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REANALYZING PRENASALIZED CONSONANTS

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1. Introduction

The exact status and treatment to be accorded so-called "pre­nasalized consonants" which contrast in many languages with simple nasal consonants and simple oral consonants have puzzled linguists for decades. It has traditionally been assumed that those prenasalized consonants which are not morphologically complex are unitary segments because 1) the two components are homorganic, 2) they evidence surface length of "simple" consonants, and 3) they function within a single syllable. Detailed arguments for this latter claim are difficult to come by and are often based solely on the fact that native informants when asked to artificially break up words containing prenasalized con­sonants into smaller pieces (supposedly equivalent to syllables) will place the prenasalized consonant in a single unit. Thus, in Luganda:

(1) lu-ga-nda
    mu-ntu
    lye-mvu

'Luganda'
'(the) man'
'ripe banana'

which syllabification corresponds nicely to the canonical Bantu syllable structure. However, such artificial syllabification is often learned and therefore of questionable linguistic value. Also, as I will define the term syllable, it refers to a type of organization severely differ­ent from that presented by such arguments. This will be expanded shortly.

---

This paper is a revised and expanded version of my paper presented at the 1974 Winter LSA meeting entitled "Prenasalized Consonants as Consonant Clusters." I am grateful to Amy Myers and Arnold Zwicky for their helpful comments on an earlier version of the paper and especially to Ilse Lehiste under whose guidance the research was carried out.
Various attempts have been made to classify "natural" segment sequences with reference to markedness theory (e.g., Chomsky and Halle [1968, Chapter 9]). This same goal is attempted by the various "sonority hierarchies" which have been proposed which purport that the internalness of a segment is a direct function of its sonorance, i.e., maximally sonorant segments are to be found in the center of the syllable with the sonorance of segments decreasing as the syllable margins are approached. Thus, Semiloff-Zelasko [1973:604] gives the following "typical" order from syllable margin to syllable margin:

(2) Obst-Nas-Liq-Glide-Syllabic-Glide-Liq-Nas-Obst

However, neither of these treatments attempts to specify which sequences may combine to form segments or at least to function as unit segments. In the latter case, it seems as if complex unitary segments are defined only when a violation of the sonority hierarchy would otherwise obtain, e.g., a nasal is more sonorant than an oral stop and should therefore be more internal. In the case of prenasalized consonants, this universal condition is not met, so a complex unit segment is defined.

(3) * [n d a] but [nd a]
   1 2 3   1 2

This same type of reasoning is used by linguists who state that the canonical Bantu syllable is of a CV form and claim therefore that prenasalized consonants are to be analyzed as simple unit consonants.

2. Traditional Analyses

Chomsky and Halle [1968:316-7] suggest three possible alternatives for the treatment of prenasalized consonants within modern phonological theory. First, they suggest that it may be necessary to posit some feature which will govern the timing of different movements within a simple segment. For example, in the case of prenasalized consonants, we would need a feature to account for the raising of the velum prior to the release of oral occlusion. One advantage of this proposal is that it would allow us to extend the treatment of prenasalized consonants to postnasalized consonants (i.e., stops with nasal plosion) by means of
a simple reversal of the feature specification. Thus, whatever the
exact feature chosen, [ndo] and [dno] would have mirror-image
specifications. This analysis parallels the distinction between
various other types of mirror-image distinctions, e.g., pre-aspira-
tion vs. post-aspiration in Modern Icelandic, pre- vs. post- vs.
simultaneous glottalization, release of doubly articulated consonants,
and possibly voice-onset time.

Chomsky and Halle's second alternative makes reference to their'
already motivated feature [delayed release]; the difference between
ordinary nasal and prenasalized consonants would be an instance of
instantaneous vs. delayed release. Thus, the treatment accorded pre-
nasalized consonants would be similar to that accorded affricates.
Chomsky and Halle see no way to argue the phonetic validity of this pro-
posal. Upon close examination, however, it seems clear that some pro-
cess very different from a simple delayed release of stricture is at
work. Timing of release of stricture has no relevance for velic closure.
Even if we interpret this proposal to mean only that timing considerations
are involved, I will demonstrate that this weaker proposal is itself in-
sufficient. The last of Chomsky and Halle's alternatives, which they
attribute to J. McCawley (p. 317 fn.), is that prenasalized consonants
be regarded as obstruent nasals (and hence [-sonorant]) as opposed to
the more familiar type of nasals which are [+sonorant]. This proposal
must be rejected since the nasal component of prenasalized consonants
is indeed sonorant as is evidenced by the fact that in many languages

\[\begin{array}{c}
n / \bar{V} \bar{V} \\
nd / \bar{V} V \\
dn / V \bar{V} \\
dnd / V V
\end{array}\]
in initial position it forms a separate syllable, is tone-bearing, and hence [+sonorant]:

\[
\begin{array}{l}
\text{n-jukí} & \text{p-ju-ki} & \text{'(the) bee'} \\
\text{mpá} & \text{m-pa} & \text{'give me'} \\
\text{hkúbà} & \text{q-ku-ba} & \text{'rain'} \\
\end{array}
\]

This same piece of evidence argues against the validity of the artificial syllabification analysis presented earlier.

A more recent proposal is that of Campell [1974] wherein he argues that complex units, e.g., affricates, labialized and palatalized consonants, and, I assume, prenasalized consonants as well, be described by means of multi-columned matrices, e.g.,

\[
\begin{array}{c}
\text{[ns]} \\
\text{[+nas -nas]} \\
\text{[+voi -voi]} \\
\text{[-cont +cont]} \\
\text{[+tone -tone]} \\
\text{[+cor]} \\
\end{array}
\]

Constraints on what features can co-occur will be stated as universal redundancy or marking constraints although exactly how this is to be accomplished is still unclear. Campbell notes that complex symbols do not necessarily refer to non-unit segments since they are treated as unit segments in many languages. Rules may refer to either or both columns of matrices with no restrictions.

Amy Myers [1974] opts for a "vector feature", representing a changing, vectoring value over the duration of the segment, to account for the prenasalized consonants of Kikuyu. This feature, termed [early velar closure], is in spirit identical to Chomsky and Halle's first proposal for a movement feature. It refers to complex derived prenasalized consonants as units partaking of qualities of both components. Myers notes that other vector features are already motivated and are by no means characteristic of segments only. For example, Leben [1971] has demonstrated that two tones can be compressed onto a single segment and behave as a single unit. The problem with such an analysis is that it can account only for the most common sort of prenasalized
consonants, i.e., prenasalized voiced plosives:

(6) mb nd nj ng

which are, in fact, the only prenasalized consonants in Kikuyu since nasals are obligatorily deleted before continuants and a voiceless plosive after a nasal assumes the voicing specification of the nasal. Myers' rule for deriving prenasalized consonants from morphologically complex sequences of nasal + consonant is:

(7) \[
\begin{bmatrix}
+\text{nas} \\
+\text{cons}
\end{bmatrix}
\begin{bmatrix}
-\text{nas} \\
-\text{cont}
\end{bmatrix}
\xrightarrow{1}
\begin{bmatrix}
1 \\
2
\end{bmatrix}
\rightarrow [+\text{e.v.c.}] \emptyset
\]

which now treats prenasalized consonants as a special subclass of nasal consonants with which they pattern in certain phonological rules.

However, although other types of prenasalized consonants are less common, they do indeed occur in the languages of the world. Luganda, a Bantu language of East Africa, for example, evidences not only the more common prenasalized voiced plosives but prenasalized voiceless plosives and prenasalized voiced and voiceless continuants:

(8) Luganda: mb nd nj ng
mp nt nc nk
mv nz
mf ns

Obviously, a simple movement feature such as that proposed by Chomsky and Halle and utilized by Myers will not be able to account for these segments. Campbell's complex symbol proposal would give us feature specifications like that in (5) which seem intuitively ad hoc, unnatural, and, it will be argued, largely useless for phonological analysis.

3. Phonetic Evidence for a Cluster Analysis

For unit segment analyses in general, there is the problem posed by the fact that the nasal component of prenasalized consonants, in Luganda and many other languages, is syllabic in initial position in that it comprises a separate syllable. I will demonstrate that for pur-
poses of syllabification and timing, the two components are indeed always members of separate syllables and are, therefore, not to be treated as comprising unitary (complex or not) segments.

3.1 Syllables and Timing. It is important to state how the term syllable will be utilized in this paper. Syllable refers to an abstract unit of organization which underlies the timing system of the language. It has been demonstrated by Slis [1968], Kozhevnikov and Chistovich [1965], Lehiste [1970], and Shockey, Gregorski, and Lehiste [1971] for diverse languages that the duration of a multisegmental string of speech is fairly rigidly determined, i.e., that speech is programmed at some unit higher than individual segments. Whether this unit be the syllable, word, phonological phrase, or sentence is not at issue here. The duration of the higher unit is predetermined; the durations of individual segments may vary only as long as their sum equals approximately the duration of the higher unit. If speech is programmed at a level higher than single segments, we expect negative correlations (temporal compensations) between the subparts: if one part is longer than average, another will be shorter than average. Temporal compensation at the level of the syllable in Luganda forces us to regard prenasalized consonants as consonant clusters which superficially present the combined length only slightly greater than units, but, at all times, the nasal and non-nasal components maintain their individual integrities.

3.2 Method. For purposes of this investigation, recordings of the speech of Mr. Henry Ssali, a native of Kampala, were made in an I. A. C. sound-treated chamber. The recordings were a series of about 150 polysyllabic words uttered in a single sentence frame:

(9) Ñjogera ___ omulundi gumu. 'I am saying ___ once.'

with the informant asked to read at "a normal rhythm." The first and last tokens produced were discarded since these would be expected to evidence the most deviation rhythmically. The recordings were
analyzed by means of broad-band spectrograms produced on a Voiceprint 700 Spectrograph and were also processed through a Frøkjær-Jensen Transpitch meter and recorded in the form of duplex oscillograms by an Elema-Schönander mingograph at a speed of 100 mm/sec. Segmentation of the oscillograms was performed according to the standards set forth in Naeser [1969].

3.3 Results and Discussion. It was early established that there is a constant durational ratio, approximately 1:2, between short and long (not lengthened) vowels in Luganda. This ratio is based on an analysis of some 275 tokens and holds true for syllables such as:

(10) /a/ vs. /aa/; /ka/ vs. /kaa/

In fact, syllables such as:

(11) /aa/ and /ka/

will evidence the same surface length, which is one-half the surface length of:

(12) /aa/ and /kaa/

This suggests that temporal compensation for the absence of a consonant onset occurs at the level of the syllable in Luganda.

There is a rule in Luganda:

(13) V $+ [\text{+long}] / \text{NC}$

The problem presented by this rule is that vowels lengthened by it are longer than underlying short vowels and not as long as underlying long vowels. How then do these phonologically lengthened vowels fit into the timing system of Luganda and what specifically is the motivation for vowels lengthened before prenasalized consonants?

---

3 The surface vowel system includes five qualities and two quantities. The actual mean ratio for length differentiation is 1:1.925. Measurements of vowels were taken only in medial position. Tone was shown to have no effect on vowel quantity (cf. Lehiste [1970]).
It is clear that V:NC sequences (where V: represents a phonologically lengthened vowel) are realized as V:N$_C$ (where $ represents the syllable boundary). The strongest evidence in support of this analysis is that syllables of the shape CVV (where VV represents an underlying long vowel) are durationally equivalent to sequences CV:N$_C$. This pattern is schematized below: 

\(\text{(14) CVV} = \text{CV:N}_C\)

<table>
<thead>
<tr>
<th></th>
<th>ku</th>
<th>ti</th>
<th>g</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td>ku</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ku</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ku</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

where two examples of negative correlations are to be observed: the vowel /u/ in kutunda lengthens before the prenasalized consonant and in the same form /a/ lengthens to account for the shortness of its syllable onset. Both lengthenings have as their goal the maintenance of a certain syllable weight. Since the combined durations of the two components of prenasalized consonants are only slightly longer than unitary consonants, we have a natural explanation why lengthened vowels (V:) are not as long as underlying long vowels (VV). We want to consider the nasal component of prenasalized consonants as a member of the syllable to its left and the non-nasal component a member of the syllable to its right.

I propose that there exists a distinction between two basic syllable weights in Luganda: light and heavy. A light syllable is one which is composed of a single mora:

\(\text{(15) CV, V, C}\)

Heavy syllables are composed of two or more morae and therefore show a good deal more typological variation:

\[\text{The duration of each segment was measured from the oscillogram with an accuracy estimated to be to the nearest 1/2 mm. or 5 msec. This schema is based on an analysis of some 25 such pairs.}\]
(16) a) compound (i.e., long) vowel nucleus  
b) a CG onset  
c) a C offset  
d) both b and c  

Further evidence for this basic two-fold distinction in syllable length comes from the fact that heavy syllables other than CVV and CV:N evidence the same surface length. Thus, we might extend the schema above to include CGV: sequences since there is another compensatory rule in Luganda:

(17) V + [+long] / CG ___  
so that:

(18) CVV = CV:N = CGV:  

<table>
<thead>
<tr>
<th>Syllable</th>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>kūtá:ndá</td>
<td>ku taa m a</td>
</tr>
<tr>
<td>'to betray'</td>
<td></td>
</tr>
<tr>
<td>kūtyā: bá</td>
<td>ku tya: b a</td>
</tr>
<tr>
<td>'to go collect'</td>
<td></td>
</tr>
</tbody>
</table>

It is possible to have syllables of the shape CGV:N in Luganda which, according to traditional mora-counts, would be said to be composed of three morae: a complex onset, short vowel nucleus, and consonant offset. This might be termed an "extra-heavy syllable." However, syllables in Luganda are only either light or heavy, and reference to morae is really superfluous. Thus, the root vowel in kútýanka theoretically has two reasons to lengthen: once by the CG onset and once by the following prenasalized consonant. In fact, both lengthenings do not occur or, if they do, one applies vacuously since a 3-morae syllable has the same length as a 2-morae syllable:
Additional evidence for this analysis is presented by a casual speech process whereby prenasalized consonants are replaced by simple nasal consonants. Thus, kutwanga may be either [kutwəŋa] or simply [kutwəŋa]. Of course, the CG onset still works for vowel lengthening, but it is clear that the nasal originates in the leftmost syllable since that vowel may be heavily nasalized and nasalized vowels are not to be found before simple nasal stops. This will be expanded shortly. It is clear that the non-nasal component is deleted and not nasalized since we would in that case expect a geminate nasal. Thus, even as late as casual speech rules, the two components do not function as a unit segment.

It is interesting to note that before geminate consonants, vowels obligatorily shorten in Luganda. I claim that both prenasalized and geminate consonants are clusters derived synchronically by a single phonological rule. Thus, the distinction:

\[(20) \ V \ + \ [+\text{long}] \ / \ ___\text{NC} \]
\[(21) \ V \ + \ [-\text{long}] \ / \ ___\text{CC} \]

is a perplexing one, but I believe there is a phonetic motivation for it. In the case of geminate clusters, the only distinction between single and geminate consonants is the duration of stricture. This is again a simple durational contrast on the order of 1:2. The perception of geminates is reinforced in certain cases by vowel shortening:

\[(22) \ /\text{ba-naa-ta}/ \quad \text{banaa-ta omulenzi} \quad \text{'they will set the boy free.'} \]
\[ /\text{ba-naa-tta}/ \quad \text{banaa-tta omolenzi} \quad \text{'they will kill the boy.'} \]
where consonant and vowel length work together for perception. In the case of prenasalized consonants, the opposition between simple and prenasalized consonants is not remotely related to duration. It is a distinction based exclusively on velar closure during production.\(^5\)

Further evidence for this analysis is presented by the schema:

\[(23) \text{CVV} = \text{CV:N} = \text{CVC}\]

\[
\begin{array}{c|c|c|c|}
\text{kut\textsuperscript{*}ikk\textsuperscript{k}a} & \text{ku} & \text{tti} & \text{k} & \text{a} \\
\text{'to fancy'} & & & & \\
\text{kut\textsuperscript{*}imb\textsuperscript{a}} & \text{ku} & \text{ti:} & \text{mb} & \text{a} \\
\text{'to bind'} & & & & \\
\text{kut\textsuperscript{*}ikk\textsuperscript{k}a} & \text{ku} & \text{ti} & \text{k} & \text{k} & \text{a} \\
\text{'to lift'} & & & & \\
\end{array}
\]

where, although no clear acoustic cues for segmentation of the geminate cluster are present, it appears appropriate to segment on the basis of an already established syllable weight. The vowel before the geminate shortens since each component of the geminate has normal consonant length; it lengthens before prenasalized clusters since the cluster as a whole presents normal consonant length.

3.4 Implications. Analyses claiming that the mora, strictly defined, is the unit of timing in Modern Luganda (cf. Stevick [1969]) clearly miss an important generalization when they report that sequences such as:

\[(24) \text{CGV:CGV:NCV}\]

\[
\text{CVCVCCVCVCCV}
\]

would both be composed of six morae; they do not evidence the same surface length. It seems more accurate to refer to the first as

\[\text{CGV:N:CGV}\]

...
a sequence of two heavy and one light syllables and the second as a sequence of six light syllables. It is clear that linguists who speak in terms of moric organization are not referring to the same level of organization that I am here.

