<td>LL bârî butageendê</td>
<td>inf.-neg-go -imp.</td>
<td>LL kútageendê</td>
</tr>
</tbody>
</table>

Gloss: 'they won't V'

Gloss: 'not to V'

---

7If the main verb has an auxiliary, the negative marker can be marked either on the auxiliary or on the main verb. The other way to negate would be as follows:

kôrê

hibârî bu{kûndê} 'they don't V'

geendê
on the verb in the negative. The remote past morpheme in the affirmative
is -aara- but -aa- in the negative. This suggests, I believe, that
affirmative and negative tenses are independent of each other, not derived
from the same sources.

It seems also that the tenses in independent clauses are independent
of those in subordinate clauses. They are, as in the case of affirmative
versus negative, marked differently in some cases. We have noted already
that they have different negative markers, for instance, -ta- for subor­
dinate, but nti- for independent, clauses. As in negative verbs, the
morpheme -ra- is always deleted, the "still" tense is realized as -ki-
instead of -rakYaa-, and the remote past morpheme is -aa- instead of
-aara-. A grammar that would posit the same underlying structures, to
both affirmative and negative tenses, on the one hand, subordinate and
independent forms on the other hand, would not only be unmotivated but
also unnatural.

If I am correct in the explanation given here for grammatical tone
neutralization and its lexicalization, future research should be devoted
to grammatical tone hierarchies in order to predict the direction of tone
change in the Bantu verb system.

REFERENCES


casional Papers in Linguistics, no. 3. Los Angeles: University of
Southern California.

West Africa." Linguistic Inquiry 5:81-115

Mimeo. Astrida.

SCOPIL no. 3:169-181.

Kimenyi, A. 1977a. "Surface structure constraints and extrinsic rule or­
dering: evidence from glide formation and consonant insertion in Kinya­
rwanda." MS. Sacramento: California State University at Sacramento.

California State University at Sacramento.


A DIACHRONIC-TONOLOGICAL ANALYSIS OF CERTAIN
RANK SHIFTED VERBAL STRUCTURES IN NORTHERN SOTHO¹

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1. Introduction

While analysing the surface tone of certain verbal constructions in Northern Sotho some time ago, I ran into the difficulty that certain structures simply could not be analysed in terms of the tone rules which seemed to work for other aspects of the language.

The structures I am referring to include the so-called "future tense" as in:

(1) "Future"
   ba tlı́ e tl ꠬Sa
   they fut. it bring 'they will bring it'

and the so-called "long present tense" as in:

(2) "Present"
   ba á e tl ꠬Sa
   they pres. it bring 'they are bringing it'

Some light was thrown on this problem by Talmy Givón, when he made the statement that: "...the modality prefixes...and the verb-deriving suffixes ...have historically arisen from main verbs dominating sentential comple­ments" [Givón 1971:394].

2. Underlying Tone and Some Tone Rules

The starting-point for determining the tone rules² is the underlying tonal representation. If a syllable is realized as /+H/ in an environment of /-H/ syllables, then that /+H/ syllable is taken to be underlying /+H/.

¹I am greatly indebted to Profs. J. A. Louw and Fritz Ponelis, and Mr. Anthony Davey, for their valuable suggestions and criticism on the paper that preceded this article.

²A more complete exposition of the underlying tone and the tone rules of Northern Sotho (Pedi) can be found in Lombard [1976].
In terms of these principles, the following has been found:

a. The verb stem -tliJa 'bring' has an underlying /-H/-/-H/ tone sequence and therefore belongs to the low class of stems, e.g.:

\[(3) \text{go} \ tliJa \ 'to \ bring'\]

b. The infinitive prefix go- 'to' is underlying /-H/. (cf. (3))

c. The object agreement morpheme -é- 'it' is underlying /+H/, e.g.:

\[(4) \text{go } é \ tliJa \ \text{to } \overline{it} \ 'to \ bring \ it'\]

Furthermore, it is evident from this example that the underlying /-H/ first syllable of the verb stem is realized as [+H] on the surface. This can only be ascribed to the influence of the preceding /+H/ syllable, to which it is assimilated. Assimilation (TA) may be schematized as:

\[(5) \ \text{TA: } /-H/ \rightarrow [+H] /+H/ \rightarrow -H/\]

It should be pointed out that the word-final syllable at the end of an utterance is never assimilated to a preceding /+H/ syllable.

d. The future tense marker -tlo- 'shall, will' and the present tense marker -a- are both underlying /-H/:

\[(6) \text{ke } tlo \ tliJa \ 'I shall bring'\]

\[(7) \text{ke } a \ tliJa \ \text{I pres. bring } 'I \ am \ bringing'\]

e. The subject agreement morpheme bé- 'they' is underlying /+H/ as in:

\[(8) \text{bé } à \ tliJa \ \text{they pres. bring } 'they \ are \ bringing'\]

Again the first syllable following bé- is assimilated to [+H].

3. The Problem

The following underlying tonal representations of the two structures under discussion may be deduced from the foregoing:

\[(9) \ *bá \ tlo \ é \ tliJa \ \text{and } *bá \ a \ é \ tliJa\]

The first syllable of the verb stem is assimilated to [+H]:

\[(10) \ *bá \ tlo \ é \ tliJa \ \text{and } *bá \ a \ é \ tliJa \ \ (\text{TA, cf. (5)})\]

On the surface -tlo- and -a- are realized as [+H], but in this environment, in terms of the rules stated, assimilation cannot operate to change them to [+H]. On the other hand, the object agreement morpheme -é- cannot be changed to [-H] on the surface in terms of any known rule. But it is realized with a low pitch.

A possible explanation for these seemingly unaccountable surface pitch realizations is based on the hypothesis that at some earlier stage in their
4. The Future Tense

As far as the future tense is concerned, it has been convincingly argued by Ponelis [1975], working along the lines of Givón [1971; 1973], that the auxiliary verb -tilo is the result of rank shifting (cf. Halliday [1961:251]). He presents a synchronic semantic, syntactic and phonological analysis. Ponelis argues that the future tense:

(11) bá "tilo bapaia 'they will play'

is a development of the construction:

(12) bá || || go bapaia 'they come to play'

where || || is a clause boundary, and the construction consists of a main verb (Givón's modality verb) followed by an infinitival subordinate clause. Rank shifting takes place: the main verb becomes an auxiliary verb and the subordinate clause is turned into a part of the new verb phrase. Ponelis [1975:59] puts it clearly that the auxiliary verb is still a word (and not a morpheme). This will be explained fully later.

Concerning the semantics, Ponelis [1975:51] holds that the meaning of modality verbs tends to become subsidiary to that of the verb of the subordinate clause, semantic grammaticalization follows and categorial values like "future tense" are brought about.

Phonologically the future tense developed from free to categorial cliticization and the word status of the auxiliary verb is confirmed by tone rules, according to Ponelis [1975:47, 59].

With this exposition in mind, we can now have a closer look at the "future tense" from a tonological point of view. Note that we are employing the asterisk here, as in (9) and (10) above, to indicate an underlying or derivational step which cannot be a surface configuration. Starting from its underlying structure as main (modality) verb plus subordinate clause and assigning the underlying tones to each syllable, the result is:

(13) *bá || || go ẹ tilija 'they come to bring it'

In this first step, the main verb and subordinate clause become semantically and syntactically more integrated/tightly fused, as:

(14) *bá || go ẹ tilija

where || is a phrase boundary, and the two clauses have become a unit of main verb + fixed phrase.

In this environment it is possible for the stem -tila 'come' of
the main verb to be changed to [+H] under the influence of the preceding
/+H/ subject agreement morpheme (bá- 'they'), and followed by a phrase
boundary: *bá tša go é tšša. The a shows an instance of tonal
repetition. This type of tone influence is called repetition, which
differs from assimilation in the following respects:

a. The word-final syllable is changed to [+H], and

b. more than one syllable is subject to change, e.g.:
(15) *bá nyaka || go béréka → bá nyáká || go béréka  (Repetition)
     'they want to work'

where a .. a are the bearers of repeated [+H] tones, in their surface form.

Repetition (T Rep) may be schematized as in (16), where Σ = syllable:
(16) TRep: /

The main verb rank-shifts to an auxiliary verb followed by the new main
verb. In the process of rank shifting the g of the infinitive prefix
go- 'to' is deleted, followed by the coalescence of the a of -tša
and the o of go- (## represents a full word boundary):
(17) *bá tš # # tšša

Assimilation of the first syllable in the new main verb to the preceding
/+H/ object agreement morpheme -š- takes place:
(18) *bá tš # # tšša  (TA)

This leads to a succession of four /+H/ syllables—an environment
for the operation of dissimilation in terms of the rule:
(19) Tonal Dissimilation (TD): /+H/ → [-H] /+H/1 /+H/0
     [-stem] /+Σ/0

as follows:
(20) bá tš # # tšša  (TD)

We have now derived the "future tense" to its surface form, since (20)
is the same as example (1).

That -tšš must still be considered a word and not a prefixal mor-
pheme is in ter alia tonologically evident from the fact that the nega-

3To specify COMP more accurately, more research has to be undertaken
on the relation between the word category following the complement and
the tone of its initial syllable.
tive tone rule for Northern Sotho still treats -tlo as a monosyllabic verb stem. This rule causes monosyllabic verb stems of the Low class to be realized as [+H], e.g.:

(21) /go lwa/ 'to fight'
(22) go se lwé to not fight 'not to fight' (NEG)
(23) go se tló lwa to not fut. fight 'not to be going to fight' (NEG)

[ Ponelis 1975:59]

5. The Long Present Tense

Due to the lack of any synchronic comparable structures for the "long present tense", a diachronic approach has to be followed in analysing its present structure. According to Meinhof [1948:111] and van Warmelo [1927:90], the present tense -a- can be traced back to *-ya (*-ga according to Guthrie's transcription) as modality or main verb. Meinhof reports that it occurs in Konde as -ja 'be, become', followed by the infinitive and in Pedi (a dialect of Northern Sotho) as a, as in:

(24) ke a dira
I pres. do 'I am doing'

Meinhof [1932:31] puts it clearly: *γ (*g) is deleted in Sotho.

When the present tense is compared with the future tense, one is struck by the tonal similarity between the two structures, except in a few instances, which are not recorded in the following list. We will point these out at a later stage.

(25)

<table>
<thead>
<tr>
<th>Future</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. re tló hlaba</td>
<td>b. re a hlaba</td>
</tr>
<tr>
<td>'we will slaughter'</td>
<td>we pres. slaughter</td>
</tr>
<tr>
<td>c. ke tló dí tlátjä</td>
<td>d. ke a dí tlátjä</td>
</tr>
<tr>
<td>I will them fill</td>
<td>I pres. them fill</td>
</tr>
<tr>
<td>'I will fill them'</td>
<td>'I am filling them'</td>
</tr>
<tr>
<td>e. ó tló tiíjä</td>
<td>f. ó a tiíjä</td>
</tr>
<tr>
<td>'she will bring'</td>
<td>she pres. bring</td>
</tr>
<tr>
<td>g. ó tló ba bóláýa</td>
<td>h. ó a ba bóláýa</td>
</tr>
<tr>
<td>he will them kill</td>
<td>he pres. them kill</td>
</tr>
<tr>
<td>'he will kill them'</td>
<td>'he is killing them'</td>
</tr>
</tbody>
</table>

As already indicated, the present tense marker -a- is underlying /-H/.
When comparing it with the future tense marker it may be deduced that the original modality/main verb *-ya is also underlying /-H/.
Tonological and morphological data indicate that the subordinate clause in these constructions can only be either infinitive or consecutive (cf. Lombard [1976:166]). The infinitive prefix and the consecutive subject agreement morpheme have an underlying /-H/ tone, which has the least tonological influence on the verb itself. Therefore, the original construction can, for example, be taken to be either (26) or (27):

(26) *bá́ ya || || go ́ tli Já
   they pres. to it bring

(27) *bá́ ya || || ba ́ tli Já
   they pres. they it bring

The following step would then be that the main/modality verb and the subordinate clause become more integrated:

(28) *bá́ ya || {go}́ tli Já

This is followed by the repetition of the /+H/ on the subject agreement morpheme on the modality/main verb *-ya:

(29) *bá́ ya || {go}́ tli Já (TRep)

Rank shifting takes place and the γ of the main/modality verb *-γá is deleted to result in -á- as the present modality morpheme. The infinitive prefix go- or the consecutive subject agreement morpheme is also deleted (+ = morpheme boundary):

(30) *bá́ á́ + tli Já (Rank shift)

The first syllable of the new main verb -tli Já is assimilated to /+H/ by the preceding /+H/ object agreement morpheme:

(31) *bá́ á́ + tli Já (TA)

Finally, the object agreement morpheme is dissimilated to /-H/:

(32) bá́ á́ + e tli Já (TD)

As we have shown the full derivation of the "future tense" by examples leading up to (20), which is identical to (1), we have now shown the full derivation of the "long present", since (32) = (2). That the modality/main verb is shifted in rank to be realized as a morpheme is inter alia evident from the fact that it is subject to dissimilation in a favourable tonological environment, e.g.:

(33) *ó́ á́ + é́ lwa

which is realized on the surface as:

(34) ó́ á́ + é́ lwa (TD)
   he pres. it fight 'he is involved in a fight'
6. Differences Between Future and Present

When it occurs in a similar tonological environment, the future tense marker is never dissimilated, but is realized with a /+H -H/ tone sequence (phonetically a falling tone) concomitant with a half-long vowel:

(35) ő tlo· # # ų lwa

he will it fight 'he will be involved in a fight'

In other words, dissimilation is realized when the historical word boundary is deleted, but not when the full word boundary is still present. According to Hyman [1975:196] a full word boundary is "hard to penetrate" and therefore dissimilation is not realized in the case of the future tense.

The /+H -H/ tone sequence is the result of the coalescence and fusion of -tlo as original main/modality verb being /+H/ due to repetition, and the underlying /-H/ of the infinitive go-. This fusion gives rise to inherent quantity (being realized as a half-long vowel), which reveals the polymorphemic origin of -tlo and that clarifies its /+H -H/ tone sequence.

On the other hand, the present tense marker -a- is never realized with a /+H -H/ tone sequence, not even in rhythmic quantity position (i.e. the penultimate syllable in a sentence). This is evident from the following comparison:

(36) a. bá tlo: # # já b. bá a: + já

'they will eat' they pres. eat 'they are eating'

This indicates that no trace of fusion or coalescence is left in -a- and it is realized as a single morpheme.

Another reason why Ponelis [1975:59] regards the future tense -tlo as a word is that the relative suffix -g6 is affixed to a word, a verb, e.g.:

(37) (bá) bá tlo·-g6 # # tlijá (−TA)

(those) they will-who bring 'they who will bring'

His view is tonologically supported by the absence of the assimilation of the first syllable of the new main verb. This can only be ascribed to the ability of the full word boundary to block the operation of this rule. Similarly, dissimilation is blocked by the full word boundary in an otherwise favourable tonological environment:

(38) (bá) bá tlo·-g6 # # ų tlijá (−TD)

(those) they will-who it bring 'they who will bring it'
in which the object agreement morpheme ų- is not dissimilated.

This same phenomenon also occurs in an environment where the final /+H/ syllable in an utterance is lowered when preceded by a /+H/ penul-
imate syllable. This may be formalized as Final-syllable Lowering (FsL), below, where sentence boundary is marked by $\#$:

$$(39) \quad \text{FsL: } [+H] \rightarrow [-H] / [+H/] \#$$

This rule operates, for instance, when an underlying $/+H/$ monosyllabic verb stem in sentence-final position is preceded by the $/+H/$ subject agreement morpheme as penultimate syllable:

$$(40) \quad *gab'fe' \rightarrow gab've' \# \quad \text{(FsL)}$$

'not they give' 'they don't give'

Final-syllable lowering is blocked when a full word boundary precedes the final syllable in the future tense with the relative suffix, e.g.:

$$(41) \quad (b\bar{a}) \quad b\bar{a} \ t\bar{l}o \ -g\bar{o} \ # \ # \ f\bar{a} \quad \text{(-FsL)}$$

'(those) they will-who give' 'they who will give'

7. **Summary**

Tonological evidence supports the following points:

a. Both constructions developed from a main/modality verb plus subordinate clause sequence.

b. The whole structure with $-t\bar{l}o$ has rank-shifted from a separate clause with a main verb to a part of a clause with $-t\bar{l}o$ as an auxiliary. This is evident from the fact that:
   1. $-t\bar{l}o$ is not subject to dissimilation (35),
   2. it is realized with a $/+H -H/$ sequence concomitant with inherent quantity (35),
   3. assimilation of the first syllable after the full word boundary is absent (37),
   4. dissimilation in an otherwise favourable tonological environment is blocked by the presence of the full word boundary (38),
   5. final-syllable lowering does not operate when preceded by a full word boundary (41), and
   6. it is treated as a monosyllabic verb stem by the negative tone rule (23).

c. The present tense marker has shifted in rank from main/modality verb to become a single **morpheme**, a modality prefix. This is evident from the fact that:
   1. it is subject to dissimilation (34), and
   2. it is not realized with a $/+H -H/$ tone sequence—-not even in rhythmic quantity position (36).

Without any doubt, these structures can be interpreted along the
same lines for other Bantu languages. In this regard, Dr. Hazel Carter (London University) informed me in a personal communication that this historical development is supported tonologically in the case of Shona (Zezuru) for both structures. Furthermore, she presented synchronic evidence to illustrate different stages of development\(^4\) in Northern and Southern Tonga, e.g.:

<table>
<thead>
<tr>
<th>Northern</th>
<th>Southern</th>
</tr>
</thead>
<tbody>
<tr>
<td>u-na ku-langa</td>
<td>unoolanga</td>
</tr>
</tbody>
</table>

"he will look"

\(^4\)Ponelis [1975:47,48] also refers to Zulu in connection with this phenomenon.
REFERENCES


DOWNSTEP DISPLACEMENT IN KIKUYU (abstract)

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G. N. Clements
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1. We are concerned with a number of processes in Kikuyu tonal phonology involving downstep, and with the contribution Kikuyu affords to our understanding of the status of downstep in phonological theory. Specifically, we propose to view downstep as a phonological entity ordered among the tonemes which constitute an independent level of phonological representations [Clements 1976], rather than, as in some treatments, an intonational process determined by certain features (or configurations of features) within the feature matrices defining tones.

We review the major tonal processes involving DS (downstep) in 23 Kikuyu idiolects, representative of the northern, southern, and western districts of the Kikuyu-speaking region. The processes in question are rules of phrase phonology (rules of "external sandhi"), dependent upon both a bipartite division of nongrammatical morphemes (for the most part, independent words) into two tonal classes, I and II, and the syntactic configurations in which these may occur. These processes are summarized in the following sections. In several cases, it can be shown that significant generalizations can be formulated only if DS is viewed as an entity ordered among strings of tonemes. Space permits the discussion of only two such cases in this abstract.

2.1 Noninterrogative sentences are marked finally by intonational processes of key-lowering which can be summarized as follows:

R.O. $\emptyset \rightarrow /_LQ(H_Q)^S$ (where $L_Q$ is a maximal string of $L$ tones)

né mwayáhiñá [- - - -] 'he's a weakling'
mwayáhiñá mórito [- - - - -] 'heavy weakling'

It will be noted that DS is "total" (Meeussen) in the sense that a sequence $L^1H$ is phonetically equivalent to the sequence $LL$, the sequence $H^1H$ to the sequence $HL$, etc. As RO is an automatic, exceptionless process in these sentences the DSs it introduces are fully predictable and are not indicated in the examples.
2.2 Words of all word-classes (excluding grammatical particles) are classified into one of two sets, I and II as mentioned above, according to whether they do (II) or do not (I) undergo a rule of tone flattening to be discussed below (sec. 2.5). This classification is also relevant to the formulation of the DS insertion rules. Certain details aside, DS is introduced into strings after every item of class I, except in two environments: (i) between a verb and a following N, ADJ, or ADV (this restriction applies in positive statements only), and (ii) between the head of a NP and the first following complement. DS is introduced after class II items in more restricted circumstances, namely, after the first complement to a V, in positive statements.

2.3 By a process of DS displacement, a DS following a H tone introduced by the rules described above is copied to the right of a string of following L tones, all of which become H; the original DS is deleted in all but one of the idiolects considered. This is the rule termed "block raising" in Ford [1975].

\[ \text{R1. } !L_Q \to H_Q / H \]

/nyahéisiré mwayáhíná moṣaké/ 'he-gave weakling tobacco-plant'

<p>| | | | |</p>
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<thead>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>L</td>
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<td>L</td>
</tr>
<tr>
<td>L</td>
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<td>L</td>
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<tr>
<td>(after DS placement)</td>
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<td>(by R1, in majority idiolects)</td>
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2.4 In certain words a H tone spreads to a following L tone across any word boundary not marked by DS, if the following root tone is L:

\[ \text{R2. } L \to H / H \# ___ L \]

2.5 The final H tones of class II items become L sentence-finally after L, unless immediately following the main verb in a positive statement:

\[ \text{R3. } H_Q \to L_Q / L \# S \]

The syntactic condition has not been included in this formulation of the rule. This is because it is unnecessary, given the rules of DS insertion stated in sec. 2.2. Note that in positive statements (only), DS is inserted after the first complement to a N or V. In such sentences, therefore, items of class II ending in final H tone will be of the form: \( \ldots H \) \# S. Due to the presence of DS, such items will not meet the structural description of R3. Cf. the following examples: (i) nē kēyirēryā! 'it's a hindrance' (positive statement: R3 inapplicable); (ii) kēyirērya 'hindrance' (citation form: no DS inserted, and R3 applies).

These facts strongly support the view that DS is an entity ordered among tonemes in phonological representations. Under the contrary assumption, there is no way of relating the fact that DS is inserted, and R3 fails to apply, in exactly the same set of circumstances.

2.6 Final H tones are classified as \([^* \text{stable}]\) [Ford 1975]. It is
not impossible that this diacritic marking may be eliminable in favor of a purely phonological analysis, but this will not affect our discussion. All unstable H (UH) tones become L before a H tone across a WB, provided that no DS intervenes:

R4. UH + L / ___ # H

As before (sec. 2.5), no special mention need be made of the condition that no DS intervenes, since a string of the shape UH # ! H does not meet the SD of the rule.

2.7 Two contiguous DSs undergo context-free deletion:

R5. !! → Ø

2.8 These rules can be illustrated by the following further derivation (all items crucially involved are class I):

he gave Njuguna banana heavy one long ago very
/né ahejiré njogóña iriyo irito rámwe téèse mons /

| | | | | | | | | | | | | | | | | | | | | |
| H | L | H | L | H | L | H | L | L | L | H | L | L | L | L | L | H | L | L |

(by DS intro)

(by R1)

(by R2)

(by R4)

(by R5)

Naturally, single DSs remaining in strings after the operation of R1 are not deleted (see e.g. the example in sec. 2.3). Sentence-final DSs have no phonetic effect.

3.0 The summary of Kikuyu tone sandhi presented here can only be regarded as a very schematic overview of a system that offers many complexities. We believe, however, that it accurately characterizes the nature, if not the detail, of the tonal processes involved.

REFERENCES


IDIOSYNCRATIC, SUPRASEGMENTAL PROCESSES IN MENDE

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1. Introduction

In my paper read before the conference on African linguistics in Gainesville [Dwyer 1976], I claimed that Mende was not a suprasegmental tone language of the type envisioned by Leben [1973]. Yet, in that paper I suggested that there were a number of processes in Mende which nevertheless appeared to be of a suprasegmental nature. In this paper, I present two types of these processes, the development of the H HL tone pattern and "demorphologized" compounds and then show first how these phenomena support an autosegmental view of phonology and second, how idiosyncratic features fit into a general theory of phonology.

2. The Development of the H HL Tone Pattern

Mende contains a small set of disyllabic morphemes that display a high-falling tone pattern. These words, taken from Spears [1968] are given in (1):

(1) ngɔŋŋɔ tooth hókpɔ navel pɔkɔ imitate
tɔkplɔ seat, bottom mbémbe circle

Because examples of this tonal pattern are few in number and because this pattern is not present in Proto Southwestern Mande, the high-falling tone pattern appears to be a fairly recent development in Mende. The ways in which this pattern arose provide an important insight into the nature of suprasegmental tone processes.

One source of this tone pattern appears to be from the loss of a final low-toned syllable with the reassignment of the low tone to the preceding syllable. Evidence for this comes from the various alternate forms reported for 'tooth' and 'navel' by Spears [1968] and by Innes [1969]. Interestingly, these variants do not all appear in the same dialect, or possibly idiolect, but appear to be randomly distributed as the following example (2) illustrates:

(2) ngɔŋŋɔl (S), ngɔŋŋɔu (I), ngɔŋŋɔ (S), ngɔŋŋɔ (S,I) S=Spears [68]
    hókpɔl (I), hókpɔ (I), hókpɔ (I), hókpɔ (S,I) I=Innes [69]
Clearly the variants given in (2) suggest a progression from left to right and that some of the forms given in (1) represent reduced versions of fuller forms. And from this analysis we can conclude that a suprasegmental tonal process is involved. By suprasegmental I mean that the tonal melody of the words in question is to some extent independent of the composition of the segments to which the melody is associated. This suprasegmental process is adequately described by the autosegmental framework developed by Goldsmith [1976], as the following derivation (3) illustrates:

(3) \[ \text{H L} \quad \text{H L} \quad \text{H L} \]
\[ \text{ngon'oo} \rightarrow \text{ngon'oo} \rightarrow \text{ngon'oo} \]

It is important to also note that this process is idiosyncratic, that is, it does not apply to all potential forms. For example, neither Innes nor Spears recorded all variations from their sources. Secondly, not all potential inputs to the process described in (3) undergo the process, as the examples in (4) illustrate:

(4) kpôngbón\' \sim *kpôngbô 'palsy'
ngèn'gê \sim *ngèngê 'finger nail'
bôtân\' \sim *bôtâ 'fist'

A second source for the high-falling tone pattern appears to result from syncope rather than from apocope. This process differs from the first because it results in a medial consonant-liquid cluster. The following set of examples (5) show the optional application of this process:

(5) ngîlè \sim nglé 'dog'
kûlô \sim klô 'small'
ngûlô \sim nglé 'oil'

On the basis of this evidence, it appears likely that a word like tôkplâ with its consonant-liquid cluster was originally derived from a fuller form, say tôkplô or tôkpâlê in much the same way that the short form fûfûlô 'dust' is derived from its free variant fûfûlô.

In considering this second process, it too is clearly suprasegmental in nature and is clearly idiosyncratic. Thus the development of the high-falling tone pattern in Mende appears to be the result of two independent processes, both of which are idiosyncratic and both of which are suprasegmental in nature.

Evidence of this sort, the loss of a segment and the reassignment of its tone to an adjacent syllable, has been used by Goldsmith [1976] and others to support an autosegmental view of phonology. The data may be novel in the sense that these processes are highly idiosyncratic, but as such do not really provide any new support for the autosegmental position.
In the next section, I present evidence that if correct provides even stronger evidence in support of autosegmental compounds.

3. **Demorphologized Compounds**

A detailed examination of the Mende lexicon reveals a substantial number of word forms which appear to be compounds on the basis of their general morphological appearance, but which in one way or another deviate from compounds. In Table 1, items (a-c) represent normal compounds, while the others (d-m) represent what I call demorphologized compounds.