It is, of course, also necessary to speak in terms of timing at a level higher than the syllable since contiguous syllables evidence influence one upon the other. For example, Luganda retroflex flap or continuant /l/ has an average phonetic duration of about 20 msec. for the flap and 40 msec. for the continuant, both substantially shorter than other surface consonants. In words containing this /l/, not only the vowel of the syllable in which it functions lengthens, but compensation is evident in the words as a unit:

(25) kúlágá
' to be embarrassed'

kúlálá
' to line up'

This is in keeping with Lehiste [1972] where it is claimed that words are programmed as whole units.

4. Phonological Evidence

4.1 Prenasalized [f] and [v]. I have claimed elsewhere [Herbert 1974b] that [f] and [v] do not occur as underlying segments in Luganda, but rather they are derived from sequences of /ku/ and /gu/. This change from velar to surface labial might seem like an extreme one on a synchronic level where several intermediate stages cannot be postulated, but in terms of an acoustic theory of sound change, it is exactly what one might expect. Simply, contiguous round vowels have been demonstrated to cause $F_2$ transitions of velar consonants to fall in a way that is characteristic of labials. 6

6 The change from velar to labial is not uncommon and is found in a wide variety of languages (see Campbell 1974:53-4). For example, in Rumanian, Latin [k] > [p], in Finnish [k] > [v], and in Luganda [k] > [f]. Some linguists have seriously tried to posit intermediate stages for these changes in order to maintain the principle of gradualness of sound change. Thus, for example, Hyman [1974] in his discussion of the
This explanation explains why these segments are normally followed by [w]-glide usually described as inherent rounding of the segments.

That [f] and [v] need to be accorded special status is further indicated by their behavior in NC clusters. Although NC clusters exhibit only slightly more surface length than is characteristic of underlying single consonants, the ratio between the relative duration of the nasal component and the following oral consonant varies systematically depending on the voicing specification of the oral consonant. That is, in a sequence of nasal + voiced consonant, it is the nasal which undergoes the lesser reduction. Likewise, in an analysis of a great number of English pairs such as bend–bent, build–built, Lehiste found that the resonant is systematically shorter before the voiceless plosive. For the voiced series, the only change involved in going from nasal to oral consonant is raising of the velum whereas for the voiceless series raising of the velum must be coordinated with cessation of vocal fold vibration. This must be clearly perceivable since it is the state of non-vibration which distinguishes the two series. This explanation claims that lengthened vowels before prenasalized voiced consonants should be slightly shorter than lengthened vowels before prenasalized voiceless consonants. This corresponds to the phonetic data available.7

However, in the case of prenasalized [f] and [v], the nasal greatly reduces (occasionally disappearing entirely) before both consonants. Since prenasalized [s] and [z] follow the pattern set by the plosives, it is not possible to explain away the extraordinary behavior of [f]

---

Luganda change posits:

*_{k} > k^h > k^{	ext{f}} > p^{	ext{f}} > f / ___ *_{y}

The intermediate stages here are unattested. This represents a misapplication of the general principle of gradualness of sound change. It is much more "natural" and correct to make reference to an empirically tested acoustic explanation for this interchange of labialized velars and labials (operating in both directions).

7 For example, in one token of kutanda, the nasal had a duration of 90 msec. and the plosive following 30 msec. In kutanta, the nasal was 60 msec. long and the following voiceless plosive 70 msec.
and [v] by reference to their continuance. I believe it is necessary here to refer to their status as derived segments. The reason the nasal severely reduces in both cases is that [f] and [v] are themselves complex segments: consonant and non-syllabic [ɣ]. This same analysis explains the systematic absence of [fy] and [vy] sequences in the lexicon; the gap follows from the fact that sequences of two glides are impermissible.

4.2 Nasalized Vowels. As I have already mentioned, additional evidence in support of the analysis that nasal components of prenasalized consonants function in the syllable to their left comes from the distribution of nasalized vowels. Nasalized vowels occur only—though not always—before prenasalized and geminate nasal consonants, never before simple nasal consonants. This implies that vowel nasalization does not occur across syllable boundaries. Nasalized vowels are therefore to be explained as an optional anticipatory lowering of the velum within a single syllable as would be expected on universal grounds.

4.3 Meinhof's Law. The final evidence in support of the cluster analysis comes from a late phonological rule in Luganda known as Meinhof's Law:

---

8 Patrick Bennett (personal communication) while accepting my analysis of [f] and [v] claims that there should be similar reduction of the nasal in [mbw] and other such sequences. Of course, the basic claim of my argument is that the relationship between [ɣ] and the consonant in such sequences is not the same as one finds in [f] and [v].

9 The term nasalized vowel is used here to refer only to those vowels evidencing nasalization greater than 20 msec. This is to exclude cases which might result from a slight non-coordination of the velum with the other articulators. This latter type is sometimes referred to by the misnomer inherent nasalization.

10 The facts of nasalization are not quite so simple. For example, vowels may nasalize between two simple nasal consonants as in kutānnāma. Again, this is what one might expect on universal grounds.
Some examples are:

(27) a. /n-bumba/ = bumbá 'I mould clay' (cf. ðbumbá 'you mould clay')
    /n-linda/ = ðnda 'I wait' (cf. ðnda 'you wait')
    (n₁ > nd > nn)
    /n-gendo/ = ndó 'journeys' (cf. ðndó 'journey')
b. /n-bala/ = mbá 'I count'
    /n-leeta/ = mbétá 'I bring'
    /n-gula/ = mbú 'I buy'

Although the segment affected might be termed a prenasalized consonant, the output of the rule is clearly a long, i.e., geminate, nasal consonant. Thus, even at the level at which this rule applies, we are dealing with two distinct segments. If we assume the rule affects unitary segments of any sort, it becomes much more complex:

(28) NC \rightarrow NN / \_\_\_ V(V)N

It is interesting to note that in Kikuyu Meinhof’s Law is more restricted, but that when it does apply the non-nasal components of the cluster is deleted so that the output is a simple nasal as the following examples from Myers [1974] demonstrate:

(29) /n-rem-eeet-ε/ = nemeetε 'I had cultivated'
    /n-gan-eeet-ε/ = ñaneetε 'I had recounted'
    /n-dug-eeet-ε/ = ndugeetε 'I had cooked'
    /n-gor-eeet-ε/ = ngoreetε 'I had bought'

Here too, it is not clear if a rule could delete half of a complex segment, but the loss of a movement feature is a tenable analysis for Kikuyu.

However, the operation of Meinhof’s Law in Holoholo [Coupez 1955: 14] makes the complex segment analysis even less tenable. Here the output of the rule is a simple nasal as in Kikuyu, but the deletion of the non-nasal consonant is accompanied by a lengthening of the preceding
vowel.

(30) /ku-n-lond-a/ kuunonda 'to follow me'

There is no way to explain this vowel lengthening under the complex segment analysis or by the loss of a movement feature since there is no change in the number of segments involved under these analyses. However, under the cluster analysis, simplification of the nasal + nasal cluster results in a lightening of the initial syllable, i.e., CVN becomes CV; to maintain its status as a heavy syllable, compensatory vowel lengthening occurs. The correctness of this analysis is demonstrated by the fact that nasal + nasal clusters which are not derived by Meinhof's Law evidence the same behavior:

(31) /ku-mon-a/ kumona 'to see'
    /ku-n-mon-a/ kuumona 'to see me'

This clearly demonstrates the incorrectness of the loss of a movement feature analysis for the Meinhof's Law cases, i.e., in kuunonda above, there is a second intermediate form *kunnonda which provides the input to nasal cluster simplification.

5. Conclusion

The evidence I have presented clearly supports the hypothesis that the nasal component and the non-nasal component of the so-called prenasalized consonants of Luganda function in separate syllables until very late in the application of phonological rules. This is true not only of the prenasalized consonants transparently analyzeable as morphologically complex but also for morpheme-internal prenasalized consonants. There is no distinction made in the treatment of the two. This supports an abstract phonological analysis in which all prenasalized consonants in Luganda are synchronically derived from a sequence of nasal + consonant.\[11\]

---

I have elsewhere argued for the analysis of prenasalized consonants in a sequence of NVC. This is not crucial to the issue at hand, and it is therefore not discussed here.
In fact, it is only under such an analysis that we can explain their identical behavior in syllabification and timing. Underlying unitary segments do not function in two syllables. Although more "natural" phonological treatments would have us enter the non-alternating prenasalized consonants as such in the lexicon, the acoustic evidence strongly suggests that it may be incorrect to do so.

It is not claimed that prenasalized consonants are barred from appearing at a deep level of phonological organization especially in languages where there exists a purported contrast between medial VN.CV and V.NCV syllabification, e.g., Fulani [Bell 1970:45] and Sinhalese (Amy Myers, personal communication). However, it has been shown that they do not occur as such in at least one language where they have been traditionally so analyzed, Luganda. An accurate theory of linguistic description will have to account for both types of NC sequences if they do indeed exist. It appears that even in languages very closely related to Luganda such as Bravanese Swahili and Kikuyu (M. Goodman and A. Myers respectively, personal communications) the prenasalized consonants function very differently than those in Luganda. However, the instrumental verification of these claims remains to be done. The evidence from Luganda is at least suggestive that more traditional analyses of these consonants, even in languages which do not evidence the complete series, and perhaps of all the so-called "apparent violations of the sonority hierarchy," may be missing what is really a significant generalization and that the decisive evidence in such cases will be provided by analyses of the timing systems of the languages involved.
REFERENCES


VOWEL CONTRACTION AND VOWEL REDUCTION IN MANKON

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1. Introduction

The Mbam-Nkam languages of the Eastern part of the area (in Cameroon) show nouns with the structure CV(C) or NCV(C), where the homorganic nasal (N) is not syllabic. However, in Bangangté, the most South-Eastern variety of Mbam-Nkam, high nouns may be disyllabic before a pause and end on a H or, in some exceptions cases, on a downstepped H vowel of predictable quality:

(1) ntənə 'market'
    kůʔú 'a certain tuber'

Nouns in this language have no prefixes except occasionally a non-syllabic homorganic nasal in the singular, the plural or both:

(2) ndú 'husband' pl. dú
    bí 'knife' pl. mbí
    ndʒ 'horn' pl. ndʒ

---

1 The Federal University of Yaoundé invited the second author to supervise the first author in writing a paper on the phonology of Mankon. The Netherlands Foundation for the Advancement of Tropical Research (WOTRO) provided a travel grant (WR 39-29) which made it possible for them to work together for some weeks in April 1974. During that period we spotted the theoretical importance of certain phenomena. It was decided that the problem would be jointly studied as part of a research project in the Cameroon Highlands during the summer of 1974, directed by Dr. Larry Hyman. The University of Leiden granted the second author another month in the area. The authors profited greatly from discussions with other linguists working in the project, especially with Dr. Larry Hyman. A preliminary version of this paper was presented at the 6th Annual Conference on African Linguistics, University of Ohio, April 11-13, 1975.

2 The vertical accent indicates a downstepped or lowered H tone, after which no higher level is possible.
A two-way tonal distinction in verb stems suggests a simple tonal distinction between H and L tone. This analysis, however, complicates enormously the underlying representation of monosyllabic nouns. These already show in isolation a three-way tonal distinction between L, Mid and H:

(3) mvแน 'chief'
    k∯ 'spear'
    m∯n 'child'

In most other environments they show a two-way distinction. The Mid tone nouns are in some environments grouped with the H tone ones, in other environments with the L tone ones. In the associative construction a seven-way tonal distinction between monosyllabic nouns is found. These facts are explained in Voorhoeve [1971] by positing an associative marker consisting of a floating L or H tone (concurring with the nominal class of the first noun), and by accepting three tones for every monosyllabic noun:

i. a preceding L tone representing a nominal prefix,
ii. a L or H tone on the nominal syllable,
iii. a following L or H tone which is part of the lexical morpheme.

Monosyllabic nominal stems in a Bangangté lexicon should therefore be grouped in four tone classes (the tone between brackets represents the "floating" tone mentioned under iii. above):

(4) a. L(L) -f∯n 'chief'
    b. L(H) -k∯ 'spear'
    c. H(L) -m∯n 'child'
    d. H(H) -zw∯ 'wife'

Three of them are tonally different in isolation: a. is realized as L, b. as Mid, but c. and d. are both realized as H. The last two tone classes can be differentiated in some environments, e.g., before a particle ลำ at the end of a relative clause, where m∯n ลำ is distinct from zw∯ ลำ. A H(H) morpheme ending on a consonant has a vocalic release before pause, as demonstrated in (1), while a H(L) morpheme does not have this. Thus, in isolation, one will find นท∯น 'market', but m∯n 'child'.
The associative construction has to admit, if this analysis is accepted, not less than three floating tones between the two syllables of the monosyllabic nouns, like in:

(5) $\text{bon mən}$  
1-3 3

\[ '\text{the children of the child}'^3 \]

which has the underlying structure:

(6) \[ /'bən' + ' + 'mən'/ \]

Voorhoeve [1971] claims that all these "floating" tones are based on internal reconstruction only, although the relation with the tones of Proto-Bantu is obvious.

The most Western member of the Mbam-Nkam group, the Mankon language which forms part of the Ngemba cluster and is spoken around Bamenda, offers good comparative evidence for the reality of these floating tones in Bangangté, and at the same time for the way in which these vowels gradually disappeared, until only a floating tone remained. It had already become evident that the nominal prefixes were segmentally expressed in the more Western part of Mbam-Nkam [Dunstan, 1966]. Mankon offers clear evidence for the reality of the other floating tones too. The associative marker is often segmentally expressed, as in:

(7) $\text{ml-sən mf bʃ-ləmə}$  

\[ '\text{the teeth of the witches}' \]

In isolation the final tone is also expressed on a vowel of predictable quality:

(8) $\text{ml-səŋə}$  

\[ '\text{teeth}' \]

$\text{bʃ-ləmə}$  

\[ '\text{witches}' \]

$\text{i-kəŋə}$  

\[ '\text{cornbeer}' \]

$\text{ŋ-səŋə}$  

\[ '\text{bird}' \]

All the floating tones set up for Bangangté are expressed in some way

---

$^3$ In complicated tonal phrases in Bangangté, we cannot rely on normal tone marks. The number system uses 1 as the highest tone.
or other in Mankon, if conditions are favorable. Conditions are not always, as in those cases where the associative marker and the nominal prefix are vocalic. An underlying form like

\[(9) \ /l\text{-fênd} + f + l\text{-bêr}a/ \ 'the locks of the fools'\]

will result in

\[(10) [l\text{f}l\eta \ bêr\]a],

in which the three intermediate vowels have only preserved the \(H\) tone, manifested in the rising tone on the preceding vowel. The internal evidence, however, is much clearer in Mankon and confirms the Bangangté analysis.

To appreciate the evidence, it is necessary to present the essentials of the Mankon phonology (in section 2), and of the Mankon noun class system (in section 3). A description and interpretation of the vowel contraction in Mankon will be presented in section 4. A final section 5 will contain a discussion of the gradual loss of vocalic features in a historical perspective.

2. An Outline of Mankon Phonology

Only those facts are presented which are absolutely necessary to understand the vowel contraction rules. The underlying form of all Mankon morphemes (except some grammatical morphemes like some pronouns, nominal prefixes and concords) is \(C_1V_1(C_2)e\). Both vowels \(V_1\) and \(e\) can show a tonal distinction between \(L\) and \(H\). One has therefore four tone classes of nouns:

\[(11) \ a. \ L\ L \ /-kâŋe/ \ [kâŋe] \ 'squirrel'\]
\[/bâŋe/ \ [bê] \ 'bag'\]
\[b. \ L\ H \ /-bl\?e/ \ [bl\?e] \ 'termite'\]
\[/dzâe/ \ [dzã] \ 'soup'\]
(11) c. H L /-dzownership/ [dzownership] 'thorn'

/-dhouse/ [dhouse] 'house'

d. H H /-kcrab/ [kcrab] 'crab'

/-kwpaste of yams'/

The possibilities of C_1 are not enumerated, because they do not influence the contraction rules. The position of V_1 can be occupied by nine vowels:

(12) front central back
   i   i   u close
   e   e   o mid non-close
   0   a   0 open

Examples are:

/-dplace/ [dplace] 'place'
/-btermite/ [btermite] 'termite'
/-ftmouse/ [ftmouse] 'mouse'
/-kkybasket/ [kkybasket] 'basket'
/-theart/ [theart] 'heart'
/-kobean/ [kobean] 'bean'
/-bbehe-goat/ [bbehe-goat] 'he-goat'
/-bbag/ [bbag] 'bag'
/-konbelt/ [konbelt] 'belt'

In the surface representation, one may find three nasal mid vowels [₀], [₀] and [₀], which are analyzed as their open counterparts, followed by /na/. This analysis is supported by the comparison of identical morphemes before consonant and before vowel or pause:

(13) /ₐ-kbone· zá-åe/ [ₐkbone dzå] 'the bone'

/ₐ-kbone/ [ₐkbone] 'bone'

/ₐ-bag· zá-åe/ [ₐbag dzå] 'the bag'

See the remarks on -ye on the bottom of p. 133.
(13) /ä-bänë za-ää/ [äbän dzät] 'the bag'
/ä-bänë/ [äbän] 'bag'
/ä-fänë za-ää/ [äfän dzät] 'the field'
/ä-fänë/ [äfän] 'field'

It can be shown in the same way that [könë] is the surface representa-
tion of underlying /-könë/ and [fö] of /-fë/ 'lock'. Here, however, there is no one to one relation, as will become clear from the following correspondences:

(14) /ä-fänë za-ää/ [äfän dzät] 'the lock'
/ä-fänë/ [äfänë] 'lock'
/ä-bfö za-ää/ [äbfö za] 'the dance'
/ä-bfö/ [äbfö] 'dance'

Informants sometimes hesitate as to what would be the phonetic repre-
sentation before a consonant in these cases, especially in the associ-
itive construction: /m1-dzenë mf  ámbärë/ 'the urine of the fool' could be realized as [mdzëm ma bäërë] or as [mdziñ ma bäërë], which indicates that informants hesitate between two underlying structures /m1-dzenë/ or /m1-dziñë/, which would have the same realization in isolation.