I use the term "demorphologized compounds" because these forms cannot be directly generated from their constituent morphemes without the additional application of ad hoc rules, implying of course that these forms are no longer regarded as morphologically complex and consequently entered as individual units in the lexicon. By the term "true compound" I mean the anticipated form of the compound were it derived from the suggested constituents using the known compound rules. For details see Spears [1968].

In examining these compounds, it becomes clear that while these demorphologized compounds (examples (e) through (m)) appear to be the result of idiosyncratic processes, their form is nevertheless constrained in a very definite way. In order to demonstrate this, the following observations are important:

(6) a. Item (e) and (f) have the same number of syllables as the true compound.

b. Items (f, g, h, i, j and k) have one less syllable than the true compound.

c. Item (l) has the same number of syllables as the true compound, but the tones have been repositioned.

d. Item (m) has one more syllable than the true compound.

Assuming that the "demorphologized" compounds were originally derived from their corresponding true compounds, an assumption which is by no means certain, the question arises: in what way are they derived and what principle do they follow? A closer examination reveals that they all have three syllables and three tones. This observation could be explained by what I call the principle of tonal/segmental parity (7):

(7) The least marked relationship that can exist between a tonal melody and a string of syllables is for each note of the melody to be uniquely associated with one tone-bearing segment.

All of the examples in Table 1 contain a three note melody (L H L). Using the principle of tonal/segmental parity we would expect that items
<table>
<thead>
<tr>
<th>Gloss</th>
<th>Demorphologized</th>
<th>True Compound</th>
<th>First Constituent</th>
<th>Second Constituent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. woman</td>
<td>nyàhà</td>
<td>nyà + hà</td>
<td>nyà</td>
<td>hà</td>
</tr>
<tr>
<td>b. child</td>
<td>ndòpò</td>
<td>ndò + pò</td>
<td>ndò</td>
<td>pò</td>
</tr>
<tr>
<td>c. tear</td>
<td>ngàyà</td>
<td>ngà + yà</td>
<td>ngà</td>
<td>yà</td>
</tr>
<tr>
<td>d. fire</td>
<td>ngòmbû</td>
<td>ngòm + bû</td>
<td>ngòm</td>
<td>bû</td>
</tr>
<tr>
<td>e. girl</td>
<td>nyàápò</td>
<td>nyàhà + pò</td>
<td>nyàhà</td>
<td>pò</td>
</tr>
<tr>
<td>f. male</td>
<td>hììndò</td>
<td>hìì + ndò</td>
<td>hìì</td>
<td>ndò</td>
</tr>
<tr>
<td>g. potato leaf</td>
<td>njòlàà</td>
<td>njòpò + làwà</td>
<td>njòpò</td>
<td>làwà</td>
</tr>
<tr>
<td>h. God</td>
<td>ngèwòò</td>
<td>ngèlè + wòò</td>
<td>ngèlè</td>
<td>wòò</td>
</tr>
<tr>
<td>i. spy</td>
<td>mànèè</td>
<td>mà + nènè</td>
<td>mà</td>
<td>nènè</td>
</tr>
<tr>
<td>j. pipe</td>
<td>tàvéè</td>
<td>tàwà + vèè</td>
<td>tàwà</td>
<td>vèè</td>
</tr>
<tr>
<td>k. snuff</td>
<td>tàvúkà</td>
<td>tàwà + vúkà</td>
<td>tàwà</td>
<td>vúkà</td>
</tr>
<tr>
<td>l. morning</td>
<td>ngèéndà</td>
<td>ngèlè + ndà</td>
<td>ngèlè</td>
<td>ndà</td>
</tr>
<tr>
<td>m. saliva</td>
<td>ndàáyà</td>
<td>ndà + yà</td>
<td>ndà</td>
<td>yà</td>
</tr>
</tbody>
</table>
(e) and (f) would be fully unmarked in this respect because they have the same number of notes and syllables. Accordingly, items (g) through (k) would be considered marked because they contain one more tone-bearing segment than notes. Thus, the demorphologized compounds appear to have achieved parity through the loss of a tone-bearing segment. And surprisingly, item (l) while having the same number of notes and tone-bearing segments, achieves parity through the reassociation of the notes according to the principle in (7). Finally, and even more surprising, in order to achieve the supposed tonal/segmental parity, the demorphologized compound (item (m)) appears to have acquired an additional tone-bearing segment, when compared to its "true" form. These developments are summarized in (8) below, using an autosegmental notation:

(8)  a. Syllable Maintaining  
     \[ \begin{array}{c | c | c | c | c | c } 
     & L & L & H & L & L \\
     \hline 
     & 1 & 1 & 1 & 1 & 1 \\
     \end{array} \] 
     nyaa + po → nyaapo 

b. Syllable Decreasing  
     \[ \begin{array}{c | c | c | c | c | c } 
     & L & L & H & L & L \\
     \hline 
     & 1 & 1 & 1 & 1 & 1 \\
     \end{array} \] 
     tawa + vuka → tavuka 

c. Note Reassigning  
     \[ \begin{array}{c | c | c | c | c | c } 
     & L & H & L & L & L \\
     \hline 
     & 1 & 1 & 1 & 1 & 1 \\
     \end{array} \] 
     ngele + nda →ngeenda 

d. Syllable Decreasing  
     \[ \begin{array}{c | c | c | c | c | c } 
     & L & H & L & L & L \\
     \hline 
     & 1 & 1 & 1 & 1 & 1 \\
     \end{array} \] 
     nda + ya → nda ya → ndaaya 

As mentioned earlier, the principle of tonal/segmental parity, if correct, offers even stronger support for the partial autonomy of the tonal tier. In this instance, not only is the tonal melody preserved, but under certain conditions which are as yet not fully understood, the tonal tier can actually affect the segmental composition of a given word, as was evidenced by the evolution of the word "saliva" given in (8d).

At this point caution should be exercised, because thus far only one such example of the progression (8d) has been found, and consequently the strength of the claim made above is slight. Nevertheless, additional support for the principle of tonal parity can be found elsewhere in Mende, and again we observe that these examples involve idiosyncratic processes.

The first set of examples (9) involves four pairs of free variants. In each of these cases, evidence can be presented to show that the shorter form has been derived from the longer form, at least historically, thus representing a progression that is in accord with the principal of tonal/segmental parity. Again, it is of interest that these alternations must be considered idiosyncratic because not all words of this type show these alternations.

(9)  pōma  ~  pōma  back, behind 
     ngjọngọjọ  ~  ngọngọjọ  
     njatọlọ  ~  njatọ  water plant (njạ = water) 
     ngọlịkụ  ~  ngọhụ  ear 
     gravel
Furthermore the alternation of the word glossed as 'gravel', which in its full form is clearly a reduplicated morpheme, suggests that the large percentage of words of the type: C1V1C1V2C2 may also be reduced reduplicates which are moving in the direction of tonal/segmental parity. These examples are given in (10) below:

(10) ndɔːlɔ < *ndɔlɔ + lɔlɔ earth, ground
    kɔːlɔ < *kɔlɔ + kɔlɔ to seek
    kɛɛlɛ < *kɛlɛ + kɛlɛ fraction
    fʊfʊlɔ < *fʊlɔ + fʊlɔ dust
    fɛlɛ < *fɛlɛ + vɛlɛ shake (dry)
    tɔɔlɔ < *tɔlɔ + lɔlɔ kola nut

The evidence given in (9) and (10) strongly suggests that the principle of tonal/segmental parity (7) is a true operating principle in Mende, and interestingly suggests one way in which partially reduplicated forms arise diachronically.

Before going further, I would like to point out an apparent contradiction to the principle in (7). The data presented in section one show that certain processes appear to operate against the principle of tonal/segmental parity, because it results in a falling tone (where two notes are assigned to the same syllable).

This development may not be in opposition to the principle, however, for a number of reasons. First, the reason for the developments in section 2 appears to be reduction processes, while that in section 3 appears to be a word internal readjustment. Thus section 2 processes can be seen as bunching processes while section 3 processes are unmarking processes. Second, we may note that while the association of notes in (1) may violate the principle in (7), the numbers of notes and tone-bearing segments do not. Given this second observation, we might expect the derived H HL words in (1) to eventually reduce to H L words, because of the principle of tonal/segmental parity.

Although it is not clear at this point, there is some evidence in the history of Southwestern Mande (of which Mende is a member) that the restructuring of H HL to H L may have taken place once before.

The Southwestern Mande languages contain a small set of morphemes which have a high-falling pattern in Loko, a high-high pattern in Bandi, and a high-low tone pattern in Mende and Kpelle (the Loma data is irrelevant here). The generally accepted family tree relationship of these languages is given in (11):
suggests a situation more awkward than the new alternative suggested here, the possibility of a parallel evolution of $H HL$ to $H L$ in both Mende and Kpelle can be tolerated.

Furthermore, this reinterpretation of the development of this tonal pattern permits a better statement of its development in Southwestern Mande. According to Dwyer [1973], only two tonal classes in Southwestern Mande have cognates in Northern Mande (the most closely related group of languages). These are $*(H)H$ and $*(L)P$, where $P =$ polarized tone, while the remainder: $*L HL$, $*H~reanalyzed here as $*H HL$) and $*L L$ represent recent (Proto Southwestern Mande) innovations. Evidence of the sort presented in (6) was used to suggest that the $*L HL$ tone patterns may have resulted from opaque nominal compounds while the remainder could only be explained as borrowings. With the reanalysis of $*H L$ as $*H HL$, it is possible to suggest that at least some of the $H HL$ words arose from the processes illustrated in section one of this paper. The result of this reanalysis, in addition to maintaining coherence with the principle of tonal/segmental parity, suggests that borrowing may have had less influence on the development of Southwestern Mande tone patterns than was previously supposed.

4. Implications

This paper raises a number of issues which may serve as avenues of future research:

a. the nature of idiosyncratic tone processes
b. the nature of phonological complexity or markedness

4.1 Idiosyncratic processes. Each of the suprasegmental processes described here are idiosyncratic in nature. That is, while we can provide a statement of the class of words which undergo a particular process, we cannot identify the specific words which fit that process. This notion parallels Labov's [1972] observation of the fronting rule in New York City English. While it is possible to characterize the class of words undergoing this process (those containing $\sim \sim $), not all of the words in this class undergo this fronting process. Furthermore, even though the number of words which do undergo the process are increasing, it was impossible to determine which word would be next. Although these processes have been characterized as idiosyncratic with respect to the particular words to which they apply, the nature of the phonological changes are clearly identifiable as a legitimate phonological process. Thus, once a particular phonological string undergoes a particular rule, there is no doubt as to its outcome.
The fact that idiosyncratic processes exist in language gives rise to the question how might this fact be incorporated into a theory of phonology and why? The question can most appropriately be answered given a lexicalist view of the lexicon such as that provided by Jackendoff [1975], who argues that whole words as strings of morphemes are stored in the lexicon rather than individual morphemes as the 1965 Aspects model suggests.

Given this view, we can distinguish between idiosyncratic rules which apply within the lexicon and the standard, regular rules which apply to the output of the lexicon. (The model of "upside down phonology" as put forward by Leben and Robinson [1975] with its notion of frozen rule could easily be incorporated in this framework, as could the notions of natural phonology put forth by Vennemann, Stampe and Hooper.) Although space does not permit a full elaboration of the point, it is worth noting that many rules which start out as idiosyncratic rules later become regular and then apply to all words which meet the structural description of the rule. This observation provides at least one answer to the complex question: where do (regular) phonological rules come from?

Secondly, a systematic examination of these idiosyncratic processes may lead to a better understanding as to why such processes exist, particularly in the light of "reductive" processes. Drawing from Zipf's observation that there is a strong positive correlation between a word's semantic complexity and its phonological complexity, Eulenberg [1964] concludes that rules actually operate to bring about a better balance between semantic content and phonological content. Eulenberg further points out that such a proposal does not "itself predict the existence or exact nature of individual rules, but rather acts as a constraint on the definition of a possible...rule" [Eulenberg 1964:198].

Before going further, I would like to add to this proposal the suggestion that the frequency of use of a given morpheme may have an equally important bearing on the question of phonological complexity as well. This is consistent with Zipf's observation because function words are not only smaller in semantic content than major category words, but more frequent in occurrence.

Logically following from this proposition is the conclusion that idiosyncratic rules are those which generally cope with an informational imbalance of individual lexical items while regular rules are those which cope with the imbalance of whole word classes. Taking this fact and the observation that word classes are generally defined by affixes, and the fact that the semantic content of an affix is considerably less than the free standing word from which it is derived, we can begin to see why so many regular (morphophonemic) rules involve affix boundaries while the idiosyncratic processes do not, and why morphophonemic rules are reductive.

This brief statement is intended to give an insight into the nature of idiosyncratic phonological rules and their relationship to a general
theory of phonology and into the complex question why are there phonological rules. In closing this section I would like to add that the study of the idiosyncratic processes through time has largely been neglected in favor of the more impressive regular developments. In this regard, I would venture to say that a diachronic investigation of idiosyncratic processes would prove to be as rewarding as has been the diachronic study of the regular processes.

4.2 The nature of phonological complexity. The principle of tonal/segmental parity (7) suggests an interesting axiom, that of phonological tension:

(12) The association of two notes of any tier with the same segmental unit is more complex than the association of a single such note.

While space does not permit an elaboration of this principle, the following examples will give an illustration of how this principle might be used to explain certain types of developments.

4.2.1 The definite suffix. The definite suffix -f in Mende has two effects on the phonetic realization of Mende nouns. First, under certain conditions, it may cause a fronting of the preceding vowel; second, it may assimilate to that vowel. (There are also situations where no effect occurs.) These situations are given in (13), where tone is not relevant:

(13) /maha-i/ [mahi] /fala-i/ [fala-a]

The conditioning factors for these developments are at least complex and probably will involve the use of a diacritic feature; however, these facts are not relevant to the task of illustrating phonological tension.

When the affix -f is added, tension is created (14):

(14)  

<table>
<thead>
<tr>
<th>Lo</th>
<th>Hi</th>
<th>Lo</th>
<th>Hi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bk</td>
<td>Fr</td>
<td>Bk</td>
<td>Fr</td>
</tr>
<tr>
<td>fala-i</td>
<td>maha-i</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVC V</td>
<td>CVC V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This tension results from a conflict between two autosegmental tiers: the oral feature tier and the major class tier. Because the final segment of the noun and the only segment of the suffix are vowels, a single vowel note is assigned to these segments (a-i in the above examples). Because each vowel requires different oral features, a situation of phonological tension arises. To resolve this, readjustments are required. For example, tension can be relieved by shedding some notes from one tier or the other. Interestingly, each of the examples in (14) undergoes a different tension-releasing process to arrive at the observed surface form, given in (15). In the first example, fala-f the definite suffix loses its markings of [high] and [front]; in the second example the final vowel of the noun acquires the frontness of the affix.
By the definition of tension in (12), each of the forms in (15) can be seen to be less tense versions of their underlying forms. Likewise, the developments given in (2) can also be seen to follow a tension-reducing progression.

These two examples serve to illustrate that the principle of tonal/segmental parity and its more general case, phonological tension, may be useful in explaining why certain types of phonological rules develop the way they do. First, the addition of an affix creates tension which subsequently is reduced by phonological rules.

5. Conclusion

In this paper, I have examined a number of idiosyncratic phonological (suprasegmental) processes in order to demonstrate, first, that while these processes are idiosyncratic, they are not random, and second, that because they are not random they are of phonological interest. The particular interest that such processes give concerns 1) the relationship between general and idiosyncratic processes, 2) the possible origin of some types of phonological processes, and 3) an insight into the interrelationship between various melodic tiers such as tone, vowel quality, etc.

REFERENCES


## TABLE OF CONTENTS

**Volume VII (1976)**

- J. Peter Denny, and Chet A. Creider, THE SEMANTICS OF NOUN CLASSES IN PROTO-BANTU .......... 1
- Charles W. Kisseberth and Mohammad Imam Abasheikh, ON THE INTERACTION OF PHONOLOGY AND MORPHOLOGY: A CHI-MWI:NI EXAMPLE ........ 31
- Herbert F. W. Stahlke, SEGMENT SEQUENCES AND SEGMENTAL FUSION .................. 41
- Robert W. Wilkinson, CONTRAST PRESENTATION IN YORUBA .......... 65
- Stephen R. Anderson, ON THE DESCRIPTION OF CONSONANT GRADATION IN FULA ........ 93
- Ellen Contini Morava, STATISTICAL DEMONSTRATION OF A MEANING: THE SWAHILI LOCATIVES IN EXISTENTIAL ASSERTIONS .... 137
- Michael Burton and Lorraine Kirk, SEMANTIC REALITY OF BANTU NOUN CLASSES: THE KIKUYU CASE ........ 157
- John M. Clifton, DOWNDRIFT AND RULE ORDERING ........ 175
- Zygmunt Frajzyngier, RULE INVERSION IN CHADIC: AN EXPLANATION ........ 195
- Grover Hudson, PARADIGMATIC INITIATION OF A SOUND CHANGE IN HADIYYA ........ 211
- S. Ayotunde Ekundayo, AN ALTERNATIVE TO LEXICAL INSERTION FOR YORUBA COMPLEX NOUNS ........ 233
- K. C. Ford, TONE IN KIKAMBA AND THE CENTRAL KENYA BANTU LANGUAGES ........ 261
- Kent D. Bimson, COMPARATIVE RECONSTRUCTION OF MANDEKAN .... 295

**Volume VIII (1977)**

- Patrick McConvell, RELATIVISATION AND THE ORDERING OF CROSS-REFERENCE RULES IN HAUSA ........ 1
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Francis Katamba</td>
<td>ON META-RULES IN PHONOLOGY</td>
<td>33</td>
</tr>
<tr>
<td>D. Nurse, and G. Philippson</td>
<td>TONES IN OLD MOSHI (CHAGA)</td>
<td>49</td>
</tr>
<tr>
<td>Salikoko S. Mufwene</td>
<td>SOME CONSIDERATIONS ON THE NEW LEXEME BEAU IN LINGALA</td>
<td>81</td>
</tr>
<tr>
<td>Gerard M. Dalgish, and Gloria</td>
<td>PERSONAL PRONUNGS, OBJECT MARKERS, AND SYNTACTIC EVIDENCE IN DHO-LHO</td>
<td>101</td>
</tr>
<tr>
<td>Mirjana Trifiković</td>
<td>TONE PRESERVING VOWEL REDUCTION IN LENDU</td>
<td>121</td>
</tr>
<tr>
<td>John Kalema</td>
<td>ACCENT MODIFICATION RULES IN LUGANDA</td>
<td>127</td>
</tr>
<tr>
<td>Robert K. Herbert</td>
<td>MORPHOPHONOLOGICAL PALATALIZATION IN SOUTHERN BANTU: A REPLY TO</td>
<td>143</td>
</tr>
<tr>
<td></td>
<td>SEGMENTAL FUSION</td>
<td></td>
</tr>
<tr>
<td>Jean-Marie Hombert</td>
<td>CONSONANT TYPES, VOWEL HEIGHT AND TONE IN YORUBA</td>
<td>173</td>
</tr>
<tr>
<td>Malillo Morolong and Larry M.</td>
<td>HYMAN, ANIMACY, OBJECTS AND CLITICS IN SESOTHO</td>
<td>199</td>
</tr>
<tr>
<td>Gerard M. Dalgish, and Gloria</td>
<td>THE JUSTIFICATION FOR LANGUAGE-SPECIFIC SUB-GRAMMATICAL RELATIONS</td>
<td>219</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrick R. Bennett and Jan P.</td>
<td>SOUTHERN NIGER-CONGO: A RECLASSIFICATION</td>
<td>240</td>
</tr>
<tr>
<td>Sterk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paul Newman</td>
<td>CHADIC EXTENSIONS AND PRE-DATIVE VERB FORMS IN HAUSA</td>
<td>275</td>
</tr>
<tr>
<td>Jilali Saib</td>
<td>THE TREATMENT OF GEMINATES: EVIDENCE FROM BERBER</td>
<td>299</td>
</tr>
</tbody>
</table>

**Volume IX (1978)**

**Number 1**

Robert Nicolaï, LES PARLERS SONGHAY OCCIDENTAUX (TOMBOUCTOU - JENNE - NGORKU) | 1

Antoinette Oomen, FOCUS IN THE RENDILLE CLAUSE | 35

**Papers from the 8th Conference on African Linguistics**

Afroasiatic Working Group

Philip Jaggar, 'AND WHAT ABOUT ...?' — TOPICALISATION IN HAUSA | 69
Greta D. Little, WORD ORDER FUNCTION TYPOLOGY: THE AMHARIC CONNECTION ........................................... 83

Bantu Syntax Working Group

Salikoko S. Mufwene, A RECONSIDERATION OF LINGALA TEMPORAL INFLECTIONS ........................................... 91

Susan U. Stucky, LOCATIVE PHRASES AND ALTERNATIVE CONCORD IN TSHILUBA ........................................... 107

Number 2

Okon E. Essien, POSSESSIVE PRONOMINALIZATION AND THE SO-CALLED PICTURE NOUNS IN EFIK ........................................... 121

Robert K. Herbert, ANOTHER LOOK AT META-RULES AND "FAMILY UNIVERSALS" ........................................... 143

David Dwyer, WHAT SORT OF TONE LANGUAGE IS MENDE? ........................................... 167

Papers from the 8th Conference on African Linguistics

Language Planning Working Group

Rachel Angogo, LANGUAGE AND POLITICS IN SOUTH AFRICA ........................................... 211

Al-Amin M. Mazrui, THE RELIGIOUS FACTOR IN LANGUAGE NATIONALISM—THE CASE OF KISWAHILI IN KENYA ........................................... 223

Tshimpaka Yanga, LANGUAGE PLANNING AND ONOMASTICS IN ZAIRE ........................................... 233

Number 3

Russell G. Schuh, BADE/NGIZIM VOWELS AND SYLLABLE STRUCTURES ........................................... 245

Gerard M. Dalgish, INACCESSIBILITY AND DEMOTIONAL NOMINAL MARKING IN IRAQW ........................................... 283

Papers from the 8th Conference on African Linguistics

Working Group on Tone

Alexandre Kimenyi, GRAMMATICAL TONE NEUTRALIZATION IN KINYARWANDA ........................................... 301

Daan Lombard, A DIACHRONIC-TONOLOGICAL ANALYSIS OF CERTAIN RANK SHIFTED VERBAL STRUCTURES IN NORTHERN SOTHO ........................................... 317

Kevin C. Ford and G. N. Clements, DOWNSTEP DISPLACEMENT IN KIKUYU (abstract) ........................................... 327
Supplement VI (1976)

PAPERS IN AFRICAN LINGUISTICS IN HONOR OF WM. E. WELMERS

PREFACE ........................................................................ iv
Leon C. Jacobson, WM. E. WELMERS: A BIOGRAPHICAL SKETCH AND LIST OF PUBLICATIONS ........................................ vii
Eugene W. Bunkowske, WHAT'S A WORD? ............................. 1
Karen Courtenay, IDEOPHONES DEFINED AS A PHONOLOGICAL CLASS: THE CASE OF YORUBA ........................................ 13
David Dwyer, THE ANALYSIS OF BAMBARA POLARIZATION ........ 27
Baruch Elimelech, PLURALIZATION AND NOUN-CLASS REMNANTS IN ETSAKQ ............................................................. 39
Victoria A. Fromkin, A NOTE ON TONE AND THE ABSTRACTNESS CONTROVERSY .............................................................. 47
Isaac George, VERB SERIALIZATION AND LEXICAL DECOMPOSITION...... 63
Talmy Givon, ON THE SOV RECONSTRUCTION OF SOUTHERN NILOTIC: INTERNAL EVIDENCE FROM TOPOSA .................................................. 73
Thomas J. Hinnebusch, SWAHILI: GENETIC AFFILIATIONS AND EVIDENCE ........................................................................ 95
Jean-Marie Hombert, PERCEPTION OF TONES OF BISYLLABIC NOUNS IN YORUBA .............................................................. 109
Larry M. Hyman, D'OU VIENT LE TON HAUT DU BAMILEKE-FE?FE'? ? 123
Charles H. Kraft, AN ETHNOLINGUISTIC STUDY OF HAUSA EPITHETS ........................................................................ 135
Peter Ladefoged, THE STOPS OF OWERRI IGBO ...................... 147
Paul Newman, THE ORIGIN OF HAUSA /h/ ............................ 165
Roxana Ma Newman, THE TWO RELATIVE CONTINUOUS MARKERS IN HAUSA .............................................................. 177
Lynette Nyaggah, ASSOCIATIVE TONE AND SYLLABLE STRUCTURE IN ASANTE TWI .......................................................... 191
J. O. Skip Robinson, HIS AND HERS MORPHOLOGY: THE STRANGE CASE OF TAROK POSSESSIVES .......................... 201

Paul Schachter, AN UNNATURAL CLASS OF CONSONANTS IN SISWATI ............................................. 211

Russell G. Schuh, THE HISTORY OF HAUSA NASALS .......................................................... 233

Herbert Stahlke, THE NOUN PREFIX IN YORUBA .......................................................... 243

Erhard F. K. Voeltz, INALIENABLE POSSESSION IN SOTHO .................................................. 255

Benji Wald, COMPARATIVE NOTES ON PAST TENSES IN KENYAN NORTHEAST BANTU LANGUAGES .......................................................... 267

Supplement VII (1977)

PAPERS FROM THE EIGHTH CONFERENCE ON AFRICAN LINGUISTICS, UCLA, APRIL 1-3, 1977

Saeed Ali and Yero Sylla, PERCEPTUAL TRANSPARENCY AND RELATIVIZATION: A CASE STUDY IN FULA .......................................................... 1

M. Lionel Bender, THE SURMA LANGUAGE GROUP: A PRELIMINARY REPORT .......................................................... 11

Linda Dresel, SOME PHONOLOGICAL ASPECTS OF THE ACQUISITION OF HAUSA .......................................................... 23

Karen H. Ebert, SOME ASPECTS OF THE KERA VERBAL SYSTEM .......................................................... 33

S. A. Ekundayo, LEXICAL NOMINALIZABILITY RESTRICTIONS IN YORUBA .......................................................... 43

Ben Ohi Elugbe, SOME IMPLICATIONS OF LOW TONE RAISING IN SOUTHWESTERN EDO .......................................................... 53

István Fodor, THE USE OF L. MAGYAR'S RECORDS (1859) FOR THE HISTORY OF UMBUNDU .......................................................... 63

Zygmunt Frajzyngier, ON THE INTRANSITIVE COPY PRONOUNS IN CHADIC .......................................................... 73

Judith Olmsted Gary, IMPLICATIONS FOR UNIVERSAL GRAMMAR OF OBJECT-CREATING RULES IN LUYIA AND MASHI .......................................................... 85