The position of \( C_2 \) can be occupied by seven consonants:

(15) labial alveolar velar glottal

voiceless ?

voiced b r g

nasal m n ñ

---

5 In Mankon one finds upstep and downstep. In general one could state that the first downstep in a tone phrase is executed by raising the preceding H. Upstep is indicated by + (a vertical upwards point-
ing arrow). The rules are actually more complicated and involve H tone copying on a L between H tones after downdrift. So here /ä-bfö za-ää/ is converted via the following intermediate steps /ä-bfö za-ää/ + /ä-bfö za-ää/ + /ä-bfö f za-ää/ + /ä-bfö f za-ää/ into [äbfö za].
Examples are:

/à-íða/ [àíà] 'country', 'village'
/à-bëë/ [àbëë] 'he-goat'
/à-bërë/ [àbërë] 'fool'
/à-dzëë/ [àdzëë] 'bowl(s)'
/à-îëmë/ [àîëmë] 'blood'
/à-bëënë/ [àbëë] 'bag'
/à-fëënë/ [àfëë] 'lock'
/ø-këëgë/ [këëgë] 'squirrel'
/à-bëënë/ [àbëë] 'rain'
/à-bëë/ [àbëë] 'dance'

Phonologically, the final vowel of a lexical morpheme can show no other vocalic distinction other than tone. This final vowel is realized in several ways; thus, the choice of /o/ in the underlying structure may seem somewhat arbitrary. The phonetic vowel quality is completely predictable. In sentence-final position (and thus in isolation) the final vowel is realized as [ø] after voiced and nasal consonants:

(16) /ø-gùbë/ [øgùbë] 'hen'
/à-îëmë/ [àîëmë] 'blood'
/à-bërë/ [àbërë] 'fool'

The final vowel is also realized as [ø] after glottal stop or when there is no intermediate (C₂) consonant, if the preceding vowel is [+close]:

(17) /ø-bûë/ [bûë] 'chimpanzee'
/ø-fûë/ [fûë] 'mouse'

But it is identical with the preceding vowel (after glottal stop or when there is no C₂ consonant) if the preceding vowel is [-close]. Thus, the sequence /V₁/ is realized as V₁V₁, if V₁ is not close, and the two identical vowels are contracted in the phonetic output. We assume that /h-dâ/ has first become ḫ-dâ and finally by contraction [hâ]:

/à-íða/ [àíà] 'country', 'village'
In preconsonantal position, the final vowel is realized as [i] after voiced and nasal consonants, and also after glottal stop, if the vowel preceding the glottal stop is not close:

(19) /ŋ-g✉bɛ ʒ́-áɛ/ [ŋg✉bf ʒ́] 'the hen'
/ŋ-bɛɾɛ ʒ́-áɛ/ [ŋbɛrɛl ʒ́] 'the fool'
/ŋ-ɛɬɛɬ ʒ́-áɛ/ [ŋɛɬɛɬf ʒ́] 'the country'

The final vowel is identical with the preceding vowel directly after a vowel (and the two identical vowels are contracted in the phonetic output), and after glottal stop, if the vowel preceding the glottal stop is close:

(20) /ŋ-fú ɛwú-ɛɛ/ [fú ɛwá] 'the house'
/ŋ-dɛɛ ʒ́-ɛɛ/ [ŋɛɛl ʒ́] 'the house'
/ŋ-búʔɛ ɛwú-ɛɛ/ [búʔɛ ɛwá] 'the chimpanzee'

The final vowel is deleted after a nasal consonant. We assume that /ə/ has first become i before being deleted:

(21) /ŋ-ɛɬɛɛ ʒ́-áɛ/ [ŋɛɬɛɛl ʒ́] 'the blood'

Any Mankon lexical morpheme has therefore two surface forms (indicated as form A and form B) according to the environment. The difference is due to the presence or quality of the final vowel /ə/. A summary of all possibilities is presented below:

<table>
<thead>
<tr>
<th>Morpheme Structure</th>
<th>Example</th>
<th>Form A</th>
<th>Form B</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. V₁ close no C₂</td>
<td>-bfɛ</td>
<td>-biə</td>
<td>-bf</td>
<td>'hole'</td>
</tr>
<tr>
<td>2. V₁ non-close no C₂</td>
<td>-kyɛɛ</td>
<td>-kye</td>
<td>-kye</td>
<td>'basket'</td>
</tr>
<tr>
<td>3. V₁ close C₂ /ʔ/</td>
<td>-buʔɛ</td>
<td>-buʔə</td>
<td>-buʔu</td>
<td>'gorilla'</td>
</tr>
<tr>
<td>4. V₁ non-close C₂ /ʔ/</td>
<td>-tsaʔɛ</td>
<td>-tsaʔə</td>
<td>-tsaʔi</td>
<td>'top'</td>
</tr>
</tbody>
</table>
We have not indicated any tone markings on forms A and B, since the underlying tones are often subject to further modification by the tone rules of the language. Thus, in the following B forms of /fl-ŋ-tsâ?ə/ 'top',

(23) /fl-ŋ-tsâ?ə l-ff-ânə/  [flntsâʔə fə]  'my top'
    /fl-ŋ-tsâ?ə ff-âə/  [flntsâʔə t fə]  'the top'

it is noted that the stem tones are realized, respectively, as H-L and H-H.

This table summarizes different processes. Case 1-7 have form A in isolation and before non-close vowel, form B before consonant or close vowel. Case 8 has form A in isolation and before any vowel, form B before consonant. Case 7 has two forms B: [kʊŋ] before close vowel and [kʊŋ] or [kɔn] before consonant (cf. (14) above and discussion).

Two phonological problems are not explained:
1. /-bfə/ 'goat' should according to the rules be represented as [bfə] in form A and as [bi] in form B. In fact, form A is represented as [byɛ]. There are some of these morphemes, all with the structure -Clə or -Cəə.
2. Some morphemes are in sentence-final position followed by [ye]: namely all the morphemes with the structure C_lV_uə, in which V_1 is non-close, and with a tone on ə identical to the tone on V_1, and some morphemes with the structure C_lV_uC_2ə. [ye] follows only in

<table>
<thead>
<tr>
<th>Morpheme Structure</th>
<th>Example</th>
<th>Form A</th>
<th>Form B</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. V_l any C_2 voiced stop</td>
<td>-kɔbə</td>
<td>-kɔbə</td>
<td>-kɔbɨ</td>
<td>'belt'</td>
</tr>
<tr>
<td>6. V_l any C_2 nasal cons.</td>
<td>-bɨŋə</td>
<td>-bɨŋə</td>
<td>-bɨŋ</td>
<td>'dance'</td>
</tr>
<tr>
<td>7. V_l mid C_2 /n/</td>
<td>-kɔnə</td>
<td>-kʊŋə</td>
<td>-kɔn'kʊŋ</td>
<td>'bean'</td>
</tr>
<tr>
<td>8. V_l open C_2 /n/</td>
<td>-bənə</td>
<td>-bə</td>
<td>-bəN</td>
<td>'bag'</td>
</tr>
</tbody>
</table>
sentence final position and has the same tone as the preceding vowel, with a few exceptions in the case of \(C_1V_1C_2\) morphemes:

(24) \(/^{\text{a}}\text{-kwá}/ \quad [\text{akwáyé}] \text{ or } [\text{akwá}] \quad \text{'paste of yams'}

\(/^{\text{a}}\text{n}-\text{kár}-/ \quad [\text{aŋkárèyè}] \text{ or } [\text{aŋkárè}] \quad \text{'circle'}

\(/^{\text{a}}\text{n}-\text{tón}-/ \quad [\text{aŋtóyè}] \text{ or } [\text{aŋtò}] \quad \text{'pot'}

\(/^{\text{h}}\text{-kwíŋ}-/ \quad [\text{hkwiŋéyè}] \text{ or } [\text{hkwiŋè}] \quad \text{'mountain'}

3. **The Concord System of Mankon**

Mankon nouns are grouped in six singular and four corresponding plural classes, and in some single classes. Classes are indicated by a class number (corresponding with the Bantu number system) and a concord symbol consisting of a concord consonant and a tone. Where the concord symbols are identical (as in classes 8 and 10), a distinction has been made on the basis of the nominal prefix, characterizing nouns which pair with a different singular class.

(25) Number | Singular Concord | Number | Plural Concord
---|---|---|---
1 | w' | 2 | b'
3 | w | 6 | m'
5 | n' | 19 | f'
7 | z' | 8 | ts'
9 | z' | 10 | ts'

Broken lines indicate minority genders.

The nominal prefixes (which all have L tone) are listed in Table 1. The singular prefixes an- (cl. 1) and n- (cl. 3) are preserved in the plural, as well as the nasal after f- (cl. 19) and after m- (cl. 6 as plural of cl. 3, 9 or 19). The nasal prefix in classes 1, 9, and 10 has a complementary distribution with a prefix f- before a voiceless fricative:

(26) \(/^{\text{f}}\text{-fò}/ \quad [\text{fòyè}] \quad \text{'chief'} \quad \text{cl. 1}

\(/^{\text{f}}\text{-sá?è}/ \quad [\text{sà?è}] \quad \text{'hook', 'hooks'} \quad \text{cl. 9 and 10}
Table 1. Mankon Nominal Prefixes

<table>
<thead>
<tr>
<th>Number</th>
<th>Nominal Prefix</th>
<th>Example</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ø-</td>
<td>ø-sfŋ̃s</td>
<td>'bird'</td>
</tr>
<tr>
<td></td>
<td>n-</td>
<td>n-ldm̥a</td>
<td>'husband'</td>
</tr>
<tr>
<td></td>
<td>an-</td>
<td>an-g̊aɓe</td>
<td>'antilope'</td>
</tr>
<tr>
<td>2</td>
<td>bi-</td>
<td>bi-sfŋ̃s</td>
<td>'birds'</td>
</tr>
<tr>
<td></td>
<td>bi-</td>
<td>bi-ldm̥a</td>
<td>'husbands'</td>
</tr>
<tr>
<td></td>
<td>bi-</td>
<td>bi-àn-g̊aɓe</td>
<td>'antilopes'</td>
</tr>
<tr>
<td>3</td>
<td>i-</td>
<td>l-kɔɓe</td>
<td>'belt'</td>
</tr>
<tr>
<td></td>
<td>n-</td>
<td>n-ŋaŋ̃e</td>
<td>'root'</td>
</tr>
<tr>
<td>5</td>
<td>ni-</td>
<td>ni-bɔm̥e</td>
<td>'egg'</td>
</tr>
<tr>
<td>6</td>
<td>mi-</td>
<td>mi-kɔɓe</td>
<td>'belts'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mi-ŋaŋ̃e</td>
<td>'roots'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mi-bɔm̥e</td>
<td>'eggs'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mi-kɔɓe</td>
<td>'feet'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mi-h-tsাʔe</td>
<td>'tops'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mi-h-dz̃ŋe</td>
<td>'thorns'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mi-b6ʔe</td>
<td>'palmwine'</td>
</tr>
<tr>
<td>7</td>
<td>a-</td>
<td>a-tɗe</td>
<td>'head'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a-kɗe</td>
<td>'foot'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a-b6e</td>
<td>'hand'</td>
</tr>
<tr>
<td>8</td>
<td>i-</td>
<td>l-tɗe</td>
<td>'heads'</td>
</tr>
<tr>
<td>9</td>
<td>n-</td>
<td>h-dɑe</td>
<td>'house'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>h-dz̃ŋe</td>
<td>'thorn'</td>
</tr>
<tr>
<td>10</td>
<td>n-</td>
<td>h-dɑe</td>
<td>'houses'</td>
</tr>
<tr>
<td>19</td>
<td>fi-</td>
<td>fi-h-tsाʔe</td>
<td>'top'</td>
</tr>
</tbody>
</table>

6 This is realized as [ɓ̃ŋg̊aɓe] by a rule which will be discussed later. Cf. rule (45).

7 This is realized as [m보̱]. The nominal prefix mi- loses its vowel before a labial consonant, if the noun stem is monosyllabic. This rule may apply facultatively if the stem is plurisyllabic. Hence [mb̃m̥e] or [mɓɔm̥e] 'eggs'.
The nasal prefix of cl. 3 has not been found before a voiceless fricative, but the existence of a prefix *i-* in class 3 before other consonants does not permit us to regard *i-* as a conditioned variant.

All morphemes dependent on the head noun are preceded by a concord element which shows agreement with the head noun. These concord elements are summarized in Table 2. Column 1 contains concords of object pronoun, independent pronoun, interrogative pronoun, demonstrative pronoun, the numeral pronoun -iέ, and the relative pronoun. Column 4 is used for numerals and for the concord of "how many".

Where the concording element in Table 2 shows a difference in tone (as in columns 3, 4, 5, 6, 7 and 9), the concords of classes 1 and 9 have L tone, and those of all other classes H tone. There is still a concord-like element *á/á* preceding a class 1 object. *á/á* surfaces in the answer to a question about the object:

(27) /á lêną kê/ [á líńę kê] 'what has he looked for?'.

which may be:

(28) /á ȯ-kâŋê/ [á káŋê] 'a squirrel' or
 /á lêną ȯ ȯ-kâŋê/ [lêńę犒káŋê] 'He has looked for a squirrel.' (cl. 1)
 /á lêną bʸ-kâŋê/ [lêńę bỳkáŋê] 'He has looked for squirrels.' (cl. 2)

In all columns some vocalic distinctions between concords of different classes becomes evident. If all concords are taken together, four different vowel qualities are observed:

(29) /u/ ~ /i/ ~ /a/ ~ /e/ in class 1
 /u/ ~ /i/ in class 3
 /i/ ~ /a/ in classes 2, 5, 6, 8, 10, and 19
 /i/ in class 9
 /a/ ~ /e/ in class 7.

Per column a maximal distinction of three vowel qualities is found: 8

8 Column 10 is left out of consideration because of the variations in classes 1, 3, 7 and 9.
<table>
<thead>
<tr>
<th></th>
<th>Adj.</th>
<th>'other'</th>
<th>Num.</th>
<th>Subj. conc.</th>
<th>Subj. pron.</th>
<th>Poss. pron.</th>
<th>'all'</th>
<th>Ass.</th>
<th>'some'</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>wú-</td>
<td>wùn-</td>
<td>wùə</td>
<td>1-</td>
<td>å-</td>
<td>lwù-</td>
<td>1-</td>
<td>1-</td>
<td>wù-/l-</td>
</tr>
<tr>
<td>2</td>
<td>bf-</td>
<td>bæ-</td>
<td>bæə</td>
<td>bf-</td>
<td>f-</td>
<td>lbf-</td>
<td>b1-</td>
<td>bf-</td>
<td>bæ-</td>
</tr>
<tr>
<td>3</td>
<td>wú-</td>
<td>wù-</td>
<td>wùə</td>
<td>f-</td>
<td>f-</td>
<td>lwù-</td>
<td>1-</td>
<td>f-</td>
<td>wù-/l-</td>
</tr>
<tr>
<td>5</td>
<td>nf-</td>
<td>nà-</td>
<td>nàə</td>
<td>nf-</td>
<td>f-</td>
<td>lnf-</td>
<td>n1-</td>
<td>nf-</td>
<td>nà-</td>
</tr>
<tr>
<td>6</td>
<td>mf-</td>
<td>mà-</td>
<td>màə</td>
<td>mfn-</td>
<td>f-</td>
<td>lmf-</td>
<td>m1-</td>
<td>mf-</td>
<td>mà-</td>
</tr>
<tr>
<td>7</td>
<td>zá-</td>
<td>zà-</td>
<td>zàə</td>
<td>å-</td>
<td>å-</td>
<td>òzà-</td>
<td>å-</td>
<td>å-</td>
<td>zà-/å-</td>
</tr>
<tr>
<td>8</td>
<td>tsf-</td>
<td>tsà-</td>
<td>tsàə</td>
<td>f-</td>
<td>f-</td>
<td>ltsf-</td>
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<td>tsà-</td>
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<tr>
<td>9</td>
<td>zf-</td>
<td>zln-</td>
<td>zlə</td>
<td>1-</td>
<td>1-</td>
<td>lz1-</td>
<td>ln-</td>
<td>1-</td>
<td>zl-/l-</td>
</tr>
<tr>
<td>10</td>
<td>tsf-</td>
<td>tsà-</td>
<td>tsàə</td>
<td>f-</td>
<td>f-</td>
<td>ltsf-</td>
<td>f-</td>
<td>tsà-</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>ff-</td>
<td>fà-</td>
<td>fàə</td>
<td>ff-</td>
<td>ff-</td>
<td>lff-</td>
<td>ff-</td>
<td>fà-</td>
<td></td>
</tr>
</tbody>
</table>
(30) /u/, /i/, /a/ in columns 1, 2, 3 and the CV- part of 7,
    /i/, /a/ in columns 4, 5, 8, 9, and the V- part of 7,
    /i/, /a/ in column 6.

Some variations may be considered as conditioned variants. CV- and V- concords vary (cf. column 10), in which case Cu- varies with i- (classes 1 and 3), and Ca- with a- (class 7). The a- concords in column 6 are explained by their occurrence in sentence initial position. Thus, Ca- concords vary with a- in sentence initial position and a- in non-initial position. The display in (29) can therefore be simplified as follows:

(31) /u/ ~ /a/ in class 1
    /u/ ~ /i/ in class 3
    /i/ ~ /a/ in classes 2, 5, 6, 8, 10 and 19
    /i/ in class 9
    /a/ in class 7.

The vocalic variation in columns 5 and 6 of class 1 and 3 concords should be due to suppletion. The a- and a- concords are only found in the subject concord and pronoun. The vocalic variation in classes 2, 5, 6, 8, 10 and 19 is due to some unknown amalgamation in columns 2, 3 and 10, where /i/ changes to /a/, although the difference between these two vowels distinguishes classes 7 and 9. This is not the case in class 9, which keeps /i/.

The most important conclusion is that we can reconstruct four different vowel qualities in concords: /u/ (in classes 1 and 3), /a/ (in class 7 and the suppletive concord of class 1), /i/ (in class 9 and the suppletive concord of class 3), and an undefined vowel which surfaces as /a/ or /i/ (in classes 2, 5, 6, 8, 10 and 19). Further,

9 If there would be an exact parallel between Cu- and Ca- concords, we would expect the subject pronoun of classes 1 and 3 to be u-. We find instead a- in class 1 and i- in class 3. These will be regarded as replacive concords, if in sentence-initial position.
that these vowel qualities are reduced to a distinction between [+close] and [−close] in some environments (cf. columns 4, 5, 7, 8, 9 and 10 in Table 2). The actual quality of these reduced vowels is difficult to ascertain, because they never surface, but only their feature [close] is used in the vowel contraction rules.

The difference between CV- and V- concords can best be shown after a noun of the form /-C₁Vᵣnə/, like /à-bànə/ 'bag' (cl. 7). This noun changes to [àb̀ tên] before a vowel. The numbers indicate the concord columns:

(32) 1. /à-bànə zá-áê/ [àbàn dzà] 'the bag'
    /à-bànə zá-îô+tê-mô?ê/- [àbàn dzà+têmô?êyê] 'one bag'
2. /à-bànə zà-bànnê/ [àbàn dzàbànnê] 'a red bag'
3. /à-bànə zà-mô?ê/- [àbàn dzà+mô?êyê] 'another bag'
4. /à-bànə ô-mô?ê/- [àbê+mô?êyê] 'one bag'
5. /à-bànə ô-bànnô/ [àbê bànnô] 'the bag is red.'
6. /à-bànə e-zà-ànnê/ [àbê zê] 'my bag'
7. /à-bànə e-tsûmê/ [àbê tsûmê] 'all the bag'
8. /à-bànə ô kàñê/ [àbê kàñê] 'the bag of the squirrel'
9. /à-bànə zà-tsêê/ [àbàn dzàtsêyê] 'some bag'
   /à-bànə ô-tsêê/ [àbê tsêyê] 'some bag'

The quality of the vocalic concord can be ascertained by applying the rules for vowel contraction; see below. One will find nouns of the form A (cf. (12)) before a [−close] vocalic concord element, and B before a [+close] vocalic concord element or before a consonant initial concord element. Examples of different concords (numbered according to the columns in Table 2) for different classes are:

(33) 1. /ô-fôô wû-dê/ [fû wà] 'the mouse' (cl. 1)
    /l-bànə tsf-fê+f-sê,ê/ [lûàn tsfscê] 'how many bags?' (cl. 8)
2. /ô-tàmê wû-bànnô/ [àtêm wûbànnô] 'a red heart' (cl. 3)
4. **Vowel Contraction in Mankon**

Every noun in Mankon ends on a vowel of predictable quality and unpredictable tone (cf. discussion relative to (16)-(21) above). We shall not present tone rules in this paper, but shall rather concentrate on vowel quality. A noun can be followed by a concord element, which is often vocalic (see e.g. column 5 in Table 2). These vocalic concord elements cannot surface after a noun, because there is a phonetic constraint against long vowels and diphthongues. The vocalic concord elements can only show a distinction in the features \([\text{tone}]\) and \([\text{close}]\). In the preceding section we have shown that all other vocalic distinctions are lost as soon as the concord element changes from CV- to V- and the V- does not occur in the sentence initial position. An original four-way distinction in vocalic quality is in that case reduced to a distinction between \(+\text{close}\) and \(-\text{close}\). In the associative construction (column 9 in Table 2) this concord element might be followed by the vocalic nominal prefix of the following noun. This nominal prefix is always L, and shows in initial position a distinction between

(33) 3. \(/à-tiè zà-mô?à/-/ [àtî zâ°mô°yûyé] \quad \text{'another tree' (cl. 7)}

4. \(/î-bânë f-se?ë/ [îbê sê?ë] \quad \text{'how many bags?'}

5. \(/ó-bî?ë è-bânë/ [bê?ë bânë] \quad \text{'the termite is red.'}
   \(/n-bî?ë ë-bânë/ [mbHû bânë] \quad \text{'the goat is red.'}
   \(/n-bî?ë f-bânë/ [mtû bânë] \quad \text{'the goats are red.'}

6. \(/à bânë/ [ëbânë] \quad \text{'it (cl. 1) is red.'}
   \(/f bânë/ [ëtûbânë] \quad \text{'it (cl. 3) is red.'}

7. \(/à-bù?ë è-zá-ànë/ [ëbù?ë âzê] \quad \text{'my slave' (cl. 7)}
   \(/n-jù?ë l-zî-ànë/ [nhû?ë âzê] \quad \text{'my compound' (cl. 9)}

8. \(/ñ-gûnë ln-tsûmë/ [ngûnû ëntsûmû] \quad \text{'all the grass' (cl. 9)}

9. \(/ó-kwâgë ë ã-kâñë/ [kwyûl kâñë] \quad \text{'the scabies of the squirrel' (cl. 1)}

10. \(/ó-fûë wû-tséë/ [fû wûtûsêyê] \quad \text{'some mouse' (cl. 1)}
    \(/ó-fûë ë-tséë/ [fû tsêyê] \quad \text{'some mouse' (cl. 1)}
    \(/à-tiè zà-tséë/ [àtî zûtsêyê] \quad \text{'some tree' (cl. 7)}
    \(/à-tiè ë-tséë/ [àtîê tsêyê] \quad \text{'some tree' (cl. 7)}
and a-. One may therefore find in the underlying structure sequences of three vowels, the first one of which does not show a vocalic distinction, and the last two only distinguish between [+close] and [-close]. These three vowels are contracted, the result being a form A or B of the first noun (see (22)). The forms A or B differ in the feature [close] of their final vowel only. Form A is in any case used in the sentence final position, form B before consonant in the underlying structure. The distribution of forms A and B before an underlying vowel will be studied hereafter.

We start with examples of morphemes the C₂ of which is a nasal (cf. case 5 in (22)), where the difference between the two forms is expressed in one or two syllables and therefore very obvious:

(34) /æ-ɦnæ + ɑ + l-bəɾə/ [æfnæ bəɾə] 'the locks of the fools'
/ʃ-ɦnæ + ʃ + l-bəɾə/ [ʃfnæ bəɾə] 'the locks of the fools'
/æ-ɦnæ + ɑ + æ-ɓəɾə/ [æfnæ bəɾə] 'the lock of the fool'
/ʃ-ɦnæ + ʃ + æ-ɓəɾə/ [ʃfnæ bəɾə] 'the locks of the fool'

This set of examples shows that the quality of the associative marker has no influence, only the quality of the nominal prefix of the second noun. We therefore suppose that the feature [close] of the last vowel to be contracted determines the feature of the contracted vowel. This rule is confirmed by associative constructions in which the last noun has a zero prefix, and the closeness of the associative marker should therefore be important:

(35) /æ-ɦnæ + ɑ + ø-kæŋə/ [æfnæ kæŋə] 'the lock of the squirrel'
/ʃ-ɦnæ + ʃ + ø-kæŋə/ [ʃfnæ kæŋə] 'the locks of the squirrel'

Here the associative marker is the last vowel to be contracted and determines accordingly the closeness of the contracted vowel.

Up till now we have assumed that the vocalic quality of the associative marker is known, and that the lexicon of the native speakers contains Table 2. A vocalic associative marker never surfaces. We
have in fact deduced the underlying vocalic quality from the rules for vowel contraction. The application of the rules mentioned above has forced us to set up a vocalic associative marker with [+close] or [-close] quality. The surface forms are:

\[
\begin{align*}
\text{class 1} & \quad [kəŋ_kəŋə] \quad \text{'the squirrel of the squirrel'} \\
\text{class 3} & \quad [məŋ_kəŋə] \quad \text{'the nut of the squirrel'} \\
\text{class 7} & \quad [əfəŋə kəŋə] \quad \text{'the lock of the squirrel'} \\
\text{class 8} & \quad [əfəŋ kəŋə] \quad \text{'the locks of the squirrel'} \\
\text{class 9} & \quad [ŋəm̥ kəŋə] \quad \text{'the animal of the squirrel'} \\
\text{class 10} & \quad [ŋəm kəŋə] \quad \text{'the animals of the squirrel'}
\end{align*}
\]

We deduced from these examples that the associative markers of classes 1 and 9 have L tone (and therefore do not show a tonal influence on the LL stem kəŋə), and that the markers of all other classes have H tone. Further, that the associative marker of class 7 is [-close] (giving rise to form A), while all the other associative markers are [+close] (giving rise to form B). We therefore set up the underlying associative markers as:

\[
\begin{align*}
\text{class 1} & \quad /l/ \quad \text{or} \quad [+\text{close}, -\text{H}] \\
\text{class 3} & \quad /l/ \quad \text{or} \quad [+\text{close}, +\text{H}] \\
\text{class 7} & \quad /ə/ \quad \text{or} \quad [-\text{close}, +\text{H}] \\
\text{class 8} & \quad /l/ \quad \text{or} \quad [+\text{close}, +\text{H}] \\
\text{class 9} & \quad /l/ \quad \text{or} \quad [+\text{close}, -\text{H}] \\
\text{class 10} & \quad /l/ \quad \text{or} \quad [+\text{close}, +\text{H}] \\
\end{align*}
\]

The exact vocalic quality of the vocalic marker has been chosen rather arbitrarily as /i/ or /ə/. The feature specification in (37) seems more exact.

The schema in (22) distinguishes several nominal structures. We illustrated only case 6 with final nasal consonant. Here we will illustrate also the other cases with an associative marker of class 1 /l/ opposed to one of class 7 /ə/.
(38) Associative marker of class 1:

[\text{kan} \ \text{kant}] 'the squirrel of the squirrel'
\[\text{fu} \ \text{kant}] 'the mouse of the squirrel' \ (V_1 \ close, \ no \ C_2)
\[\text{langwe} \ \text{kant}] 'the split-bamboo of the squirrel' \ (V_1 \ non \ close, \ no \ C_2)
\[\text{bun} \ \text{kant}] 'the chimpanzee of the squirrel' \ (V_1 \ close, \ C_2 /l/)
\[\text{wa?} \ \text{kant}] 'the blade of the squirrel' \ (V_1 \ non \ close, \ C_2 /l/)
\[\text{fuyl} \ \text{kant}] 'the sack of the squirrel' \ (V_1 \ any, \ C_2 \ voiced \ stop)

(39) Associative marker of class 7:

[\text{af?} \ \text{kant}] 'the lock of the squirrel'
\[\text{abl} \ \text{kant}] 'the profit of the squirrel' \ (V_1 \ close, \ no \ C_2)
\[\text{atse \ kant}] 'the lineage of the squirrel' \ (V_1 \ non \ close, \ no \ C_2)
\[\text{abu1} \ \text{kant}] 'the slave of the squirrel' \ (V_1 \ close, \ C_2 /l/)
\[\text{atla1} \ \text{kant}] 'the country of the squirrel' \ (V_1 \ non \ close, \ C_2 /l/)
\[\text{adzu a kant}] 'the bowls of the squirrel' \ (V_1 \ any, \ C_2 \ voiced \ stop)

The rules required to produce these results can be relatively simple, but pose some interesting problems. We informally formulated a rule on p. 44 as

(40) The feature close of the last vowel to be contracted determines the closeness of the contracted vowel.

This rule can be formulated in different ways. One can assimilate a sequence of vowels to the closeness feature of the last one before the vowels are contracted. Or one can delete all preceding vowels. In both formalizations one runs into difficulties if the preceding morpheme is of the type /CV_1a/. Yo give one example:

(41) /\text{a-b}l\text{e} + \text{s} + \text{a-kant}/ 'the profit of the squirrel'

should not become *[\text{a-b}l\text{e} \ \text{kant}] (via /\text{a-b}l\text{e} + \text{s} + \text{a-kant}/ or directly by deletion), but [\text{abl} \ \text{kant}]. The assimilation or deletion should be stopped before it attacks V_1 (the stemvowel). The only difference between V_1 and the final vowel a (given the fact that one does not want
to use final word boundary here) seems to be the reduced nature of the final vowel. If the deletion applies only to reduced vowels, one first needs a rule which reduces all vowels following a reduced one:

(42) \[ V \rightarrow [+\text{reduced}] / [+\text{reduced}] \_\_ C \]

(to apply from left to right),

where the ad hoc feature [+reduced] destroys all vocalic features except [tone] and [close].

This rule can explain many phenomena in Mankon. The nominal prefix of class 7 is à- (e.g. à-bërê). If this noun follows another morpheme (e.g. in the associative construction), the feature [+open] of the nominal prefix is lost, so that the prefix in fact becomes something like ã- (cf. the two last examples in (34)). The same phenomenon is observed in Table 2, where all a- prefixes in class 1 (suppletive concord) and 7 vary with e- prefixes. The feature [+open] is only preserved after a consonant (e.g. za-) or where no preceding morpheme is found (in column 6), to wit in all positions where a preceding reduced vowel cannot intervene. The rule finds strong motivation if it would explain the vocalic variation in Table 2. Rule (42) would in fact destroy the features [low] and [back] of all vowels following a reduced vowel and would therefore leave [−close] in the place of /a/ and [+close] in the place of /i/ and /u/. The only problem is the subject pronoun (column 6) of class 3, which should be *u, because no reduced vowel precedes. If we accept in this case also a replacive concord i- (like the replacive concord of class 1), the problem seems to be solved. The four vowels enumerated in (29) could now be stated (given the existence of rule (42) as:

(43) /u/ or replacive /a/ (columns 5 and 6) in class 1
    /u/ or replacive /i/ (columns 5 and 6) in class 3
    /i/ in class 9
    /a/ in class 7
    /i/ in classes 2, 5, 6, 8, 10 and 19.
The last vowel /ɪ/ is problematic. It is obvious that a distinction should be made between this vowel and the vowel of class 9: the vowel of class 9 is always the same, while the vowel of classes 2, 5, 8, 10 and 19 changes to /a/ in columns 2, 3 and 10 of Table 2. We hope to address ourselves to this problem in a later paper.

The contraction rule should be formalized as:

\[
\begin{align*}
V \quad V \\
[+\text{reduced}] & \rightarrow \emptyset / \_ \_ \_ [+\text{reduced}] C \\
\text{(to be applied from right to left).}
\end{align*}
\]

Here again we run into a problem: /mˌdzənə + mf + ə-bəɾə/ 'the urine of the fool' is realized as [mldzem mbəɾə]. Rule (42) has not applied, and therefore the feature [+low] of the prefix ə- has not been destroyed. But the same kind of deletion applies: [−reduced] vowels are also deleted before a [−reduced] vowel. One should therefore generalize rule (44) in the following way:

\[
\begin{align*}
V \quad V \\
[a \text{ reduced}] & \rightarrow \emptyset / \_ \_ \_ [a \text{ reduced}] C.
\end{align*}
\]

The other rules need less discussion and are more straightforward. One should have a rule which makes the reduced final vowel of a morpheme [+close] if immediately followed by a consonant:

\[
\begin{align*}
V \\
[+\text{reduced}] & \rightarrow [+\text{close}] / V (C) \_ \_ C.
\end{align*}
\]

This rule converts /h-ʒəmə + zf-əə/ 'the axe' into /h-ʒəmf + zf-əə/ and finally into [hdzəm zə] (form B of (22)). We use here a rule which deletes a [+close] vowel after a nasal consonant, a rule not formalized in this paper.