Joseph H. Greenberg, NIGER-CONGO NOUN CLASS MARKERS: PREFIXES, SUFFIXES, BOTH OR NEITHER .......................................................... 97
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert K. Herbert</td>
<td>PREFIX RESTRUCTURING, LEXICAL REPRESENTATION, AND THE BANTU NOUN</td>
<td>105</td>
</tr>
<tr>
<td>Kathryn Speed Hodges</td>
<td>CAUSATIVES, TRANSITIVITY AND OBJECTHOOD IN KIMERU</td>
<td>113</td>
</tr>
<tr>
<td>Leon C. Jacobson</td>
<td>PHONETIC ASPECTS OF DHOLUO VOWELS</td>
<td>127</td>
</tr>
<tr>
<td>William R. Leben</td>
<td>LENGTH AND SYLLABLE STRUCTURE IN HAUSA</td>
<td>137</td>
</tr>
<tr>
<td>Carol Lord</td>
<td>HOW IGBO GOT FROM SOV SERIALIZING TO SVO COMPOUNDING</td>
<td>145</td>
</tr>
<tr>
<td>Lynell Marchese</td>
<td>SUBORDINATE CLAUSES AS TOPICS IN GODIE</td>
<td>157</td>
</tr>
<tr>
<td>Ellen Contini Morava</td>
<td>WHAT IS A &quot;NEGATIVE EQUIVALENT&quot;? DATA FROM THE SWAHILI NEGATIVE TENSES</td>
<td>165</td>
</tr>
<tr>
<td>Martin Mould</td>
<td>ON THE PRODUCTIVITY OF DERIVATIONAL MORPHOLOGY AND LEXICAL REPRESENTATION: MANNER ADVERBS IN LUGANDA</td>
<td>175</td>
</tr>
<tr>
<td>Philip A. Noss</td>
<td>COMPOUNDING IN CLOSED PIDGIN TO: THE DYNAMICS OF A CLOSED PIDGIN</td>
<td>185</td>
</tr>
<tr>
<td>Carol Myers Scotton</td>
<td>LINGUISTIC PERFORMANCES AS SUBJECTIVE MEASURES--SOME FINDINGS AND IMPLICATIONS</td>
<td>199</td>
</tr>
<tr>
<td>Philip Sedlak</td>
<td>MIGRATION THEORY, THE NORTHEASTERN COASTAL BANTU AND THE SHUNGWAYA HYPOTHESIS</td>
<td>211</td>
</tr>
<tr>
<td>Mirjana Trifković</td>
<td>TONE SPLITTING: LENDU</td>
<td>223</td>
</tr>
</tbody>
</table>
AUTHOR INDEX

Abasheikh, Mohammad Imam - see Kisseberth and Abasheikh

Saeed Ali and Yero Sylla, PERCEPTUAL TRANSPARENCY AND RELATIVIZATION: A CASE STUDY IN FULA . . . . . . . Supp. 7:1-10

Stephen R. Anderson, ON THE DESCRIPTION OF CONSONANT GRADATION IN FULA . . . . . . . . . . . . . 7:93-136

Rachel Angogo, LANGUAGE AND POLITICS IN SOUTH AFRICA . . 9:211-221

M. Lionel Bender, THE SURMA LANGUAGE GROUP: A PRELIMINARY REPORT . . . . . . . . . . . . . Supp. 7:11-21

Patrick R. Bennett and Jan P. Sterk, SOUTH CENTRAL NIGER-CONGO: A RECLASSIFICATION . . . . . . . 8:240-273

Kent D. Bimson, COMPARATIVE RECONSTRUCTION OF MANDEKAN . . 7:295-354

Eugene W. Bunkowski, WHAT'S A WORD? . . . . . . . . . . . Supp. 6:1-12

Michael Burton and Lorraine Kirk, SEMANTIC REALITY OF BANTU NOUN CLASSES: THE KIKUYU CASE . . . . . . . 7:157-174

Clements, G.N. - see Ford and Clements

John M. Clifton, DOWNDRIPT AND RULE ORDERING . . . . . . 7:175-194


Creider, J. Peter - see Denny and Creider

Gerard M. Dalgish, PERSONAL PRONOUNS, OBJECT MARKERS, AND SYNTACTIC EVIDENCE IN DHO-LUO . . . . . . . 8:101-120

Gerard M. Dalgish, INACCESSIBILITY AND DEMOTIONAL NOMINAL MARKING IN IRAQW . . . . . . . 9:283-297

Gerard M. Dalgish and Gloria Sheintuch, ON THE JUSTIFICATION FOR LANGUAGE-SPECIFIC SUB-GRAMMATICAL RELATIONS . . 8:219-240

J. Peter Denny, and Chet A. Creider, THE SEMANTICS OF NOUN CLASSES IN PROTO-BANTU . . . . . . . . . . . 7:1-30

Linda Dresel, SOME PHONOLOGICAL ASPECTS OF THE ACQUISITION OF HAUSA . . . . . . . . . . . . . Supp. 7:23-31
Dwyer, David J., WHAT SORT OF TONE LANGUAGE IS MENDE? . . . 9:167-209

David J. Dwyer, IDIOSYNCRATIC SUPRASEgmentAL PROCESSES IN MENDE . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9:331-391


Karen H. Ebert, SOME ASPECTS OF THE KERA VERBAL SYSTEM Supp. 7:33-44

S. Ayotunde Ekundayo, AN ALTERNATIVE TO LEXICAL INSERTION FOR YORUBA COMPLEX NOUNS . . . . . . . . . . . . . . . . . 7:233-260

S. A. Ekundayo, LEXICAL NOMINALIZABILITY RESTRICTION IN YORUBA . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Supp. 7:43-51

Baruch Elimelech, PLURALIZATION AND NOUN-CLASS REMNANTS IN ETSAKO . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Supp. 6:39-46

Ben Ohi Elugbe, SOME IMPLICATIONS OF LOW TONE RAISING IN SOUTHWESTERN EDO . . . . . . . . . . . . . . . . . . . . . . . . Supp. 7:53-62

Okon E. Essien, POSSESSIVE PRONOMINALIZATION AND THE SO-CALLED PICTURE NOUNS IN EPIK . . . . . . . . . . . . . . . . . 9:121-142

Istvan Fodor, THE USE OF L. MAGYAR'S RECORDS (1859) FOR THE HISTORY OF UMBUNDU . . . . . . . . . . . . . . . . . Supp. 7:63-71

K. C. Ford, TONE IN KIKAMBA AND THE CENTRAL KENYA BANTU LANGUAGES . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7:261-293

Kevin C. Ford, and G. N. Clements, DOWNSTEP DISPLACEMENT IN KIKUYU (abstract) . . . . . . . . . . . . . . . . . . . . . . . . 9:327-329

Zygmunt Frajzyngier, RULE INVERSION IN CHADIC: AN EXPLANATION . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7:195-210

Zygmunt Frajzyngier, ON THE INTRANSITIVE COPY PRONOUNS IN CHADIC . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Supp. 7:73-84

Victoria A. Fromkin, A NOTE ON TONE AND THE ABSTRACTNESS CONTROVERSY . . . . . . . . . . . . . . . . . . . . . . . . . . . . Supp. 6:47-62

Judith Olmsted Gary, IMPLICATIONS FOR UNIVERSAL GRAMMAR OF OBJECT-CREATING RULES IN LUYIA AND MASHI . . . Supp. 7:85-95

Isaac George, VERB SERIALIZATION AND LEXICAL DECOMPOSITION . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Supp. 6:63-72

Talmy Givón, ON THE SOV RECONSTRUCTION OF SOUTHERN NILOTIC: INTERNAL EVIDENCE FROM TOPOSA . . . . . . . . . . Supp. 6:73-93

Joseph H. Greenberg, NIGER-CONGO NOUN CLASS MARKERS: PREFIXES, SUFFIXES, BOTH OR NEITHER . . . . . . . . . . . . . . Supp. 7:97-104
Robert K. Herbert, MORPHOLOGICAL PALATALIZATION IN SOUTHERN BANTU: A REPLY TO SEGMENTAL FUSION 8:143-171

Robert K. Herbert, ANOTHER LOOK AT META-RULES AND "FAMILY UNIVERSALS" 9:143-165

Robert K. Herbert, PREFIX RESTRUCTURING, LEXICAL REPRESENTATION, AND THE BANTU NOUN Supp. 7:105-111

Thomas J. Hinnebusch, SWAHILI: GENETIC AFFILIATIONS AND EVIDENCE Supp. 6:95-108

Kathryn Speed Hodges, CAUSATIVES, TRANSITIVITY AND OBJECTHOOD IN KIMERU Supp. 7:113-125

Jean-Marie Hombert, CONSONANT TYPES, VOWEL HEIGHT AND TONE IN YORUBA 8:173-190

Jean-Marie Hombert, PERCEPTION OF TONES OF BISYLLABIC NOUNS IN YORUBA Supp. 6:109-121

Grover Hudson, PARADIGMATIC INITIATION OF A SOUND CHANGE IN HADIYYA 7:211-229

Larry M. Hyman, D'OU VIENT LE TON HAUT DU BAMILEKE-FE?FE??. Supp. 6:123-134

Hyman, Larry M. - see Morolong and Hyman

Leon C. Jacobson, WM. E. WELMERS: A BIOGRAPHICAL SKETCH AND LIST OF PUBLICATIONS Supp. 6:vii-xv

Leon C. Jacobson, PHONETIC ASPECTS OF DHOLUO VOWELS Supp. 7:127-135

Philip Jaggar, 'AND WHAT ABOUT ...?' — TOPICALISATION IN HAUSA 9:69-81

John Kalema, ACCENT MODIFICATION RULES IN LUGANDA 8:127-141

Francis Katamba, ON META-RULES IN PHONOLOGY 8:33-47

Alexandre Kimenyi, GRAMMATICAL TONE NEUTRALIZATION IN KINYARWANDA 9:301-315

Kirk, Lorraine — see Burton and Kirk

Charles W. Kisseberth and Mohammad Imam Abasheikh, ON THE INTERACTION OF PHONOLOGY AND MORPHOLOGY: A CHI-MWI:NI EXAMPLE 7:31-40

Charles H. Kraft, AN ETHNOLINGUISTIC STUDY OF HAUSA EPITHETS Supp. 6:135-146
Peter Ladefoged, THE STOPS OF OWERRI IGBO ... Supp. 6:147-163

William R. Leben, LENGTH AND SYLLABLE STRUCTURE IN HAUSA ... Supp. 7:137-143

Greta D. Little, WORD ORDER FUNCTION TYPOLOGY: THE AMHARIC CONNECTION ... 9:83-90

Dean Lombard, A DIACHRONIC-TONOLOGICAL ANALYSIS OF CERTAIN RANKhiftED VERBAL STRUCTURES IN NORTHERN SOTHO ... 9:317-326

Carol Lord, HOW IGBO GOT FROM SOV SERIALIZING TO SVO COMPOUNDING ... Supp. 7:145-155

Patrick McConvell, RELATIVISATION AND THE ORDERING OF CROSS-REFERENCE RULES IN HAUSA ... 8:1-31

Lynell Marchese, SUBORDINATE CLAUSES AS TOPICS IN GODIE ... Supp. 7:157-164

Al-Amin M. Mazrui, THE RELIGIOUS FACTOR IN LANGUAGE NATIONALISM—THE CASE OF KISWAHILI IN KENYA ... 9:223-231

Ellen Contini Morava, STATISTICAL DEMONSTRATION OF A MEANING: THE SWAHILI LOCATIVES IN EXISTENTIAL ASSERTIONS ... 7:137-156

Ellen Contini Morava, WHAT IS A "NEGATIVE EQUIVALENT"? DATA FROM THE SWAHILI NEGATIVE TENSES ... Supp. 7:165-173

Malillo Morolong, and Larry M. Hyman, ANIMACY, OBJECTS AND CLITICS IN SESOTHO ... 8:199-218

Martin Mould, ON THE PRODUCTIVITY OF DERIVATIONAL MORPHOLOGY AND LEXICAL REPRESENTATION: MANNER ADVERBS IN LUGANDA ... Supp. 7:175-183

Salikoko S. Mufwene, SOME CONSIDERATIONS ON THE NEW LEXEME BEAU IN LINGALA ... 8:81-94

Salikoko S. Mufwene, A RECONSIDERATION OF LINGALA TEMPORAL INFLECTIONS ... 9:91-105

Paul Newman, CHADIC EXTENSIONS AND PRE-DATIVE VERB FORMS IN HAUSA ... 8:275-297

Paul Newman, THE ORIGIN OF HAUSA /h/ ... Supp. 6:165-175

Roxana Ma Newman, THE TWO RELATIVE CONTINUOUS MARKERS IN HAUSA ... Supp. 6:177-190

Robert Nicolaï, LES PARLERS SONGHAY OCCIDENTAUX (TOMBOUCTOU - JENNÉ - NGORKU) ... 9:1-34
Philip A. Noss, COMPOUNDING IN TO: THE DYNAMICS OF A CLOSED PIDGIN .......... Supp. 7:185-197

D. Nurse, and G. Philippson, TONES IN OLD MOSHI (CHAGA) ... 8:49-80

Lynette Nyaggah, ASSOCIATIVE TONE AND SYLLABLE STRUCTURE IN ASANTE TWI ........ Supp. 6:191-199

Antoinette Oomen, FOCUS IN THE RENDILLE CLAUSE ........ 9:35-67

Philipsson, G. – see Nurse and Philippson

J. O. Skip Robinson, HIS AND HERS MORPHOLOGY: THE STRANGE CASE OF TAROK POSSESSIVES ........ Supp. 6:201-209

Jilali Saib, THE TREATMENT OF GEMINATES: EVIDENCE FROM BERBER ................. 8:299-316

Paul Schachter, AN UNNATURAL CLASS OF CONSONANTS IN SISWATI .................. Supp. 6:211-220

Russell G. Schuh, BADE/NGIZIM VOWELS AND SYLLABLE STRUCTURE ............... 9:245-281


Carol Myers Scotton, LINGUISTIC PERFORMANCES AS SUBJECTIVE MEASURES—SOME FINDINGS AND IMPLICATIONS ........ Supp. 7:199-210


Sheintuch, Gloria – see Dalgish and Sheintuch

Raymond O. Silverstein, A STRATEGY FOR UTTERANCE PRODUCTION IN HAUSA ........ Supp. 6:233-241

Herbert F. W. Stahlke, SEGMENT SEQUENCES AND SEGMENTAL FUSION ................. 7:41-63

Herbert Stahlke, THE NOUN PREFIX IN YORUBA ................. Supp. 6:243-253

Sterk, Patrick R. – Bennett and Sterk

Susan U. Stucky, LOCATIVE PHRASES AND ALTERNATIVE CONCORD IN TSHIWBA ........... 9:107-119

Sylla, Yero – Ali and Sylla

Mirjana Trifković, TONE PRESERVING VOWEL REDUCTION IN LENDU ................. 8:121-125
Mirjana Trifković, TONE SPLITTING: LENDU . . . . . . . . . . Supp. 7: 233-234
Erhard F. K. Voeltz, INALIENABLE POSSESSION IN SOTHO . . Supp. 6:255-266
Benji Wald, COMPARATIVE NOTES ON PAST TENSES IN KENyan NORTHEAST BANTU LANGUAGES . . . . . . . . . . Supp. 6:267-281
Robert W. Wilkinson, CONTRAST PRESERVATION IN YORUBA . . 7:65-92
Tshimpaka Yanga, LANGUAGE PLANNING AND ONOMASTICS IN ZAIRE . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9:233-244
LANGUAGE INDEX

ABANYOM:  Supp. 6:245 (Stahlke)
ABUA:  8:241-74 (Bennett and Sterk)
ADAMAWA:  Supp. 7:97 (Greenberg), Supp. 7:186 (Noss)
ADAMAWA-EASTERN:  8:246, 248-50, 252, 262 (Bennett and Sterk),
                     Supp. 7:97 (Greenberg)
ADELE:  8:254 (Bennett and Sterk)
ADJUKRU:  8:253, 255 (Bennett and Sterk)
AFAR-SARO:  Supp. 7:19 (Bender)
AFRIKAANS:  9:211-221 (Angogo)
AFROASIATIC:  Supp. 6:166, 170-172 (Newman), Supp. 7:19 (Bender)
AFUSARE:  8:241-74 (Bennett and Sterk)
AHLÔ:  8:251 (Bennett and Sterk)
AKAN:  8:255 (Bennett and Sterk), Supp. 6:39 (Elimelech), Supp. 6:50-51,
      58-59 (Fromkin), Supp. 6:195 (Nyaggah), Supp. 7:147-148 (Lord)
AKASELE:  Supp. 7:98 (Greenberg)
AKUAPIM:  Supp. 6:196 (Nyaggah)
          [see also AKAN]
ALEGE:  8:260-1 (Bennett and Sterk)
ALGONQUIAN:  7:13 (Denny and Creider)
AMHARIC:  7:214, 216, 227-8 (Hudson), 9:83-90 (Little), Supp. 7:15
           (Bender)
ANGAS:  9:71 (Jaggar)
ANYWA:  Supp. 7:17 (Bender)
ARABIC:  7:227 (Hudson), 8:307 (Saib), 9:37 (Domen), 9:224-225,
        227-230 (Mazrui), Supp. 6:167 (Newman), Supp. 7:2 (Ali and
        Sylla), Supp. 7:29 (Dresel)
ARI:  Supp. 7:20 (Bender)
ARMENIAN:  Supp. 6:162 (Ladefoged et al.)
ASANTE:  8:241-274 (Bennett and Sterk), Supp. 6:191-197 (Nyaggah)
        [see also TWI]
ASU:  Supp. 6:96 (Hinnebusch)
ATTEN:  8:241-74 (Bennett and Sterk)
ATHAPASKAN:  7:9, 13, 16 (Denny and Creider)
AUSTRONESIAN: 7:112-3 (Anderson)

AVATIME: Supp. 7:100 (Greenberg)

AVIKAM: 8:255 (Bennett and Sterk)

BACHAMA: 8:277, 280-1 (Newman)

BADE: 8:182 (Hombert), 8:279 (Newman), 9:247-283 (Schuh), Supp. 7:38 (Ebert)

BAGIRMI: Supp. 7:17 (Bender)

BAJUNI: Supp. 6:277-280 (Wald)

BALE: Supp. 7:12, 17-18

BALEP: Supp. 7:245 (Stahlke)

BAMBARA: 7:43-44 (Stahlke), 7:297, 298-316, 335 (Bimson), 9:188-189 (Dwyer), Supp. 6:13 (Courtenay), Supp. 6:27-38 (Dwyer), Supp. 6:192, 194 (Nyaggah), Supp. 6:255 (Voeltz)

BAMILEKE (FE?FE?): Supp. 6:123-134 (Hyman), Supp. 7:147-148 (Lord)

BAMILEKE (Other Dialects): Supp. 6:125-126, 128-130 (Hyman)

BAMOU: Supp. 6:123, 128 (Hyman)

BANLI: 9:185-186, 204-206 (Dwyer), 9:338-339 (Dwyer)


BANTU (PROTO-): 7:1-30 (Denny and Creider), 8:34, 36, 43, 45 (Katamba), 8:49, 52 (Nurse and Phillipson), 9:147-148, 151, 154 (Herbert), Supp. 6:124 (Hyman), Supp. 6:246 (Stahlke), Supp. 7:68-69 (Fodor), Supp. 7:150 (Lord)

BARI: 8:99 (Givón)

BASHAR: Supp. 6:201 (Robinson)

BEMBA (see CHIBEMBA)
BENA: Supp. 6:96 (Hinnebusch)
BENDI: 8:260 (Bennett and Sterk)
BENDEGHE: Supp. 6:245 (Stahlke)
BENUE-CONGO: 8:241-74 (Bennett and Sterk), Supp. 6:202, 207 (Robinson), Supp. 6:243, 246 (Stahlke), Supp. 7:97, 100 (Greenberg)
BENUE-CONGO (PROTO-): Supp. 6:202 (Robinson), Supp. 6:246 (Stahlke)
BENUE-KWA: 8:241 (Bennett and Sterk), Supp. 7:145-146, 148, 150 (Lord)
BENUE-KWA (PROTO-): Supp. 6:246 (Stahlke)
BERBER: 8:299-316 (Saib)
BERTA: Supp. 7:17 (Bender)
BINI: 8:241-74 (Bennett and Sterk), Supp. 7:58-59 (Elugbe)
BO: 7:297, 316-339 (Bimson)
BOBANGI: 8:241-74 (Bennett and Sterk)
BODI: Supp. 7:13-18 (Bender)
[see also ME'ENJ
BOKI: 8:260 (Bennett and Sterk)
BOLANGI (*BOLE): 8:275, 278, 282-5, 292 (Newman), Supp. 6:171 (Newman), Supp. 7:73, 79-80 (Frajzyngier)
BONDEI: Supp. 6:95, 96 (Hinnebusch)
BONI: 9:35 (Oomen)
BOYA: Supp. 7:11 (Bender)
BRAVANESE: see CIMIINI
BRONG: Supp. 6:194-195 (Nyaggah)
BURA: 8:287 (Newman)
BURJI: 7:212, 216 (Hudson)
BURMESE: 7:13-17 (Denny and Creider)
BURUN: Supp. 7:20 (Bender)
BUSHMAN: 9:159, 162 (Herbert)
BUTE: 8:261 (Bennet and Sterk)
CADDOD: Supp. 7:163 (Marchese)
CELTIC: 7:99-100 (Anderson)
CHADIC: 7:195-210 (Frajzyngier), 8:275-297 (Newman), 9:69, 71, 80 (Jaggar), Supp. 6:166-173 (Newman), Supp. 7:33, 36, 38, 40-41 (Ebert), Supp. 7:73-84 (Frajzyngier), Supp. 7:103 (Greenberg)
CHADIC (PROTO-): 8:275-297 (Newman), Supp. 6:165-166, 170-171, 173 (Newman), Supp. 7:29 (Dresel), Supp. 7:35-36, 40-41 (Ebert)

CHAGA: 8:49-80 (Nurse and Philippson), Supp. 6:98 (Hinnebusch), Supp. 7:212 (Sedlak)

CHIBEMBA: 8:230 (Dalgish and Sheintuch), 9:108 (Stucky)

CHICHÉWA: 8:241-274 (Bennett and Sterk), Supp. 7:93 (Gary)

CHIWINGI: 7:31-40 (Kisseberth and Abasheikh), 8:231 (Dalgish and Sheintuch)

CHINESE: 8:182 (Hombert), 9:83 (Little), 9:162 (Herbert), 9:168 (Dwyer), Supp. 6:52-53 (Fromkin)

CHONYI: Supp. 6: 96, 101-103, 105-106 (Hinnebusch)

CHUPI: 8:153-157 (Herbert)

CHORI: 8:241-274 (Bennett and Sterk)

CIMIINI: Supp. 7:217 (Sedlak)

CUSHITIC: 9:35, 37 (Oomen), Supp. 7:19-20 (Bender)

CZECH: Supp. 7:2 (Ali and Sylla)

DABA: 8:282, 286 (Newman)

DÁBIDA: 8:49 (Nurse and Philippson), Supp. 6:96-98, 101-102 (Hinnebusch), Supp. 6:269, 273-274, 277 (Wald), Supp. 7:212 (Sedlak)

DAJU: Supp. 7:17 (Bender)

DAKARKARI: 8:259 (Bennett and Sterk)

DANGLA: Supp. 6:172 (Newman)

DARADA: 7:212, 216 (Hudson)

DASENECH: Supp. 7:19 (Bender)

DCIRIKU: Supp. 7:68-69 (Fodor)

DEGEMA: 8:241-74 (Bennett and Sterk)

DENSI: 9:1 (Nicolai)

DHO-LUO: 8:99 (Givon), 8:101-120 (Dalgish), 9:299 (Dalgish), Supp. 6:73, 89 (Givon), Supp. 7:127-135 (Jacobson)

DIAKHANKA: 7:297, 310, 316-339 (Bimson)

DIDINGA: see MURLE

DIGO: Supp. 6:95-96, 98, 101-106 (Hinnebusch), Supp. 6:269-272, 275-276 (Wald), Supp. 7:211-212 (Sedlak)

DINKA: Supp. 6:89 (Givon)
DIZI: Supp. 7:19 (Bender)
DOE: Supp. 6:95, 99, 108 (Hinnebusch)
DURUMA: Supp. 6:96, 101-104 (Hinnebusch)
DUTCH: 9:218 (Angogo)
DUWAI: 9:249 (Schuh)
DYOLA: 8:241-274 (Bennett and Sterk), Supp. 7:99 (Greenberg)
DYULA: 7:297, 298-316 (Bimson)
DZAMBA: Supp. 7:101 (Greenberg)
EDO: 8:252, 262, 263 (Bennett and Sterk), Supp. 7:53-62 (Elugbe)
EFIK: 8:241-274 (Bennett and Sterk), 9:121-142 (Essien)
EFUTOP: Supp. 6:245, 246 (Stahlke)
EGYPTIAN: Supp. 6:172-173 (Newman)
EKAJUK: Supp. 6:245 (Stahlke)
EKOI: 8:251 (Bennett and Sterk)
EKOID BANTU: Supp. 6:245-246 (Stahlke)
EKPARABONG: Supp. 6:245 (Stahlke)
EKPEYE: Supp. 6:155 (Ladefoged et al.)
ELOYI: 8:241-74 (Bennett and Sterk)
ERRUWA: Supp. 7:53 (Elugbe)
ETSAKQ: Supp. 6:39-46 (Elimelech)
ETUNG: Supp. 6:245 (Stahlke)
EWE: 7:289 (Ford), 8:241-274 (Bennett and Sterk), Supp. 6:67 (George), Supp. 6:137 (Hyman)

FANAGALO: 9:217 (Angogo)

FANTE: Supp. 6:194 (Nyaggah)
[see also AKAN]

FE?FE?: see BAMILEKE

FINNISH: Supp. 7:2 (Ali and Sylla)

FRENCH: 7:45-6, 57-9 (Stahlke), 7:191 (Clifton), 8:81, 83-90, 92 (Mufwene), 8:149 (Herbert), 8:313-4 (Saib), 9:240-241 (Yanga), Supp. 7:98-100, 102 (Greenberg), Supp. 7:146 (Lord), Supp. 7:195 (Noss)

FULA: 7:93-136 (Anderson), 8:241-274 (Bennet and Sterk), Supp. 7:1-10 (Ali and Sylla), Supp. 7:100 (Greenberg)

GĀ: 8:241-273 (Bennett and Sterk)


GADE: 8:241-74 (Bennett and Sterk)

GALLA: Supp. 7:211 (Sedlak)

GANDA: see LUGANDA

GANGAM: Supp. 7:98-99 (Greenberg)

GARO: 7:9 (Denny and Creider)

GBAYA: 8:241-74 (Bennett and Sterk), Supp. 7:186, 194 (Noss)

GBEYA: Supp. 6:13 (Courtenay)

GERA: Supp. 6:171 (Newman)

GERMAN: 9:203 (Dwyer), 9:212 (Angogo), Supp. 6:262 (Voeltz), Supp. 7:2 (Ali and Sylla)

GERMANIC: 9:156-158 (Herbert), Supp. 6:83 (Givón)

GIKUYU: see KIKUYU

GILBERTESSE: Supp. 7:2 (Ali and Sylla)

GIRYAMA: Supp. 6:95-97, 100-106 (Hinnebusch), Supp. 6:269, 271-272, 275-277 (Wald)

GISIGA: 8:277, 279-80, 283 (Newman)

GITONGA: see TONGA

GODIE: Supp. 7:157-164 (Marchese)

GOTHIC: Supp. 6:84 (Givón)

GREBO: 8:241-274 (Bennett and Sterk)