Then there should be a rule which creates identical vowels (V₁) after vowel or glottal stop, if the closure features are identical:

\[
\begin{align*}
V \\
[a \text{ close}] & \rightarrow V₁ / [a \text{ close}] (?) \_ \_ C.
\end{align*}
\]

This rule converts /ə-bəə + ə + ə-bəɾə/ 'the profit of the fools' into
The phonetic constraint against long vowels reduces \[\text{I}\] to \(\text{i}\). This rule produces in one case the wrong result, to wit in the case of \([-\text{close}] [+\text{close}]\), where the last vowel also develops into an identical vowel, but not by rule (47). So we will finally need one more rule which will not be formalized in this paper.

One final example should be sufficient to demonstrate the derivation. Reduced vowels are underlined:

\[(48) \quad /\text{-sfn} \text{é} \ w\text{-f} \text{é} + i-\text{mōs\n}\hat{\text{g}}\text{é}/ \quad \text{\textquoteleft one bird\textquoteright} \]

\[\text{after rule 42} \]

\[\text{i} \quad \text{after rule 46} \]

\[\text{Ø} \text{Ø} \quad \text{after rule 45} \]

\[\text{Ø} \quad \text{non-formalized (see p.145)} \]

\[\text{I} \quad \text{after rule 47} \]

\[\text{[ sfn wī mōs\n}\hat{\text{g}}\text{é]} \quad \text{finally} \]

5. Discussion

The rules proposed in the preceding section certainly have wider application than just in the concord system. The verb system has not been explored systematically, but we observed the following facts:

\[(49) \quad [bē mā zē dzōnō] \quad \text{\textquoteleft I can steal a giant\textquoteright} \]

\[\text{[bē mā zē dzōnō]} \quad \text{\textquoteleft Can I steal a giant?\textquoteright} \]

\[\text{[bē mā zē bī?ō]} \quad \text{\textquoteleft I can steal a termite\textquoteright} \]

\[\text{[bē mā zē bī?ī]} \quad \text{\textquoteleft Can I steal a termite?\textquoteright} \]

The difference can only be explained if one accepts a vocalic question marker with the feature \([+\text{close}]\) at the end of a question. The other vocalic qualities cannot be recovered as far as we know. This question marker is the first item to enter the Mankon lexicon as an underspecified vowel and would prove that other vocalic features than [tone] can lead a floating existence.\(^{10}\)

\(^{10}\)This is an important observation in the debate about suprasegmental phonology. One of the arguments of Will Leben is that tone should be handled differently from other vocalic features, because it is the only feature which can "float".
In the case of vocalic concord markers, it is less clear. It seems quite possible that the speakers have by analogy some idea about the original vocalic quality of the concord element. The replacive concord in class 1, however, makes analogical reasoning difficult. Compare the following concords of class 1:

(50) Associative marker [+close, -H] (column 9)
    Subject concord [-close, -H] (column 5)
    Object concord [-close, +H]

Analogy with the object pronoun /ã/ and the object concord in sentence initial position /ã/ (cf. 28) may help the speakers to guess the underlying vocalic quality. They should know in this case that the associative marker keeps the 'original' concord, while the others use replacive concords.

The comparison between Mankon and more Eastern Mbam-Nkam languages is interesting (cf. section 1). The great number of floating tones in, e. g., Bangangté can be traced back to Mankon vowels and vocalic morphemes. The final vowel of Mankon lexical morphemes is in most cases realized (although on a vowel of predictable quality). In Bangangté it is only realized before a pause if the vowel is H and preceded by a consonant. In other Eastern languages it is never realized. Its tone is preserved in Mankon and Bangangté, but not in all other dialects. The complex set of nominal prefixes in Mankon (cf. Table 1) is reduced to a simple homorganic nasal in Bangangté, but the L tone of these prefixes is preserved as a floating tone. Even the zero prefix of Mankon (in part of class 1) is matched by the absence of a floating L tone in some Eastern languages.\footnote{This has been shown by Gabriel Nissim in his contribution "Les classes nominales dans quelques parlers bamiléke", to appear in Larry M. Hyman and Jan Voorhoeve (eds.), Noun Classes in Grasslands Bantu. Paris: S.E.L.A.F. (forthcoming).}

The comparison of Mbam-Nkam languages shows a process of vowel reduction. The features [tone] and [close] are the most resistant to total
deletion in this order. Mankon already shows an intermediate stage in which the feature [+close] may already float. The quality of the underlying vowel is hardly recoverable, and the closeness distinction has already become lost in the final vowel of the lexical morpheme.\footnote{One could argue that this final vowel is always [-close] in the underlying representation. One takes in that case the isolated form as being closest to the underlying form. But one could as well start from a [+close] final vowel and have a rule which changes this feature into [-close] before pause or a [-close] vowel. I really do not think that the underlying feature [close] is recoverable. It would always be an arbitrary choice between [+close] or [-close].}

Vowel reduction is not a completely new phenomenon in Mbam-ñkam languages. Lexical morphemes in Proto Bantu (PB) use seven vowels /i e ø a o u/, while concord elements only use four /i e a u/. Nominal prefixes in PB lost their tonal distinction and are always L. In Mankon, lexical morphemes use nine vowels (cf. (12)). It is very difficult to distinguish the vowels of concord elements. We recovered four vowel distinctions (cf. 29 and 31), which have rather arbitrarily been set up in (43) as /u i ø a/. Their correspondence to PB concords is not always clear:

\begin{table}
\begin{tabular}{ccc}
\textbf{Class} & \textbf{PB} & \textbf{Mankon} \\
1 & jo, a & wu, a \\
2 & ba & bi \\
3 & go & wu, i \\
5 & de/di & ni \\
6 & ga/ma & ni \\
7 & ke & za \\
8 & bi & tsi \\
9 & je & zi \\
10 & di & tsi \\
19 & pi & fi \\
\end{tabular}
\end{table}

In setting up the PB concords, we already assumed that the close vowel of the class 5 nominal prefix and the nasal of the class 6 nominal prefix is found in the concord (which is a derivation from the PB situation).
If this assumption is accepted, PB a and i correspond to Mankon i (except in the replacive vocalic concord of class 1), PB e to Mankon i or a, and PB o to Mankon u. The Mankon class 7 concord za poses a problem. The PB concords of classes 7 and 9 (*ke and *je) show the same vowel and different consonants, the corresponding concords in Mankon (za and Zt) show the same consonant and different vowels. We cannot explain this anomaly. Mankon concords only use a distinction between u and i (often neutralized to i, cf. Table 2), except in class 7 and in the replacive concord of class 1. One could therefore state that the range of vocalic possibilities in Mankon lexical morphemes is widened, but reduced in Mankon concords.

REFERENCES


STRATEGIES IN CONSTRUCTING A DEFINITE DESCRIPTION:
SOME EVIDENCE FROM KINYARWANDA

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1. Introduction

It is generally agreed that adjective and relative-clause modifiers in definite noun phrases help to establish unique referents for the noun phrases. We may refer to this as the establishment of a definite description. Definite description is achieved when the speaker has sufficiently modified the head noun so that the referent can be identified by the hearer. Presumably, no further modification is then added. That is, if a single modifier is judged by the speaker to have established the unique referent, no further modification is required. If the definite description has not been achieved, the speaker must repeat the application of the description mechanism to further restrict the range of possible referents. Restrictive modification often consists of information known to both speaker and hearer through previous discourse or through common knowledge about the real world. The speaker can presumably call upon any of this information to identify the individual (or group) he wishes to refer to. If a second (or third, etc.) modifier is necessary, it may appear with or without a conjunction, or, alternatively, with or without an intonational marker. If a conjunction or intonational marker is utilized, we may refer to the restrictive modifiers as conjoined; if no conjunction or intonational marker is utilized, we may refer to them as stacked.

Most past discussion of recursive modification of this type was restricted to rather gross points of syntax, for instance, whether two different syntactic configurations in the deep structure were warranted (cf. Stockwell, Schachter, & Partee [1973], Thompson [1970],

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1 We wish to acknowledge Dr. Talmy Givón not only for his extensive review and criticism of the original draft of this paper, but also for his initial encouragement of our investigation of this area and for his insightful consideration and discussion of the data.
Walusimbi and Givón [1970]). It has been noted, though, (in the above-mentioned works and also in Givón [1972]) that a change of the relative order of adjectives (or in the case of English, a change in the relative stress) does not change the unique referent of the modifiers, but rather does result in a change of the strategy for definite description. Thus, (1) below:

(1) the **big** red house

is properly used when there are a number of red houses, only one of which is big. Alternatively, (2):

(2) the big **red** house

would be used when there are a number of big houses and only one is red. These contrasts are indicated by stress in English (because of the often-rigid adjective order), but would be indicated in Bantu languages by ordering of the adjectives: the last modifier functions as the one more heavily stressed. Modifiers in a stacked construction, therefore, exhibit different relationships to the rest of the discourse, and their ordering, or relative stress, is inextricably related to aspects of the discourse. It is normally assumed that switching the order or stress placement of conjoined restrictive modifiers does not involve emphasis change of this same type. Thus, in English, if a comma were used to indicate an intonational break (as in (3)) it would be odd and would be contrastive in a very different way from (2).

(3) ?the big, **red** house

Example (3) would probably be used only to correct misinformation, for example, if (4) were mistakenly used:

(4) the big blue house

Example (3) does not show the type of relationship to the discourse context that (2) does.

Some previous writers have attempted to account for the semantic implications of ordering constraints on restrictive modifiers. These
discussions have generally been restricted to the often rigidly-ordered English adjectives. For instance, Vendler [1963] observed that certain semantic restrictions obtained when several (restrictive) adjectives modified the same noun. Gruber [1967] has contended that these semantic restrictions involve the hierarchy of semantic features, so that modifiers involving 'more general' (or 'higher') features come closer to the noun in English, while those involving 'more specific' (or 'lower') features come further away from it. The data reported in this paper in some sense confirm this observation in showing that these features seem to be relevant also for KinyaRwanda. This paper presents an attempt to elaborate on Gruber's observation and to extend it to cover a wider universe of restrictive modifiers, including also locative phrases and relative clauses. We will attempt to show how, in addition to some kind of 'hierarchy of generality', other considerations, some pragmatic and some syntactic, contribute to the construction of definite description. We will also contend that the hierarchy of generality represents a 'rule of economy' whereby the speaker narrows the domain in definite description by beginning with the most general information and only goes as far towards specificity as is necessary to establish unique reference.

2. Adjectives and Relative Clauses in KinyaRwanda

In KinyaRwanda, as in all Bantu languages, the category adjective is formally distinct from relative clause. The distinction is both morphological and syntactic. In the morphology, the agreement prefix of adjectives, for noun classes with the underlying NV- morphemes (such as mu-, mi-, ma-, N), is the same as for the noun (as in (5a) and (5b)), while that of verbals (including relative clauses) is not (as in (6a) and (6b)):²

(5) a. umuğaбо ni mu-nini 'The man is big.'
   b. umuğaбо mu-nini 'the big man'

(6) a. umuğaбо yaa-giye 'The man left.'
   b. umuğaбо wa-giye 'the man who left'

²KinyaRwanda is a tone language but since tone is irrelevant to the topic under discussion it is not marked.
Syntactically, when adjectives are embedded as modifiers both the copular element ni and any tense/aspect carried by it are lost. But if the implication is that the property in question was characteristic only temporarily, a suppletive conular form with the tense/aspect is retained:

(7) a. umugabo ya-ri mŋ-iiza 'The man was good.' (but isn't now)
    b. umugabo wa-ri mŋ-iiza 'the man who was good' (but isn't now)

The adjective category in KinyaRwanda is very restricted and includes only eight members:

(8) -iiza 'good'    -bisi 'unripe'
    -bi 'bad'     -to 'small'
    -gufi 'short' -nini 'big'
    -rere 'tall'  -ça 'new'

These may all be classified as inherent properties (-bisi and -ça are inherent in the sense that items are "originally" unripe or new and "acquire" ripeness or age). Inherent properties occur as noun modifiers in two other ways as well. There is the possessive-type construction:

(9) inzu yumutuku
    house of-redness
    'the red house'

and the relative clause-type construction:

(10) ǐgitało kiremereye³
    book heavy
    'the book which is heavy'

In addition, this language also allows derivations of states from verbal events or actions, so that acquired permanent properties such as broken, dead, bent, burnt, etc. formally appear as verbal modifiers. These distinctions are important since they allow us to distinguish the syntactic from the semantic ordering strategies for separate assessment.

³[ŋ] = voiced palatal stop; [k] = voiceless palatal stop.
Hierarchies and Strategies in the Ordering of Adjectives

KinyaRwanda allows variant order of 'stacked' restrictive adjectives. The function of the ordering is potentially similar to that of contrastive stress in English:

(11) a. umugaso munini mjiiza 'the good big man'
    b. umugaso mjiiza munini 'the good big man'

Conjoined adjectives do not present this contrast:

(12) a. umugaso munini kaandi mjiiza 'the big and good man'
    b. umugaso mjiiza kaandi munini 'the good and big man'

While orders (11a) and (11b) are both acceptable in some cases, speakers have definite order preferences. This may be exemplified in the following contrast:

(13) a. umugaso wiraBura wumurgwaayi n'umutxwaare man of-blackness of-sick is-chief 'The black man who is sick is the chief.'
    b. umugaso wumurgwaayi wiraBura n'umutxwaare man of-sick of-blackness is-chief 'The sick man who is black is the chief.'

The order in (13a) is the most natural one, i.e.:

(14) inherent property + temporary condition.

In fact, the interpretation most readily assigned to the order in (13b) is that the man is a chronic invalid, in other words, permanently/inherently sick. Another context in which (13b) would be acceptable is if the topic of previous discourse were 'sick men', and the speaker identified the chief as the black one. Thus, the strategy for achieving emphasis (as in (11)) or that illustrating a real-world or discourse fact (as in (13b)) may over-rule the unmarked hierarchy given in (14).

Similarly, consider the contrast:

(15) a. ikuma kinini Kavunitse Kiri kumeeza knife big broken is on-table 'The big knife that is broken is on the table.'
The order in (15a) is again the preferred one, with the inherent property of size preceding the newer (or acquired) condition of being broken. But again, in a situation where a number of knives under discussion are broken, but only one is big, (15b) exhibits the preferable ordering.

As can be seen above, discourse-pragmatic considerations seem to interfere with the basic semantic hierarchy for determination of adjective order. To separate the two, in the following examples the adjectives are presented in the predicate, where they are considered new information and thus independent of any prior discourse.

(16) a. kumeeza hari iğiţabo Kinini giça on-table is book big new
'On the table there is a big new book.'

b. ?kumeeza hari iğiţabo giça Kinini on-table is book new big

(17) a. kumeeza hari iğiţabo Kinini giškwanutse on-table is book big torn
'On the table there is a big torn book.'

b. ?kumeeza hari iğiţabo giškwanutse Kinini on-table is book torn big

(18) a. muburiri hari umŋaana munto urŋwaaye on-bed is child small sick
'On the bed there is a small sick child.'

b. ?muburiri hari umŋaana urŋwaaye munto on-bed is child sick small

(19) a. kumeeza hari iğiţabo Kinini Kumutuku on-table is book big of-redness
'On the table there is a big red book.'

b. ?kumeeza hari iğiţabo Kumutuku Kinini on-table is book of-redness big

(20) a. kumeeza hari iğiţabo Kumutuku gišaaze on-table is book of-redness used
'?On the table there is a red used book.'

b. ?kumeeza hari iğiţabo gišaaze Kumutuku on-table is book used of-redness
The hierarchy suggested by these data is:

(21) size + color + acquired or non-inherent physical condition

The force of this hierarchy is even more striking when three adjectives modify the noun in the same construction:

(22) a. kumeeza hari iğitažo Kinini Kumutuku gišaaže
    on-table is book big of-redness used
    'On the table there is a big red used book.'

    b. *kumeeza hari iğitažo Kumutuku gišaaže Kinini

    c. *kumeeza hari iğitažo gišaaže Kumutuku Kinini

(23) a. kumeeza hari iğitažo Kumutuku gišaaže Kiremerye
    on-table is book of-redness used heavy
    '?On the table there is a red used heavy book.'

    b. *kumeeza hari iğitažo Kiremerye Kumutuku gišaaže

    c. *kumeeza hari iğitažo Kiremerye gišaaže Kumutuku

(24) a. kumeeza hari iğitažo Kumutuku gišaaže giheenda
    on-table is book of-redness used expensive
    '?On the table there is a red used expensive book.'

    b. *kumeeza hari iğitažo giheenda Kumutuku gišaaže

Thus the hierarchy in (21) may be further extended to:

(25) size + color + acquired physical condition + unobservable property

While this hierarchy clearly depends on ill-defined concepts, such as 'observable', we would like, nevertheless, to suggest that there does exist a hierarchy based upon judgements concerning degree of generality. The properties of an object which are obvious upon casual visual inspection are classified by speakers as in some sense more general than unobservable properties (e.g., expensive) and are therefore likely to be ordered first. Also, when an acquired physical property (e.g., broken, torn) is to be used in the description along with an "originally" inherent property (e.g., big, red), the acquired property follows the originally inherent one. The acquired condition is considered less general. The less visually obvious properties or the acquired physical properties are included in the description only when the use of the more general modifiers has failed to establish a unique referent. The
speaker proceeds from the general to the specific in building the definite description. Since size does not seem to be in any way more general than color we suggest that perhaps the size + color ordering is determined by the form of the word. An adjective precedes a possessive-type modifier, and colors happen always to be of the possessive type.

Now let us briefly return to examples (13) and (15). We have suggested that the discourse condition under which the 'semantic' hierarchy of properties is overruled is when the entire group under discussion possesses the 'more specific' property, but only one individual possesses the 'more general' one. This is, in actuality, the same principle expressed by the semantic hierarchy, except that in certain contexts the property that is normally regarded as 'more specific' is considered the more general one. In these cases the normally-general property is actually the specific, distinguishing characteristic. The apparent violation of the hierarchy thus actually confirms the general principle, which may now be formulated as:

(26) In the construction of definite descriptions, speakers will tend to proceed from the general to the specific. This order of increasing specificity requires that generally-known or observable characteristics of the referent are listed before characteristics requiring more esoteric knowledge of an individual or more careful inspection of an item.

4. Strategies in Ordering Adjectives, Locative Phrases, and Relative Clauses

In section 3 we disregarded the distinction between lexical adjectives and verb-derived modifiers which would be classified syntactically as relative clauses. In the data above the syntactic category remained irrelevant to the ordering constraint (except possibly for the size + color order). In this section we will discuss modification strategies which seem to rely upon syntactic information. We will look at the ordering of three types of modifiers: adjectives, locative phrases, and relative clauses. We will show that, basically, the same type of hierarchy governs the modifier ordering, although in places only the syntactic properties are relevant.
The first condition we notice is that adjectives and restrictive relative clauses modifying the same noun may not be conjoined. They may occur only in a 'stacked' configuration:

(27) a. ikuma kinini kaateemye inyama Kiri kumeeza
    knife big that-past-cut meat is on-table
    'The big knife that cut the meat is on the table.'

    b. *ikuma kinini kaandi kaateemye inyama Kiri kumeeza
       knife big and that-past-cut meat is on-table

The same restriction holds with respect to adjectives and locative phrases:

(28) a. umugabo muremure uri hano n'umutxwaare
    man tall that-is here is-chief
    'The tall man who is here is the chief.'

    b. *umugabo muremure kaandi uri hano n'umutxwaare

The grammatical function of the head noun in the relative clause makes no discernible difference. Thus:

(29) a. umugabo munini umugore yaaboonye n'umutxwaare
    man big woman that-past-see is-chief
    'The big man that the woman saw is the chief.'

    b. *umugabo munini kaandi umugore yaaboonye n'umutxwaare

(30) a. umugabo munini umuhuu'ugu yaahaaye ijiitaabo n'umutxwaare
    man big boy that-past-give book is-chief
    'The big man to whom the boy gave the book is the chief.'

    b. *umugabo munini kaandi umuhuu'ugu yaahaaye ijiitaabo n'umutxwaare

Adjectives, locative phrases, and relative clauses not only may not occur together as conjoined, they also may not occur in variant order. There are strict order conditions. Adjectives must precede relative clauses:

(31) a. umugabo muremure uriho ugeenda n'umutxwaare
    man tall who-is who-walk is-chief
    'The tall man who is walking away is the chief.'

    b. *umugabo uriho ugeenda muremure n'umutxwaare
This adjective + relative clause order is maintained regardless of the grammatical function of the head noun in the relative clause. Thus:

(33) a. umugaBo munini umuhuungu yaaBoonye n'umutxwaare man big boy that-past-see is-chief 'The big man that the boy saw is the chief.'

b. *umugaBo umuhuungu yaaBoonye munini n'umutxwaare

The non-conjoinability and strict order conditions may be ignored only when the relative clause characterizes a habitual/generic activity. In this case the adjective and the relative clause may be conjoined and there may be order variation:

(34) a. umugaBo muremure uririimba n'umutxwaare man tall who-sings is-chief 'The tall man who (always) sings is the chief.'

b. umugaBo muremure kaandi uririimba n'umutxwaare man tall and who-sings is-chief 'The man who is tall and who (always) sings is the chief.'

(35) a. umugaBo uririimba muremure n'umutxwaare man who-sings tall is-chief 'The man who (always) sings who is tall is the chief.'

b. umugaBo uririimba kaandi muremure n'umutxwaare man who-sings and tall is-chief 'The man who (always) sings and who is tall is the chief.'

(36) a. umugaBo muremure uguriša imbuto n'umutxwaare man tall who-sells fruit is-chief 'The tall man who (always) sells fruit is the chief.'

b. umugaBo muremure kaandi uguriša imbuto n'umutxwaare man tall and who-sells fruit is-chief 'The man who is tall and who (always) sells fruit is the chief.'

(37) a. umugaBo uguriša imbuto muremure n'umutxwaare man who-sells fruit tall is-chief 'The man who (always) sells fruit who is tall is the chief.'

b. umugaBo uguriša imbuto kaandi muremure n'umutxwaare man who-sells fruit and tall is-chief 'The man who (always) sells fruit and who is tall is the chief.'
In situations where an individual's activities can serve to identify him (such as, e.g., (34)-(35), the person is known as 'a singer' in a community) they are evidently considered as equal in generality to physical characteristics. This is illustrated by the conjoinability of the modifiers in the (b) examples of (34)-(37). Obviously they are not conjoined by virtue of identical syntactic structures, but rather, we claim, by equal descriptive "power". Item (35a), for instance, would be used in a situation where the habitual activity were judged by the speaker to be a more general modifying characteristic than even the height of the individual.

Since adjectives usually express inherent qualities, and relative clauses (excluding, for the moment, those with stative or generic verbs) usually express time-bound specific events, the adjective + relative clause order condition actually illustrates the general-to-specific description strategy. And evidently only elements of the same degree of generality may be conjoined (as two adjectives in the previous section, or two relative clauses, as we will see below). These facts might be explained by a purely syntactic condition which required the particular ordering and prohibited conjunction unless the two conjuncts were of the same form. In this way examples (34)-(37) would be exceptions. If we realize, however, that the apparent syntactic condition is actually a manifestation of the general-to-specific strategy, (34)-(37) provide a consistent argument in favor of the hypothesis.

Next it can be shown that locative phrase modifiers also participate in conditions on ordering. The preferable order is still with the adjective first, though the order locative + adjective is possible and slightly more acceptable than the order relative clause + adjective. Thus:

(38) a. umugaba muremure uri hano n'umutxwaare
    man tall who-is here is-chief
    'The tall man who is here is the chief.'

b. umugaba uri hano muremure n'umutxwaare
    man who-is here tall is-chief
The less preferred order in (38b) may be considered acceptable in the proper context, namely, in this case, when many men are here but only one is tall. That is, the reverse order, locative + adjective, is possible when the locative expresses the more general information, in the discourse situation, than does the adjective. Locative phrases, therefore, also seem to participate in the generality hierarchy. They are normally less general than adjectives, and as can be seen from the ordering restrictions in the examples which follow ((39)-(40)) they are considered more general than relative clauses:

(39) a. umugasha uri hano wakoze n'umutxwaare
    man who-is here that-past-work is-chief
    'The man who is here who worked is the chief.'

   b. *umugasha wakoze uri hano n'umutxwaare

(40) a. umugasha uri muunzu umuhuungu yaahaaye i gitasha n'umutxwaare
    man who-is in-house boy that-past-give book is-chief
    'The man who is here to whom the boy gave the book is the chief.'

   b. *umugasha umuhuungu waahaaye i gitasha uri muunzu n'umutxwaare

Here again the restriction may be relaxed only under the proper contextual conditions.

(41) umugasha waže kundeba ežo uri hano n'umutxwaare
    man who-came to-me-see yesterday who-is here is-chief
    'The man who came to see me yesterday who is here is the chief.'

Sentence (41) would be acceptable only if many men came to see me yesterday, but only one is here now.

Adjectives, locatives, and relative clauses thus hierarchize in the following way:

(42) Adjective + Locative + Relative Clause

We would like to suggest that this is not just an unexplained syntactic condition, but is, rather, a reflection of the hierarchy of generality and may be restated as:

(43) permanent state + changeable state + transitory event
The validity of the formulation in (43) may be further demonstrated by the following data. A derived adjective may express a resulting state of an action/event. Adjectives of this type must follow 'inherent quality' adjectives, but must precede 'event-type' relative clauses in a definite description:

(44) a. iKuma Kinini Kivunitse Kiri kumeeza
    knife big that-broke is on-table
    'The big knife that broke is on the table.'

    b. *iKuma Kivunitse Kinini Kiri kumeeza

(45) a. iKuma Kivunitse Kaateemye Inyama Kiri kumeeza
    knife that-broke that-past-cut meat is on-table
    'The broken knife that cut the meat is on the table.'

    b. *iKuma Kaateemye Inyama Kivunitse Kiri kumeeza

The general-to-specific criterion is still crucial and the ordering hierarchy for (44)-(45) can be stated as:

(46) permanent state + state resulting from an event + transitory event

We would like to contend that the same hierarchy of generality is involved in all cases.

5. Conjoinability and Ordering of Relative Clauses

We have suggested that:

(a) Modifiers are hierarchized according to the generality of the information they provide about the element to be modified, and speakers proceed from the general to the specific in constructing a definite description.

(b) Modifiers are conjoinable only if they express information of roughly the same degree of generality.

As indicated above, restrictive relative clauses contain, primarily, specific, time-bound information. They utilize events or actions in which the individual to be described was a participant in one capacity or another. Thus they are situated at the bottom of the generality scale. Ideally, we would like to be able to differentiate among the various types of relative clauses along lines compatible with our hierarchy of generality. Thus far, however, our study has been
inconclusive in this regard. It may be that, all other things being equal (see sections 5.1 and 5.2), when modifiers express information which is nearly identical in generality there is, in actuality, free variation in ordering. Or it may be the case that the distinctions requiring particular orders are so fine as to elude judgements based on introspection and intuition. If this second alternative is indeed the case, examination of language in use, ideally via experimental methods, would be the only way to determine order preference. The data considered in this section, therefore, does not constitute an extension of the generalizations presented above. The ordering conditions to be discussed below are based, instead, upon considerations which are largely pragmatic in nature.

5.1 Temporal order. Speakers tend to order relative clauses along the time axis from past to future. Thus:

(47) a. umugabo wakoze uzaanaririimba ezo yaaQiie
    man who-past-work who-fut-and-sing tomorrow left
    'The man who worked (and) will sing tomorrow left.'

b. *umugabo uzaaririimba ezo waa(na)koze yaaQiie

(48) a. umugabo uriho ukora uzaanaririimba ezo yaaQiie
    man who-is who-works who-fut-and-sing tomorrow left
    'The man who is working and who will sing tomorrow left.'

b. *umugabo uzaaririimba ezo uriho u(na) kora yaaQiie

(49) a. umugabo wakoze uriho u(na)ririimba yaagiiye
    man who-past-work who-is who-(and)-sing left
    'The man who worked (and) who is singing left.'

b. *umugabo uriho ururiimba waa(na)koze yaaQiie

Because relative clauses are of roughly the same degree of generality, we would expect that they may be conjoined. This is, in fact, the case:

(50) a. umugore wa@ono ye waganariie n'umuririimbzi
    woman you-past-see you-past-talk is singer
    'The woman you saw whom you talked to is a singer.'

b. umugore wa@ono ye kaandi waganiriie n'umuririimbzi
    woman you-past-see and you-past-talk is-singer

As in English, the order of the clauses may not be reversed unless
the real-world normal order of events has been in some way distorted (e.g., if one talked to a woman by phone before seeing her). Under the usual conditions (50c) and (50d) would not be acceptable:

(50) c. *umugore waganiriże waβoonye n'umuririimbži
    d. *umugore waganiriže kaandi waβoonye n'umuririimbži

Apparently what is involved is a simple pragmatic consideration: you normally first see a person and then talk to them. The order of relative clauses reflects the real-world temporal sequence of events. Where the order reflects what is usually a real-world necessity, the clauses are obligatorily conjoined. 'Seeing' must take place before 'greeting':

(51) a. umugaβo naβoonye kaandi naramukiže n'umutxwaare
    man I-past-see and I-past greet is-chief
    'The man I saw and greeted is the chief.'
    b. *umugaβo naβoonye naramukiže n'umutxwaare
    c. *umugaβo naramukiže (kaandi) naβoonye n'umutxwaare

Sentence (51b) would be acceptable where, for instance, two people are seen but only one is greeted. That is, stacking is acceptable where temporal order is not the main consideration. 'Leave' and 'return' are similarly constrained in that leaving must occur before returning (again, unless there are possible real-world extenuating circumstances):

(52) a. umugaβo waβiije kaandi a-ka-garuka n'umutxwaare
    man who-past-leave and he-consec-return is-chief
    'The man who left and then returned is the chief.'
    b. *umugaβo waβiije waagarutse n'utxwaare
    man who-past-leave who-past-return is-chief
    c. *umugaβo wagarutse (kaandi) akageenda n'umutxwaare
    man who-past-return (and) who-consec-leave is-chief

Whether the sequential considerations are built into the presuppositions of the lexical verb, as in the case of 'return', or merely represent the pragmatic likelihood of situations, as in 'see'-'greet'/'talk to', is at this point irrelevant. Generally only where events are pragmatically independent of one another is there freedom in ordering:
(53) a. umuga\~o na\~oonye wakoze n'umutxwaare
   man I-past-see who-past-work is-chief
   'The man I saw who worked is the chief.'

   b. umuga\~o wakoze na\~oonye n'umutxwaare
      man who-past-work I-past-see is-chief
      'The man who worked whom I saw is the chief.'

If the events described in the two relative clauses are judged to have occurred simultaneously, the clauses are obligatorily conjoined:

(54) a. umuga\~o wakoze kaandi waririimb\~e yaagiiye
   man who-past-work and who-past-sing past-leave
   'The man who worked and sang (at the same time) left.'

   b. *umuga\~o wakoze waririimb\~e yaagiiye

Sentence (54b) is of course grammatical with the interpretation that the two actions did not occur simultaneously.

5.2 Topicality. Two relative clauses may not be conjoined (but rather must be 'stacked') if in the first the head noun is subject while in the second it is object:

(55) a. umuga\~o wariye inyama umugore ya\~oonye n'umutxwaare
      man who-past-eat meat woman who-past-see is-chief
      'The man who ate the meat whom the woman saw is the chief.'

   b. *umuga\~o wariye inyama kaandi umugore ya\~oonye n'umutxwaare

The passivization of the second clause, however, would yield a conjoinable result:

(56) umuga\~o wariye inyama (kaandi) wa\~oonye w'umugore n'umutxwaare
      man who-past-eat meat and who-past-see-paasive by-woman is-chief
      'The man who ate the meat and who was seen by the woman is the chief.'

This piece of data may be interpreted as a purely grammatical fact, i.e., that 'unlike' structures may not be conjoined. It may, however, be interpreted as follows. Object and subject obviously differ with respect to degree of topicality, with subject being the normal, unmarked sentential topic. Passivization is a way of raising, in a 'marked' way, an underlying object into topic position. The passivization of the second clause of (56) allows the head noun to function with the same degree of topicality, as subject, in both clauses. If 'degree of topicality' could be
shown to reflect 'degree of generality' (e.g., if 'more topical' = older presupposed information = more general), which seems plausible, this might be a further example of the generality hierarchy. ⁴

A similar condition, again describable in terms of the grammatical relations, is exhibited in (57)-(58). If an inanimate noun is modified by two restrictive relative clauses, where it is the grammatical subject of one and the non-subject instrument of the other, the clause in which it functions as the subject must come first:

(57) a. ikuma kaateemye inyama umugabo yakoresheze kirirabura
    knife that-past-cut meat man that-past-use is black
    'The knife that cut the meat that the man used is black.'

    b. *ikuma umugabo yaakor sheze kaateemye inyama kirirabura

(58) a. ikuma kaaguye haasi umugabo yakoresaga kirirabura
    knife that-past-fall to-ground man that-past-using is black
    'The knife that fell to the ground that the man was using is black.'

    b. *ikuma kaaguye haasi umugabo yakoresaga kirirubura

The domain of this ordering condition seems rather restricted, and it cannot be shown with other paired grammatical relations, e.g., subject/non-subject accusative, subject/non-subject dative, etc. The fact that a stative verb is involved in the subject clause of (58) suggests that agentiveness is not the controlling factor. Possibly the fact that 'use' is a verb which requires an instrument is significant. Obviously more work needs to be done in this area.