GREEK: 7:54-5 (Stahlke), 9:54 (Omen), 9:212 (Angogo)
GUAYKURUAN: 7:13 (Stahlke)
GOGO: Supp. 6:96, 99, 108 (Hinnebusch)
GOLA: Supp. 7:101 (Greenberg)
GUDE: 9:71 (Jaggar)
GUJARATI: 9:212 (Angogo)
GUMUZ: Supp. 7:17 (Bender)
GUR: 8:246-50, 253-4, 259, 262 (Bennett and Sterk)
GURMA: Supp. 7:98-99, 101-102 (Greenberg)
GUSII: 8:68 (Nurse and Philipsson)
GWANDARA: Supp. 6:170 (Newman)
GWARI: 8:241-74 (Bennett and Sterk)
HADIYYA: 7:211-229 (Hudson)
HAMER: Supp. 7:13 (Bender)
HAUSA: 7:124-5 (Anderson), 7:204, 209 (Frajzyngier), 8:1-31 (McConevall), 8:182 (Hombert), 8:275-97 (Newman), 9:69-81 (Jaggar), 9:266-268, 277 (Schuh), Supp. 6:49-50, 54, 56 (Fromkin), Supp. 6:135-146 (Kraft), Supp. 6:165-175 (Newman), Supp. 6:177-190 (Newman), Supp. 6:201 (Robinson), Supp. 6:221-232 (Schuh), Supp. 6:233-241 (Silverstein), Supp. 7:23-31 (Dresel), Supp. 7:77, 82-83 (Frajzyngier), Supp. 7:103-104 (Greenberg), Supp. 7:137-143 (Leben)
HAYA: 8:128 (Kalema), 8:206 (Morolong and Hyman), Supp. 7:93 (Gary)
HEBREW: 8:310, 313 (Saib), Supp. 7:1-2, 5 (Ali and Sylla)
HEHE: Supp. 6:96 (Hinnebusch)
HERERO: Supp. 7:68 (Fodor), Supp. 7:101 (Greenberg)
HINDI: 9:212 (Angogo), 9:223 (Mazrui), Supp. 6:82 (Givón), Supp. 6:158 (Ladefoged et al.), Supp. 7:11 (Bender)
HOPI: 7:159, 161 (Burton and Kirk)
HOTTENTOT: 9:162 (Herbert)
HUNGARIAN: 7:62 (Stahlke), Supp. 7:64, 66 (Fodor)
HUNGU: Supp. 7:107 (Herbert)
HWELA: 7:296, 297, 298, 321 (Bimson)
IDOMA: 8:241-274 (Bennett and Sterk)
IFE (TOGO): 8:241-74 (Bennett and Sterk)
IGALA: 8:241-74 (Bennett and Sterk)
IGBIRRA: 8:241-74 (Bennett and Sterk)

IGEDE: 8:258 (Bennett and Sterk)

IJO: 7:59 (Stahlke), 8:241-74 (Bennett and Sterk), Supp. 6:25 (Courtenay), Supp. 7:145, 147, 153-154 (Lord)

IMO: 8:250 (Bennett and Sterk)

INDO-ARYAN: Supp. 6:158, 162 (Ladefoged et al.)

INDO-EUROPEAN: 7:60-1 (Stahlke), 7:157 (Burton and Kirk), 9:104 (Mufwene), Supp. 6:75-76, 79, 86 (Givón), Supp. 6:162 (Ladefoged et al.)

INDONESIAN: 7:113 (Anderson)

IRAQW: 9:285-299 (Dalgish)

IROQUOIAN: Supp. 6:79 (Givón)

ISOKO: 8:241-74 (Bennett and Sterk), Supp. 7:53-62 (Elugbe)

ITALIAN: 7:161 (Burton and Kirk), Supp. 7:102 (Greenberg)

JABARTI: 9:35 (Oomen)

JAPANESE: 7:43-44 (Stahlke)

JARAWA: 8:241-74 (Bennett and Sterk)

JIBANA: Supp. 6:96 (Hinnebusch), Supp. 6:272 (Wald)

JUKUN: 8:241-74 (Bennett and Sterk)

KAGULU: Supp. 6:96, 99 (Hinnebusch)

KAJE: 8:241:74 (Bennett and Sterk)

KAMBA: 8:49, 68 (Nurse and Philipppson), Supp. 6:267-274 (Wald), Supp. 7:216 (Sedlak)

KAMBARI: 8:241-74 (Bennett and Sterk).

KAMBARA: 7:212-4, 216, 226 (Hudson)

KAMBE: Supp. 6:96 (Hinnebusch)

KAMI: Supp. 6:95, 99, 108 (Hinnebusch)

KANAKURU: 7:195-203, 205-9 (Frajzyngier), 9:71, 75 (Jaggar), Supp. 6:170 (Newman), Supp. 6:221, 223 (Schuh), Supp. 7:73-74, 78, 83 (Frajzyngier)

KANURI: 9:275, 277 (Schuh), Supp. 6:222-223 (Schuh), Supp. 7:17 (Bender)

KAPSIDI: Supp. 7:79 (Frajzyngier)

KARE: Supp. 7:186 (Noss)

KAREKARE: 9:267 (Schuh), Supp. 6:221, 231 (Schuh)
KASHUR:  Supp. 7:211 (Sedlak)
KASSENE:  8:241-74 (Bennett and Sterk)
KAUMA:  Supp. 6:96 (Hinnebusch)
KEBU:  Supp. 7:100 (Greenberg)
KERA:  Supp. 7:33-41 (Ebert)
KHOISAN:  9:158-160 (Herbert)
KIEMBU:  Supp. 6:191 (Nyaggah)
KIKAMBA:  7:261-293 (Ford)
KIKONGO:  9:235-237 (Yanga)
KIMERU:  8:231 (Dalgish and Sheintuch), Supp. 7:113-125 (Hodges)
KINGA:  8:128 (Kalema)
KINYARWANDA:  8:128 (Kalema), 8:216 (Morolong and Hyman), 8:230 (Dalgish and Sheintuch), 9:303-317 (Kimenyi), Supp. 7:86-87, 91, 93-94 (Gary)
KIRFI:  9:267 (Schuh)
KIYANZI:  9:157 (Herbert)
KITUBA:  8:83, 85 (Mufwene)
KLAO:  see KRU
KOFYAR:  Supp. 6:229 (Schuh)
KONDE:  9:323 (Lombard)
KONIKE:  Supp. 7:101 (Greenberg)
KO NO:  7:296, 297, 356 (Bimson)
KONYANKA:  7:297, 316-39 (Bimson)
KORDOFANIAN:  8:246-47, 253, 263 (Bennett and Sterk)
KOTO:  8:251 (Bennett and Sterk)
KOTOKO:  Supp. 7:38 (Ebert)
KPELLE:  9:172, 186-187, 189-190 (Dwyer), 9:338-339 (Dwyer), Supp. 6:31 (Dwyer)
KRU:  8:248-54, 262 (Bennett and Sterk), Supp. 6:56-57 (Fromkin), Supp. 7:146-147 (Lord), Supp. 7:163 (Marchese)
KULERE:  8:278 (Newman)
KUNAMA: Supp. 7:17 (Bender)

KURANKO: 7:296, 297, 305, 323, 333, 334, 335, 336, 346 (Bimson)

KUTU: Supp. 6:95, 99, 108 (Hinnebusch)

KWA: 8:241-74 (Bennett and Sterk), 9:281 (Schuh), Supp. 6:39 (Elimelech), Supp. 6:63, 66 (George), Supp. 6:246 (Stahlke), Supp. 7:53, 58-59 (Elugbe), Supp. 7:97, 100 (Greenberg), Supp. 7:153 (Lord)

KWA (PROTO-): Supp. 6:194-195 (Nyaggah)

KWANYAMA: 8:241-74 (Bennett and Sterk)

KWEGU: Supp. 7:13, 18-19 (Bender)

KWERE: Supp. 6:95, 99, 108 (Hinnebusch)

LAME: Supp. 7:38 (Ebert)

LARTEH: 8:241-74 (Bennett and Sterk)

LATIN: 7:54-55, 61 (Stahlke), 8:313-15 (Saib), 9:54 (Oomen), Supp. 7:99, 102 (Greenberg)

LELEMI: 8:241-74 (Bennet and Sterk)

LENGU: 8:121-25 (Trifković), Supp. 7:223-234 (Trifković)

LIGBI: 7:296, 297, 298, 304, 322, 324, 346 (Bimson)

LIMBA: Supp. 7:100 (Greenberg)

LIMBOUN: Supp. 6:123-24 (Hyman)

LINGALA: 8:81-94 (Mufwene), 9:91-105 (Mufwene)

LOGOOLI: 8:205, 213, 216 (Morolong and Hymna)

LOKO: 9:186, 205 (Dwyer), 9:338-39 (Dwyer)

LOMA: 9:186 (Dwyer), 9:338 (Dwyer), Supp. 7:103 (Greenberg)

LONGARIM: see BOYA

LONGUDA: 8:249 (Bennett and Sterk)

LUGANDA: 8:33-47 (Katamba), 8:127-41 (Kalema), 9:143-165 (Herbert), Supp. 6:270, 275 (Wald), Supp. 7:68 (Fodor), Supp. 7:106-107 (Herbert), Supp. 7:175-183 (Mould), Supp. 7:202 (Scotton)

LUGULU: Supp. 6:95, 98-99, 108 (Hinnebusch)

LUMASAABA: 8:36 (Katamba), 9:144-145, 151 (Herbert)

LUO: see DHO-LUO

LUYIA: Supp. 7:202 (Scotton)

LUYIA (MARAGOLI): Supp. 7:85-95 (Gary)

LUYIA (OLUTSOOTSO): 8:219-40 (Dalgish and Sheintuch), 9:108, 118 (Stucky)
MAASAI:  7:262, 287-89 (Ford), Supp. 6:88-89 (Givon)
MABA:  Supp. 7:17 (Bender)
MAJANG:  Supp. 7:13-20 (Bender)
MAKONDE:  Supp. 7:108-109 (Herbert)
MAKUA:  Supp. 7:109 (Herbert)
MALAGASY:  Supp. 7:2 (Ali and Sylla)
MALAY:  7:113 (Anderson), 9:218 (Angogo)
MALAYO-POLYNESIAN:  7:13 (Denny and Creider), Supp. 7:217 (Sedlak)
MAMBILA:  8:241-74 (Bennett and Sterk)
MAMPRUSSI:  8:241-74 (Bennett and Sterk)
MANDE:  8:246-47, 249-50, 252-53, 263 (Bennett and Sterk), 9:172, 186-91, 193, 204-205 (Dwyer), 9:281 (Schuh), 9:339 (Dwyer), Supp. 6:27, 30, 36, 38 (Dwyer), Supp. 7:97, 103 (Greenberg)
PROTO-MANDE:  9:172, 178, 185-192 (Dwyer), 9:333, 338-39 (Dwyer)
MANDEKAN:  7:295-351 (Bimson)
MANDEKAN (PROTO-):  7:295-351 (Bimson)
MANDINKA:  7:297 (Bimson)
MANINKA:  7:297, 298-316 (Bimson)
MANJAKU:  7:96-97 (Anderson)
MANKON:  Supp. 6:123, 128, 131 (Hyman)
MANYA:  Supp. 6:36-37 (Dwyer)
MARGI:  8:275, 282, 287 (Newman), Supp. 7:79, 82 (Frajzyngier)
MASA:  Supp. 6:172 (Newman)
MAWI:  Supp. 7:85-95 (Gary)
MAUKA:  7:297, 316-339 (Bimson)
MAYAN:  7:13, 17 (Denny and Creider)
MawiHA:  Supp. 7:109 (Herbert)
MBAM-NKAM:  Supp. 6:123-127, 131 (Hyman)
M'BEMBE:  8:251 (Bennett and Sterk)
MBUM:  Supp. 7:186, 189-190 (Noss)
ME'EN:  Supp. 7:13 (Bender)
MEHRI:  Supp. 6:172-173 (Newman)
MEKEYIR:  Supp. 7:13-14, 18 (Bender)
MEND:  7:44-45 (Stahlke), 9:167-208 (Dwyer), 9:333-343 (Dwyer), Supp. 6:54, 56 (Fromkin)
MERARIT: Supp. 7:17 (Bender)


MIYA: Supp. 6:221 (Schuh)

MOBA: Supp. 7:98 (Greenberg)

MONDUNGA: Supp. 7:101 (Greenberg)

MONGOLIAN: 7:45 (Stahlke)

MORE: 8:249 (Bennett and Sterk)

MOSSI: 8:241-74 (Bennett and Sterk)

MUGUJI: Supp. 7:13, 15-19 (Bender)

MURLE: Supp. 7:11-19 (Bender)

MURSI: Supp. 7:13-18 (Bender)

MUZGU: Supp. 6:221-222 (Schuh)

NAHUATL: 9:161 (Herbert)

NANDI: 8:99 (Givón), Supp. 6:73, 89 (Givón)

NAVAHO: 7:9 (Denny and Creider), 7:159, 160, 161-2 (Burton and Kirk)

NDE: Supp. 6:245-246 (Stahlke)

NDEBELE: 9:161 (Herbert), 9:212 (Angogo)

NDOGO: 8:241-74 (Bennett and Sterk)

NEWOLE: 8:241-74 (Bennett and Sterk)

NGANGAM: Supp. 7:99 (Greenberg)

NGEMBA: Supp. 6:123-124, 128 (Hyman)

NGIZIM: 8:182 (Hombert), 8:277-279, 282, 83 (Newman), 9:71, 75 (Jaggar), 9:247-283 (Schuh), Supp. 6:167-170 (Newman), Supp. 6:221-222, 229, 231 (Schuh), Supp. 7:38 (Ebert), Supp. 7:73, 79-81 (Frajzyngier)

NGULU: Supp. 6:95 (Hinnebusch)

NGUNI: 8:158, 160, 164-65 (Herbert), 9:159-161 (Herbert), 9:212, 217 (Angogo), Supp. 6:14 (Courtenay)
[see also NDEBELE, SWAZI, XHOSA, and ZULU]

NHWELE: see KWERE

NIGER-CONGO: 8:241-74 (Bennett and Sterk), Supp. 6:38 (Dwyer), Supp. 6:66 (George), Supp. 6:79, 86 (Givón), Supp. 6:191 (Nyaggah), Supp. 6:202 (Robinson), Supp. 7:58 (Elugbe), Supp. 7:97-104 (Greenberg), Supp. 7:145-146, 154 (Lord)

NIGER-CONGO (PROTO-): Supp. 6:39-40, 45 (Elimelech), Supp. 7:97, 102 (Greenberg)
NIGER-KADUNA: 8:244, 253, 257-60 (Bennett and Sterk)

NIGER-KORDOFANIAN: 7:295 (Bimson), 8:241-42, 246-47 (Bennett and Sterk), Supp. 6:243 (Stahlke), Supp. 7:97, 103-104 (Greenberg)

NIGER-KORDOFANIAN (PROTO-): Supp. 6:245 (Stahlke), Supp. 7:102 (Greenberg)

NILO-SAHARAN: Supp. 6:73 (Givón), Supp. 7:11, 20 (Bender)

NILOTIC: Supp. 6:73-93 (Givón), Supp. 7:16, 19 (Bender)

NKIM: Supp. 6:245 (Stahlke)

NKUMM: Supp. 6:245 (Stahlke)

NNAM: Supp. 6:245-246 (Stahlke)

NONI: Suppl. 6:131 (Hyman)

NSELLE: Supp. 6:245 (Stahlke)

NTA: Supp. 6:245 (Stahlke)

NUER: 9:235 (Yanga), Supp. 6:89 (Givón), Supp. 7:17 (Bender)

NUMU: 7:296, 297, 298 (Bimson)

NUPE: 8:241-74 (Bennett and Sterk), Supp. 6:52, 54-55 (Fromkin), Supp. 6:63-72 (George), Supp. 6:192 (Nyaggah), Supp. 7:147-149 (Lord)

NYAKYUSA: 8:206 (Morolong and Hyman)

NYANJA: see CHICHEWA

NYIKA: Supp. 6:95-96 (Hinnebusch)

OGONI: 8:241-74 (Bennett and Sterk)

OJIBWAY: 7:13-17 (Denny and Creider)

OKPE: Supp. 7:53 (Elugbe)

OLAM: Supp. 7:12-13, 17-19 (Bender)

OLD MOSHI: see CHAGA

OLU LUYIA: 8:103 (Dalgish)

OMETO: Supp. 7:19 (Bender)

OMO MURLE: Supp. 7:13, 18 (Bender)

OMOTIC: Supp. 7:19-20 (Bender)

ORA: 8:241-74 (Bennett and Sterk)

OVAMBO: Supp. 7:101 (Greenberg)

PA'A: Supp. 6:229, 231 (Schuh)

PAI: Supp. 6:201 (Robinson)
PALI: 7:61-62 (Stahlke)
PANA: Supp. 7:186, 189 (Noss)
PAPAGO: 7:159 (Burton and Kirk)
PARE: 8:49 (Nurse and Phillipson), Supp. 6:95 (Hinnebusch), Supp. 6:273-74 (Wald), Supp. 7:212 (Sedlak)
PASHTO: 8:119 (Dalgish)
PEDI: 8:148-52, 160 (Herbert), 9:159-60 (Herbert), 9:212 (Angogo), 9:319-28 (Lombard)
PERO: 7:195, 203-204, 205 (Frajzyngier), 8:278, 282, 284-85 (Newman), Supp. 7:74-77, 83 (Frajzyngier)
PERSIAN: Supp. 7:2 (Ali and Sylla)
PHILLIPINE: 7:112-13 (Anderson)
POGOLO: Supp. 6:96 (Hinnebusch)
POKOMO: Supp. 6:95-96, 98-106, 108 (Hinnebusch), Supp. 7:211-12, 216-17, 219 (Sedlak)
PORTUGUESE: 8:83 (Mufwene), 9:212 (Angogo), Supp. 7:67 (Fodor), Supp. 7:109 (Herbert)
RABAI: Supp. 6:96 (Hinnebusch), Supp. 6:280 (Wald)
RENDILLE: 9:35-65 (Oomen)
RESHE: 8:259 (Bennett and Sterk)
RIBE: Supp. 6:96 (Hinnebusch)
ROMANCE: 8:313 (Saib), Supp. 6:79, 83 (Givón), Supp. 7:102 (Greenberg)
RON: 8:276 (Newman), Supp. 7:39 (Ebert)
RON (BOKKOS): 7:204 (Frajzyngier), Supp. 6:170-172 (Newman), Supp. 6:221-222, 224 (Schuh), Supp. 7:80 (Frajzyngier)
RON (BUTURA): 7:204 (Frajzyngier)
RON (DAFFO): 7:204 (Frajzyngier)
RON (FYER): 7:204 (Frajzyngier), Supp. 6:171 (Newman), Supp. 7:80 (Frajzyngier)
RONGA: 8:153, 160, 165-66 (Herbert)
RUFILI: Supp. 6:95 (Hinnebusch)
RUMANIAN: Supp. 7:102 (Greenberg)
RUNDI: 8:251 (Bennett and Sterk)
RUNYANKORE: Supp. 7:107 (Herbert)
RUSSIAN: 9:83 (Little), Supp. 7:2 (Ali and Sylla)
RUUVU: Supp. 6:97-101, 103, 108 (Hinnebusch)
SABAKI: Supp. 6:97-106, 108 (Hinnebusch), Supp. 7:211-213, 216-
217, 219 (Sedlak)
SAFWA: 8:128 (Kalema)
SAGALA: Supp. 6:95-96, 99, 108 (Hinnebusch), Supp. 6:269, 273-
274, 280 (Wald)
SAGHALA: Supp. 6:97-98, 100-103, 108 (Hinnebusch), Supp. 7:212,
217 (Sedlak)
SAHARAN: Supp. 6:223 (Schuh)
SALISHAN: 7:13 (Denny and Creider)
SAM: 9:35, 52 (Oomen)
SANGO: Supp. 6:96 (Hinnebusch)
SEMITIC: Supp. 6:75-76, 86 (Givón)
SEMITO-HAMITIC: Supp. 6:170 (Newman)
SERBO-CROATIAN: Supp. 7:67 (Fodor)
SERER-NON: Supp. 7:100 (Greenberg)
SESOTHO: see SOTHO
SESTWANA: see TSWANA
(Sedlak)
SHA: 8:277 (Newman)
SHAMBALA: Supp. 6:95, 96, 103, 106, 108 (Hinnebusch)
SHEKO: Supp. 7:20 (Bender)
SHERBRO: 9:150 (Herbert)
SHIRAZI: Supp. 7:211 (Sedlak)
SHONA: 8:153-54, 158-60, 166-67 (Herbert) [Includes Zezuru, Karanga,
Ndu, Manyika, Korekore], 8:205 (Morolong and Hymán), 9:327
(Lombard), Supp. 7:106-107 (Herbert)
SIAMESE: 8:178 (Hombert), Supp. 6:53-55 (Fromkin)
SIDAMO: 7:212-13, 216 (Hudson)
SINHALESE: Supp. 7:2 (Ali and Sylla)
SINO-TIBETAN: 7:13 (Denny and Creider)
SISWATI: Supp. 6:211-220 (Schachter)
SLAVIC: 8:161 (Herbert)
SOMALI: 9:35, 43, 47, 50 (Oomen)
SONGhai: 9:1-34 (Nicolaï)

[see also Pedi, Tswana, S. Suto]

Northern Sotho: see Pedi

Southern Sotho: 8:149-56, 160, 162, 166 (Herbert), 9:213 (Angogo)

Spanish: 7:191 (Clifton), 7:216 (Hudson), 8:119 (Dalgish), 8:315 (Saib), 9:83 (Little), Supp. 7:143 (Leben)

Sudanic: 8:121 (Trifković)

Sukuma: 8:206, 210 (Morolong and Hyman)

Surj: Supp. 7:12-13 (Bender)

Surma: Supp. 7:11-21 (Bender)

Susu: 7:296, 297, 298, 303, 305 (Bimson), 9:188 (Dwyer), Supp. 6:31 (Dwyer)

Sutho: see Sotho


Swati: see Siswati

Swazi: 8:153, 160 (Herbert), 9:160 (Herbert), 9:212 (Angogo)

Swedish: 9:161 (Herbert)

Tagalog: 7:113 (Anderson), Supp. 7:2 (Ali and Sylla)

Tai (Lue): Supp. 6:57 (Fromkin)

Taita: Supp. 6:95-98, 101, 106 (Hinnebusch), Supp. 6:269, 272-74, 276 (Wald), Supp. 7:212 (Sedlak)

Tamart: Supp. 7:99 (Greenberg)

Tamil: 9:212 (Angogo)

Tarok: Supp. 6:201-209 (Robinson)

Taveta: Supp. 6:95 (Hinnebusch), Supp. 7:212 (Sedlak)

Temain: Supp. 7:17 (Bender)

Temne: 8:241-74 (Bennett and Sterk), Supp. 7:101 (Greenberg)
TERA:  8:277, 281 (Newman), 9:71 (Jaggar), Supp. 6:221-23, 229, 231 (Schuh), Supp. 7:38 (Ebert), Supp. 7:81-82 (Prajzyngier)

THAGICU:  Supp. 6:270-74, 276, 279-80 (Wald)

THAI:  9:168 (Dwyer)

TIV:  8:241-74 (Bennett and Sterk), Supp. 6:275 (Wald), Supp. 7:100 (Greenberg)

TO:  Supp. 7:185-97 (Noss)

TOBA:  7:13-15 (Denny and Creider)

TOBOTE-BASARI:  Supp. 7:98 (Greenberg)

TOJOLABAL:  Supp. 6:150 (Ladefoged et al.)

TONGA:  8:153, 160 (Herbert), 9:327 (Lombard), Supp. 7:108 (Herbert)

TOPOSA:  8:99 (Givón), Supp. 6:73-93 (Givón)


TSONGA:  8:154-56, 160, 166-67, 169 (Herbert)

[see also TONGA, TSWA, RONGAJ]

TSOTSI:  9:217 (Angogo)

TSWA:  8:153, 157, 160 (Herbert)

TWSANA:  7:46-52, 54, 55, 57-58, 60 (Stahlke), 8:145-49, 153-64, 166, 168-70 (Herbert), 9:160 (Herbert), 9:212 (Angogo), Supp. 7:106 (Herbert)

TUΣETA:  Supp. 6:96 (Hinnebusch)

TUBU:  Supp. 7:20 (Bender)

TULA:  8:241-74 (Bennett and Sterk)

TUMAK:  Supp. 7:39 (Ebert)

TUMBUKA:  Supp. 7:107 (Herbert)

TUNEN:  8:241-74 (Bennett and Sterk)

TUSCARURA:  Supp. 6:79 (Givón)

TWI:  7:175-94 (Clifton), Supp. 6:66 (George), Supp. 6:191-97 (Nyaggah), Supp. 7:58 (Elugbe)

UMBUNDU:  Supp. 7:63-71 (Fodor)

UNDU:  Supp. 7:19 (Bender)

URBIE:  Supp. 7:53 (Elugbe)

URDU:  9:212 (Angogo), 9:223 (Mazrui), Supp. 7:11 (Bender)

URHOOBO:  8:241-74 (Bennett and Sterk), Supp. 7:53-62 (Elugbe)

VAI:  7:296, 297, 305, 346 (Bimson)
VENDA: 8:153-56, 158-60, 165-67, 169 (Herbert), Supp. 7:106, 108 (Herbert)

VIDUNDA: Supp. 6:95 (Hinnebusch)

VOLTAIC: Supp. 7:97-99 (Greenberg)

WASSULUNKA: 7:297, 316-39 (Bimson)

WELSH: Supp. 7:2-3 (Ali and Sylla)


WEST ATLANTIC (COMMON): 7:96 (Anderson)

WOLOF: Supp. 7:99 (Greenberg)

WUKARI: 8:251 (Bennett and Sterk)

XASSONKE: 7:297, 298-316, 341, 343 (Bimson)

XHOSA: 8:152-56, 160, 166 (Herbert), 9:159, 161 (Herbert), 9:212 (Angogo)

YAKA: Supp. 7:106 (Herbert)

YALA (IKOM): 8:251, 256 (Bennett and Sterk), Supp. 6:1-12 (Bunkcwske), Supp. 7:58 (Elugbe)

YALUNKA: 7:296, 297, 298, 303, 305 (Bimson)

YAO: Supp. 7:216 (Sedlak)

YATYE: 7:52, 54-55, 57-58, 60 (Stahlke), 8:258 (Bennett)

YEEI: 7:11 (Denny and Creider)

YERGAM: see TAROK


YUKULTA: 8:27 (McConvell)

ZAAR: Supp. 6:171 (Newman)

ZALAMO: Supp. 6:95, 99, 108 (Hinnebusch)

ZARMA: 9:1, 12, 25-29 (NicolaF)

ZIGUA: Supp. 6:95, 103, 106, 108 (Hinnebusch), Supp. 7:216 (Sedlak)

ZILMAMU: Supp. 7:12-13, 17, 19 (Bender)

ZIME: Supp. 7:38-39 (Ebert)

A survey of the linguistic setting of South Africa, including both native African languages and languages of European origin. The twelve chapters are arranged under the headings "The setting", "The main languages of South Africa", and "Language in education".


A collection of five papers presented at the 1977 Georgetown University Round Table on Languages and Linguistics. The papers are Larry M. Hyman "Tone and/or accent", George N. Clements "Tone and syntax in Ewe", Ilse Lehiste and Pavle Ivč "Interrelationships between word tone and sentence intonation in Serbo-Croatian", Jean-Marie Hombert "A model of tone systems", and Ellen Schaub "Focus and presupposition: A comparison of English intonation and Navajo particle placement."

The following publications are all published by the Société d'Études Linguistiques et Anthropologiques de France (SELAF):


A collection of nine papers on a variety of topics presented at the 1974 Congress of the West African Linguistic Society. Included with the book is a tape cassette illustrating drum language and tonal patterns discussed in two of the papers.


A description of riddles in Tusumwinu, a language of Zaire, which rely on tonal clues. Included is a corpus of 200 riddles.

Documents biological terminology which is similar from one Pygmy group to another, even though the various groups now speak language very similar to or identical to non-Pygmy neighbors.