6. Discussion

We have shown that certain conditions on the ordering of restrictive modifiers in KinyaRwanda reflect a principle that we would like to call 'the generality hierarchy'. When more than a single modifier is necessary to assure definite description, the order established by the generality

⁴Hyman and Hawkinson [1974] have discussed topicality as a matter of degree rather than a discrete either/or feature. They have shown a hierarchy of topicality with the subject as unmarked topic, and then benefactive + dative + accusative objects. Consideration of topicality as generality follows suggestions made by Givón [personal communication].
hierarchy must be obeyed. With regard to adjectives, the generality hierarchy prescribes the following orders for different types of adjectives:

(59) \text{originally-inherent property} + \text{acquired or temporary property} \\
\text{observable characteristic} + \text{unobservable characteristic}

The ordering determined by the generality hierarchy for adjectives, locative phrases, and relative clauses is actually an extension of that given for adjectives alone:

(60) \text{permanent state} + \left\{ \text{changeable state} \right\} + \text{event}

Conditions governing the conjoinability of restrictive modifiers also reflects the generality hierarchy. If the hierarchy is considered a scale, then elements which occur in roughly the same part of the scale may not be conjoined. Elements which are at opposite ends of the scale may not be conjoined. Conjoined restrictive modifiers function much like stacked ones to narrow the domain of definite description. However, properties which do not differ sufficiently in 'generality' can neither hierarchize nor require strict ordering in conjunction.

It is possible that the 'topicality conditions' briefly discussed in section 5.2 might in the future be shown to reflect the generality hierarchy. Whether or not this is shown, we think that the Kinya-Rwanda data of sections 3 and 4 expand upon various observations made by Gruber [1967] about English. The observations about the two languages seem to point towards a possible language universal. It might be the case that the speakers of all languages construct definite descriptions in accordance with a 'rule of economy' that says "proceed toward specificity in modification only as far as is required to assure the establishment of a unique referent." It is possibly also the case that speakers of all languages order modifiers in such a way as to reflect their temporal sequence (as in section 5.1). This second possible generalization seems less interesting than the first, since it would seem to be conditioned totally by pragmatics. We readily concede
that much more research needs to be done to strengthen the suggestions made in this work, particularly since we would like to investigate a possible universal 'rule of economy'. We think that examination of data from other languages and also experimental study of linguistic behavior should prove suitable extensions of this study.

REFERENCES


ZULU PRONOUNS AND THE STRUCTURE OF DISCOURSE

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1. Introduction

Zulu, a Southern Bantu language of the Nguni group spoken mainly in Zululand, has a variety of pronominal forms that can be used in place of or together with a coreferent noun. The coexistence of a noun and its coreferent pronoun(s) in a sentence is not a syntactically redundant phenomenon in Zulu. Rather, the choice of a particular pattern of coexistence is determined by the discourse context, i.e., what the speaker assumes that the hearer knows. The constructions that will be used to illustrate noun-pronoun(s) coexistence involve subjects, direct and indirect objects and reflexives.

2. Subject Pronouns

Consider the following sentences:

(1) umfana u-funa ukudla.
    boy he-want food
    'The boy wants food.'

(2) u-funa ukudla.
    he-want food
    'He wants food.'

1 I am indebted to Talmy Givón for comments on an earlier draft of this manuscript.

2 These can be morphologically classified into bound (dependent) and unbound (independent) morphemes. The exhaustive list of the proforms is found in the appendix.

   The bound morphemes (anaphoric pronouns) are attached to the verb while the unbound ones are not. I will use Pro for unbound pronouns; SVA for subject-verb-agreement pronouns and OVA for object-verb-agreement.

3 Various researchers have suggested that the bound prefixes arise from pronouns (cf. Givón [1975a], Keenan [1975], Moravcsik [1970]). SVA's are obligatory/automatic, while OVA's are optional.
In sentence (1) the subject 'boy' is overtly expressed. Therefore, this sentence can be used in a situation where the hearer cannot predict what the subject will be. This may be characterized by the relatively neutral question such as:

(6) a. What's happening?
   b. What's the matter?

When the subject of the sentence has been introduced in previous discourse, on second occurrence it may be deleted and the SVA will function as an anaphoric pronoun, as in sentence (2) above. Sentence (2) may be elicited by questions such as:

(7) a. What's the matter with the boy?
   b. What does the boy want?\(^4\)

In these questions the subject is known to both speaker and hearer.

The subject noun can also be followed by an unbound pronoun in addition to SVA, as in sentence (3) above. Sentence (3) has a contrastive reading to the previous statement. For example:

\(^4\)In most cases a question such as (7a) can be answered by the NP object alone, but the verb may also be repeated. On the other hand, (7b) always requires a verb and an object NP in response.
(8) Abafana ba-funa ubisi, uSipho yena u-funa ukudla.
    boys they want milk, Sipho he he-want food
    'The boys want milk, but Sipho (himself) wants food.'

This pattern is thus used to contrast the subject with other members of a group to which it belongs. The unbound pronoun signals this contrastive device. To illustrate this, consider:

(9) Abafana ba-funa ubisi, uSipho u-funa ukudla.
    boys they-want milk, Sipho he-want food
    'The boys want milk, and Sipho wants food.'

In sentence (9) the unbound pronoun is left out. The sentence is interpreted as non-contrastive and Sipho is not seen as a member of the group of boys. The English translation will use in (9) and instead of but. This may be further shown by the overt use of the conjunctions 'and' and 'but':

(10) Abafana ba-funa ubisi,  
    boys they-want milk,  
    \{ \text{no } \} \text{ Sipho u-funa ubisi,}  
    \{ \text{and } \} \text{ Sipho he-want milk}  
    \{ \text{*kodwa u } \}  
    \{ \text{*but } \}  
    'The boys want milk, and Sipho wants milk too.'  
    \{ \text{*but } \}

Sentence (9) when used with kodwa 'but' becomes ungrammatical both in English and Zulu because it is non-contrastive as seen in (10). If on the other hand we use kodwa and na with sentence (8), then the sentence with na will be ungrammatical:

---

In this sentence the first part of the sentence represents the discourse context, while the second part brings contrast. It is the second part that we are interested in.

The English sentence in (10) using 'but' is acceptable, provided its context establishes an appropriate contrast, as in e.g., "There's not enough milk to go around, so someone will have to go without it. Now, all the boys want milk--but Sipho wants milk too--so what shall we do?"
(11) Abafana ba-funa ubisi, {kodwa} uSipho yena ufuna ukudla.
    boys they-want milk, {but } Sipho he he-want food
    *no
    *and

    'The boys want milk, {but } Sipho (himself) wants food."

Sentences (8) and (11) are thus contrastive while sentences (9) and (10)
are non-contrastive, and merely conjoined.

In cases where the speaker can assume that the subject of the con­
trastive sentence is known to the hearer, that subject may be deleted as
in (4) above. Sentences like (4) will be used shortly after the intro­
duction of the subject, and they will always be understood as being con­
trastive to an earlier statement in the discourse. Again the unbound
pronoun serves as a contrastive marker. While the SVA by itself, as in
(2), gives merely an anaphoric reading, not a contrastive one.

In certain non-emphatic cases the subject noun can follow its corefer­
ent unbound pronoun, as in sentence (5) above, and then the reading ob­
tained is contrastive. This construction will be used in cases where
more boys other than Sipho were mentioned earlier in the discourse. The
speaker repeats the noun parenthetically after its coreferential pronoun
as an afterthought, in order to avoid confusion on the part of the hear­
er.²

3. Object Pronouns

Object nouns may coexist with coreferent pronouns in the same sen­
tence. Thus, consider the following patterns:

(12) U-shaya imbongolo.
    he-hit donkey
    'He hits a donkey.'

(13) U-shaya yona.
    he-hit it. (it=donkey)
    'He hits it.' (contrastive with respect to object)

²For a discussion of afterthought-topic, see Givón [1975a].
(14) U-ya-yi-shaya.
  he-ASP-it-hit
  'He hits it.'

(15) U-shaya  
  he-hit it nonkey
  'He hits it, the donkey.' (contrastive with respect to the object)

(16) U-ya-yi-shava imbongolo.
  he-ASP-it-hit donkey
  '____ but he hits it, the donkey.'

(17) U-va-~i-shaya yona.
  he-ASP-it-hit it (it=donkey)
  '____ but he hits it. (contrastive with respect to the object)

(18) U-va-~i-shaya yona imbongolo.
  he-ASP-it-hit it donkey
  '____ but he hit it, the donkey.' (contrastive with respect to the object)

In sentence (12) the object is introduced to the hearer for the first time. This sentence can be elicited by the more neutral question:

(19) What is the farmer ing?

The object noun can be replaced by an unbound pronoun after appearing first in the discourse, as in (13). The reading obtained from (13) is that of contrast or identifying a single item that has been mentioned earlier in the discourse against the rest of the items belonging to a class. For example, a farmer may have a pack of donkeys, one of which has been mentioned earlier in the discourse. Later, the speaker and the hearer learn that the farmer is hitting a donkey. The following question might be used by one of them:

(20) Which donkey is the farmer hitting?

The response to this question might be sentence (13), if the donkey referred to by the pronoun has been mentioned before. If the donkey was

8The morpheme /-va-/ will be discussed later. Zulu grammarians call it a long form of the indicative mood. (cf. Doke [1947]).
not mentioned earlier in the discourse the response might take a mere descriptive form, i.e., "he is hitting the brown donkey", etc.

Object nouns, like subject nouns, need not be repeated, once mentioned earlier in the discourse. In this case the object noun can also be represented by an OVA as in (14). The reading obtained in (14) is that of focus on the activity or action (verb), whereas in (13) the focus is on the object. Sentence (14) is thus non-contrastive with respect to the object noun, and can be a response to the question:

(21) a. What is the farmer doing to the donkey?

or to the negative assertion:

b. The farmer doesn't hit the donkey.

Sentence (13) cannot be elicited either by (21a) or (21b), and sentence (14) cannot be elicited by the question (20). The speaker thus has different assumptions about what the hearer knows when using (13) and (14).

The verb plus unbound pronoun sequence may also be followed by the coreferent noun itself, as in (15). The reading obtained is contrastive and similar to that of (13), with the exception that the noun is added as an afterthought, to avoid ambiguity as to the reference of the pronoun.9 This is used when more than one noun from the same class have been mentioned earlier in the discourse. Sentence (15) can be elicited by question (20).

The OVA may also be followed by its coreferent noun, as in (16). The reading obtained involves an afterthought, plus "contrary to negation of the verb."10 Take the example of the farmer above. Suppose the farmer in general doesn't hit animals, but does hit certain ones such as donkeys, and this fact is known by the speaker. If on the other hand most people—including the hearer—assume that the farmer does not hit any animals, i.e., including donkeys, then the speaker will

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9 See Givón [1975a].
10 This expression, as well as the expression "contrary to expectations", was suggested by Givón [personal communication].
use sentence (16) to contradict the idea held by the hearer, i.e., that the donkey being an animal is not being hit by the farmer. This contrasts the donkey—which is an animal but which nevertheless is being hit by the farmer—from the rest of the animals that the farmer doesn't hit. Sentence (16) can be elicited as a response to the statement:

(22) The farmer does not hit animals.

Again the assumptions held by the speaker about the hearer differ in (15) and (16). Sentence (15) cannot be elicited by (22), nor can (16) be elicited by (20).

The OVA can also be followed by the independent pronoun as in (17). Both OVA and the Pro are understood as referring to the same object noun. Sentence (17) is used contrastively, to express "contrary to expectations" couched in a previous statement. Take again the example of the farmer, who in general doesn't hit donkeys. If the speaker knows that the farmer does hit one donkey that has been mentioned earlier in the discourse, then she will use (17). The unbound pronoun yona singles out the one individual donkey from other donkeys that are not hit by the farmer. Sentence (17) may appear in the context of the statement:

(23) The farmer doesn't hit donkeys (in general).

Sentence (18), like (17), is contrastive, expressing "contrary to expectations", except that the noun is expressed overtly as an afterthought to avoid ambiguity of reference. The reading obtained is similar to that of (17).

For both subject and objects the unbound pronoun is used in contrastive situations, when the coreferent noun is known to the hearer. The SVA by itself is used non-contrastively. The OVA by itself is also used non-contrastively, at least so far as the object is concerned. Though it may be, naturally, used when the verb is in contrast/focus, as in (14) and (21b) above.
4. A Note on the Verb-Focus Morpheme /-ya/-

This morpheme appears in the present tense when there is no complement following the verb. That is, when the new information contained in the predicate phrase excludes the complement. For example, it may be used when no object is mentioned, as in:

(24) U-ya-shaya.
    he-ASP-hit
    'He hits (something).'

Sentence (24) may be elicited by a question such as:

(25) What is he doing?

Without the verb-focus morpheme this sentence is ungrammatical:

(26) *U-shaya.
    he-hit

Further, this morpheme must be obligatorily used when the object is definite or an anaphoric pronoun, i.e., when it is known to the hearer, as in (14), (16), (17), (18) above. This can be seen from the ungrammaticality of (27a,b) below when contrasted with the grammatical (14) and (16), respectively:

11For a more extensive discussion of the verb-focus aspect in some Bantu languages, see Givón [1975b].

12Sentences in (27) are acceptable/grammatical in the following discourse context:

Sipho: Wena Thoko ungayishaya imbongo.  
You Thoko can hit the donkey.'

Thoko: ngi-yi-thanda?
    I-it-like
    '____ while liking it?'

Sipho: u-yi-thanda
    you-it-like
    '____ while liking it.'

Sipho knows that Thoko loves donkeys but that under certain circumstances or pressure he suspects that Thoko can overrule this characteristic and hit donkeys.

The use of /-ya/- needs further investigation because it seems that there are at least two /-ya/-s, one marking the present tense (progressive) and the other might have to do with focus on the action.
The reflexive marker /-zi-/ occupies the OVA slot, and likewise requires the obligatory presence of the /-zi-/ morpheme in intransitive constructions, but differs from the OVA in that it may or may not need the /-zi-/ in transitive constructions, or if an adjunct follows, as in (d) and (e) below:

    boy he-ASP-REFL-hit
    'The boy hits himself.'

b. Umfana yena u-ya-zi-shaya.
    boy he he-ASP-REFL-hit
    'but the boy hits himself.'

c. Vena u-ya-zi-shaya.
    he he-ASP-REFL-hit
    'but he hits himself.'

d. U-ya-zi-shaya yena (umfana).
    he-ASP-REFL-hit him boy
    'but he hits himself, (the boy)

e. U-zi-shaya yena (umfana)
    he-REFL-hit him boy
    'he hits himself, (the boy).'

    he-ASP-REFL-hit
    'He hits himself.'

In (28a) the subject is introduced and in (b) and (c) the subject is being contrasted with what went on previously. In (d) the reading obtained is also contrastive with focus on the action. Sentence (e) may be used to contradict a statement like: 'X is hit by Y'; or it may be
an answer to a question: "Who hits him?". In both (d) and (e) the subject NP must have been mentioned earlier in the discourse since it is expressed by a pronoun. Both sentences express contrast, but in (d) the contrast focuses on the action, while in (e) it focuses on the identity of the object, i.e., its being the child himself rather than someone else. Sentence (28f) has a reading similar to that of (28a), except that the subject has been mentioned in the preceding discourse and is therefore re-introduced as a pronoun.

6. Direct and Indirect Object

In verbs that take two objects, the facts observed above, i.e., i. that the unbound pronoun expresses both contrast (i.e., 'focus') and coreference (i.e., 'topic'), and ii. that the OVA may appear in contexts where the sentence serves to contradict a corresponding negative, seem to hold for both objects. Thus, consider the following sentences:

(29) a. umfana u-nika indoda isinkwa
   boy he-give man bread
   'The boy gives bread to the man.'

b. umfana u-si-hika indoda isinkwa
   boy he-it-give man bread
   'The boy gives the bread to the man.'

c. umfana u-nika yona isinkwa
   boy he-give him bread
   'The boy gives bread to him.'

Sentence (29a) may be an introductory sentence in this discourse, or an answer to a question such as: "What does the boy do?". Sentence (29b) may be used to contradict a statement such as: "The boy is not giving bread to the man", or alternatively as an answer to the question: "What does the boy do with the bread?". Sentence (29c) may be used in the context of contrasting the indirect object 'him' with others to whom no bread was given, or about whom it was erroneously claimed that the boy gave them bread. The fact that in (29b) the OVA appears but the verb-focus morpheme /-ya-/ does not, is readily explained from observing
that while the noun 'bread' is not new information here, the noun 'man' is, so that the condition for using /-ya-/—that only the verb is new information—does not apply. 13

7. Summary

I have shown that Zulu may use more than one coreferential pronoun in the same construction, sometimes two pronouns together with their coreferent noun. The distribution of all possible combinations is used to map various discourse contexts, i.e., various types of assumptions which the speaker may make about what the hearer knows.

The facts of Zulu pronominalization seem to rule out certain proposals made in the past concerning the formal way of handling the grammar of pronominalization. For example, Givón [1970] suggested that within one sentence only two coreferential elements may coexist: "... the force of the magical number two as upper bounds on the number of coreferential nominal elements in a (non-topicalized) construction seems compelling to me ...". Givón further suggested that the "magical number two" principle militated for a transformational model of pronominalization, via copying-plus deletion, and against both the interpretative approach [Jackendoff 1969] and an alternative transformational approach of movement-plus-deletion. The facts of Zulu cast strong doubt on the validity of any strict transformational approach to pronominalization, since two pronouns may coexist with their coreferent noun, and further the various combinations of pronouns with the noun are used for distinct communicative purposes, to map different discourse situations. Pronominalization is just showing itself to be not a trivial syntactic process in Zulu, but rather a complex array of pragmatic devices used to elucidate subtle distinctions concerning the discourse context in which sentences are uttered.

13 See Givón [1975b].
REFERENCES


### APPENDIX I

Pronominal forms for the various noun classes in Zulu

<table>
<thead>
<tr>
<th>Class</th>
<th>SVA</th>
<th>OVA</th>
<th>DEPENDENT</th>
<th>INDEPENDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st person sg.</td>
<td>ngi- -ngi-</td>
<td>mi - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl.</td>
<td>si- -si-</td>
<td>thi- na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd person sg.</td>
<td>u- -ku-</td>
<td>we - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl.</td>
<td>ni- -ni-</td>
<td>ni - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1/2 sg.</td>
<td>u- -m-</td>
<td>ye - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl.</td>
<td>ba- -ba-</td>
<td>bo - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 3/4 sg.</td>
<td>u- -wu-</td>
<td>wo - na</td>
<td></td>
<td></td>
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<tr>
<td>pl.</td>
<td>i- -yi-</td>
<td>yo - na</td>
<td></td>
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</tr>
<tr>
<td>Class 5/6 sg.</td>
<td>li- -li-</td>
<td>lo - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl.</td>
<td>a- -wa-</td>
<td>wo - na</td>
<td></td>
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</tr>
<tr>
<td>Class 7/8 sg.</td>
<td>si- -si-</td>
<td>so - na</td>
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<td></td>
</tr>
<tr>
<td>pl.</td>
<td>zi- -zi-</td>
<td>zo - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 9/10 sg.</td>
<td>i- -yi-</td>
<td>yo - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl.</td>
<td>zi- -zi-</td>
<td>zo - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 11 sg.</td>
<td>lu- -lu-</td>
<td>lo - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl.</td>
<td>zi- -zi-</td>
<td>zo - na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 14</td>
<td>bu- -bu-</td>
<td>bo - na</td>
<td></td>
<td></td>
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FOCUS AND THE SCOPE OF ASSERTION: SOME BANTU EVIDENCE

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1. Introduction

It is normally assumed, for the "neutral" sentence pattern of a language, that the predicate phrase ("verb phrase") contains the new information or asserted portion, while the subject is the topic or presupposed portion with respect to which the assertion is being made. Even conceding this rather gross generalization to be true in some intuitive sense, there remains the problem of the scope of assertion when the verb phrase contains a complement or object in addition to the main verb itself. For a number of complement types, a verb phrase containing a complement is potentially ambiguous as to whether the entire verb phrase is asserted, i.e., in focus, or whether only the complement which follows the verb is in focus. For example, consider (1) below, which may be given as a felicitous answer to either the wider (VP scope) question (2), or to the narrower (COMP scope) question (3):

(1) He went into the bar.
(2) What did he do then? (VP scope)
(3) Where did he go then? (COMP scope)

The use of contrastive stress may remove this potential ambiguity of (1), but the discourse context for contrastive stress involves additional, stronger, more complex assumptions.  

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1 An earlier version of this paper was read at the 6th Conference on African Linguistics, Ohio State University, April 1975.

2 The traditional assumption as to which clause-type is the "neutral" one in language has always singled out the main-active-declarative-affirmative clause. For discussion and justification, see Givón [1975d].

3 See discussion in Givón [1975c].
The negation of sentences such as (1) retains the potential ambiguity of scope. Thus, it may be used to deny the wider (VP scope) assertion, as in (4) below, or the narrower (COMP scope) assertion, as in (5):

(4) a. Where's Joe?
   b. I think he went into the bar.
   c. No, he didn't go into the bar, he's sitting right there.
      (VP scope)

(5) a. Where did Joe go?
   b. I think he went into the bar.
   c. No, he didn't go into the bar, he went into the lobby.
      (COMP scope)

Again, contrastive stress on the complement tends to disambiguate the narrower scope negation, while stress on didn't will tend to suggest the wider (VP) scope.

Other types of complements tend to behave differently, and one could ultimately show that these differences stem from the pragmatics of what one considers to be normative action. Thus, with great many manner–adverb complements, the scope of the assertion is ambiguous in the affirmative, but unambiguously narrower in the negative. For example, (6a) below may be a felicitous answer to either the wider (VP scope) question (6b) or the narrower (COMP scope) question (6c):

(6) a. He ran as fast as he could.
   b. What did he do then?    (VP scope)
   c. How did he run then?    (COMP scope)

On the other hand, the negative corresponding to (6a) tends to have only the narrower (COMP) scope:

(7) He didn't run as fast as he could.

The difference between (6a) and (7) may be also characterized in terms of their implicational properties. Thus the narrower scope interpretation of (6a) implies the wider (VP) scope, but the narrow negation scope of (7) does not imply the wider (VP) scope of negation:
(8) He ran as fast as he could $\supset$ He ran
(9) He didn't run as fast as he could $\supset$ He didn't run

Further, not only does the implication in (9) fail, which is still consistent with the logic of (8), but in fact the stronger inference (10) seems to hold in this case, which is—from a strict logical point of view—a contradiction of (8).

(10) He didn't run as fast as he could.

He ran, though not as fast as he could.

This apparent logical contradiction may be summarized as:

(11) a. $p \supset q$
b. $\neg(\neg p \supset \neg q)$
c. $\neg p \supset q$

where (11b) is a correct inference from the premise (11a), but (11c) is not.

The pragmatic reason why this state of affairs is tolerated in language is fairly transparent. Negative assertions are used in human language in contexts where the corresponding affirmative has been mentioned, deemed likely, or where the speaker assumes that the hearer—erroneously—holds to a belief in the truth of that affirmative. Why then the seemingly contradictory (11c)? Consider: If one wanted to assert that no action has taken place, i.e., 'John didn't run at all', then the sentence (7) is wasteful, since (12) below will suffice:

(12) John didn't run.

Thus, if the negative in (7) is to have any independent communicative value to differentiate itself from (12), it must then exclude the verb from the scope of negation, and thus negate only the complement.\(^5\)

\(^4\)See discussion in Givón [1975a], Garcia [1975].

\(^5\)For this suggestion I am indebted to Bob Kirsner [personal communication].
Other complement types seem to impose the narrower (COMP) focus already in the affirmative. For example, consider:

(13) a. John ate the glass on purpose.
    b. John ate his dinner on purpose.

Sentence (13a) is felicitous, but of the two questions in (14) below, it could be normally used as a felicitous answer only to the narrow (COMP) scope question (14c), but not to the wider (VP or OBJ) focus questions (14a,b):

(14) a. What did John do then? (VP focus)
    b. What did John eat then? (OBJ focus)
    c. How come he ate the glass? (PURPOSE focus)

In order to understand why this is so, consider the oddity of (13b). This sentence is highly redundant because: (i) eating one's dinner is a normal action one performs; (ii) actions normally performed by agents are performed on purpose. Thus (13b) is odd because it has no informative value, given that eating one's dinner is the normal case, and given convention (ii) above. On the other hand, (13a) has definite informative value, since the action of "eating glass" is counter-normative, and therefore the question arises whether a person did it on purpose or by accident. Finally, why is the assertion scope automatically narrowed to the purpose complement in (13a)? The answer to that again hinges on the pragmatics of normative vs. counter-normative action. Eating glass is a counter-normative action, which by itself makes it an information-bearing event, a fact which may be seen from the informative oddity of (15c) below as an answer to (15a), as contrasted with the informative felicitousness of (15b):

(15) a. What's new with John?
    b. He ate glass yesterday.
(15) c. He ate his dinner yesterday.\footnote{This sentence becomes "informatively felicitous" when the speaker and hearer share the knowledge that John normally (or for a time) was not eating his dinner, i.e., when the norm/counter-norm relations are reversed. Similarly (15b) will become redundant if John normally eats glass.}

Thus, if one says that someone ate glass on purpose, a pragmatic inference attached to this is that it is not the "eating glass" per se that is in assertive focus, but rather the fact that it was done on purpose.

One could go on illustrating how with different complement types, different verbs and different objects the pragmatics of normative action control, to quite an extent, the scope of assertion-focus of verb phrases in English. However, this is only a background to the phenomena discussed in this paper. In a number of Bantu languages, the scope contrasts discussed above receive overt morphological expression. An affix, most commonly associated with the tense-aspect-modality prefixes on the verb, marks the scope of the assertion as to whether the verb is included (VP scope) or excluded (COMP scope) from the new information. This paper deals with the rule-governed behavior of these focus morphemes, which so far have been identified in three languages, Bemba, Rwanda-Rundi and Zulu. Of these three, the contrast has the widest distribution in Bemba, and is best introduced perhaps by citing some data from this language.

2. The Focus Aspect in Bemba

There are seven minimal pairs for this distinction in the Bemba tense-aspect system, six of those in various past tense categories and one in the habitual. I will first illustrate the distinction in the terminated, distant (before yesterday) past. In this time division, the morphological contrast is between the VP-scope morpheme -\textit{â}l\textit{f}- and the COMP-scope morpheme -\textit{â}-.

When the verb phrase contains only a verb, only the VP-scope particle may be used:
(16) a. ba-ālī-boombele 'They worked'
    b. *ba-ə-boombele

When a complement, nominal or adverbial, is present, one obtains the distinction of scope:

(17) a. ba-ālī-boombele saana 'They worked hard' (VP scope)
    b. ba-ə-boombele saana 'They worked hard' (COMP scope)
    c. ba-ālī-boombele mumushi 'They worked in the village' (VP scope)
    d. ba-ə-boombele mumushi 'They worked in the village' (COMP scope)
    e. ba-ālī-boombele neefumu 'They worked with the chief' (VP scope)
    f. ba-ə-boombele neemfumu 'They worked with the chief' (COMP scope)
    g. ba-ālī-IiIe umukate 'They ate bread' (VP scope)
    h. ba-ə-IiIe umukate 'They ate bread' (COMP scope)

The sentences with the VP scope (17a,c,e,g) may be all used to answer the wider scope WH question 'What did they do then?'. The sentences with the COMP scope (17b,d,f,h) are used in contexts where the verb itself is not new information, i.e., to answer the more specific WH questions such as, respectively, 'How did they work?', 'Where did they work?', 'With whom did they work?' and 'What did they eat?'. Cleft-focusing on the complement, which leaves the verb itself as part of the presupposition, obligatorily requires the COMP-focus on the verb:

(18) a. mūukate ba-ə-IiIe 'It's bread that they ate' (COMP focus)
    b. *muukate ba-ālī-IiIe (*VP focus)

Under the scope of negation, as one would predict from the preceding discussion, only the COMP-focus particle may be used, thus mapping in an overt morphological way the very same situation observed above for some English complement types. That is:

7The underlining indicates the scope of the assertion, i.e., new information.
(19) a. ta-ba å-boombele saana 'They didn't work hard.' (COMP focus)
    b. *ta-ba-ålf-boombele saana (*VP focus)

Things are a bit more complicated, however. When the verb phrase contains only a verb, and thus the focus of negated assertion is unambiguously upon that verb, the same restriction on the VP focus particle is observed:

(20) a. ta-ba-d-boombele 'They didn't work.' (COMP focus)
    b. *ta-ba-dlf-boombele (*VP focus)

Does this represent an "analogical extension" or "grammaticalization" of the system, indicating the breakdown of the inherently semantic underlying regularity? It seems to me that one may interpret these data within the context of that underlying regularity. As I have shown elsewhere, negative sentences are used in the context where the corresponding affirmative has been mentioned before or, alternatively, when the speaker assumes that the hearer tends to believe in the truth of the corresponding affirmative. While this is not, per se, a totally presuppositional context, it nevertheless involves a context where the verb, at the very least, could not be new information to the hearer. One may thus view the mapping system of Bemba as follows:

(21) Verb not new information = COMP focus
    Verb new information = VP focus

Under this kind of formulation, the restriction expressed in (20) above becomes compatible with the underlying semantic restriction discussed above.

This alternative formulation also permits us to understand another set of restrictions on the VP-focus particle. In this case VP-scope particles are excluded from relative clauses, cleft and pseudo-cleft constructions, WH-questions, as well as other relative-related and

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8 Givón [1975a], but see also Garcia [1975].
mostly presuppositional\(^9\) adverbial clauses such as "if", "when", "because", "in spite of", etc. Given the formulation in (21) above, it is rather transparent why the VP-scope particle should be barred from presuppositional clauses, since the verb there could not be new information. And the restrictive relative clause is presuppositional, and --whether semantically or syntactically--it underlies all the other constructions mentioned above. I will therefore illustrate the restriction only in this underlying environment:\(^10\)

(22) a. umuana a-àlf-boombele 'The child worked.' (VP focus)
    b. umuana u-à-boombele 'The child who worked.' (COMP focus)
    c. *umuana u-àlf-boombele (*VP focus)
    d. umuana a-àlf-boombele saana 'The child worked hard.' (VP focus)
    e. umuana u-à-boombele saana 'The child who worked hard.' (COMP focus)
    f. *umuana u-àlf-boombele saana (*VP focus)

There is a curious way in which the scope-narrowing observed above in negation finds a parallel in relativization. Notice that while (23a) below implies (23b), the individual designated by the relative clause corresponding to (23a) is not the same as that designated by the relative clause corresponding to (23b):

(23) a. The man came yesterday. ⊃ b. The man came.
(24) The man who came yesterday. ≠ The man who came.

On the face of it the claim in (24) above seems patently false, since obviously if it is true of a man that "he came yesterday", it is

\(^9\)Of these, "if" clauses are obviously not presuppositional. However, much like negatives and yes-no questions, they may largely involve environments in which the probability of truth of a certain proposition has been discussed or entertained. To that extent, then, the verb of that proposition is not altogether new information.

\(^10\)The same restriction operating in a cleft-focus construction is illustrated in (18) above.
equally true of him that "he came". It seems to me, however, that the strategy of constructing unique descriptions via the use of restrictive relative clauses militates toward the inherent correctness of (24). When the verb "came" by itself is sufficient to differentiate "the man who came" from all those who didn't come, a time adverbial or other complements are not going to be used, since they are superfluous and in fact misleading in that they suggest that "other men came but at times other than yesterday". Thus, only under conditions where the verb by itself does not suffice to differentiate a unique individual, will further information be used in the relative clause. In other words, in a relative clause which contains complement phrases, those complements—to the exclusion of the verb, occupy the focal position in performing the restrictive-designative function of the relative clause. Thus, for communicative reasons quite analogous to those suggested above for negatives, relative clauses represent a similar "narrowing of focus" when a complement phrase is present.

3. Focus and Topic in Rwanda

Within the Rwanda tense-aspect system there are four minimal pairs of the VP-focus vs. COMP-focus contrast, out of which I will illustrate the behavior of this phenomenon with the past-tense particles -à- (COMP focus) and -àrà- (VP focus). While this sub-system in Rwanda shares many of the features seen above in its Bemba equivalent, such as the restriction on VP-focus particles in negative and relative environments, it also exhibits a number of differences. When no complement is present, only the VP focus particle may be used, as in:

(25) a. Yohani y-àrà-koze 'John worked.' (VP focus)
    b. *Yohani y-à-koze (*COMP focus)

On the other hand, it is hard to get the contrast, as one gets it in Bemba, when complements are present. Only with some manner adverbials can one get acceptable use of the VP-focus particle, otherwise the use

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11For Rwanda data I am much indebted to Alexandre Kimenyi [personal communication], but see also Kimenyi [1973, 1975] and Sanchez-Mejfa [1974].
of the COMP-focus aspect is obligatory. Thus compare:

(26) a. Yohanl y-à-koze cyaane
    'John worked hard.' (COMP focus)
  b. Yohanl y-àrá-koze cyaane
    'John worked hard.' (VP focus)
  c. Yohanl y-à-koze vuuba
    'John worked fast.' (COMP focus)
  d. *Yohanl y-àrá-koze vuuba
    (*VP focus)

It is not obvious in what "structural" way the adverbs "hard" and "fast" differ from each other, but there very well may be some pragmatic strategy involved here that is at the moment not obvious to me. When locative adverbs are present, again only the COMP-focus aspect may be used:

(27) a. Yohanl y-à-koze mumusozi
    'John worked in the village.'
    (COMP focus)
  b. *Yohanl y-àrá-koze mumusozi
    (*VP focus)

The same is also true with participial adverbs, as in:

(28) a. Yohanl y-à-koze a-rlílimba
    'John worked singing.'
    (COMP focus)
  b. *Yohanl y-àrá-koze a-rlílimba
    (*VP focus)

However, when the participial adverb pertains to the object rather than the subject, at least in some instances the contrast may be obtained, as in (29) below where the object is pronominalized:

(29) a. Yohanl y-à-u-rílye u-shyuushye
    'John ate it hot.'
    (COMP focus)
  b. Yohanl y-àrá-u-rílye u-shyuushye
    'John ate it hot.'
    (VP focus)

In cases such as (26a,b) and (29) where the contrast is made, it patterns after what was suggested earlier for Bemba. That is, (26a) is a proper answer to the COMP-scope WH question "How did John work?", while (26b) is a proper answer to the VP-focus WH question "What did John do then?" Similarly (29a) is a proper answer to "How did John eat it?", while (29b) is a proper answer to "What did John do with it?" With these two cases aside, it seems that Rwanda shows a strong preference for a discourse strategy that is different from that of Bemba, a strategy which may be summarized as:
"If the verb phrase contains a complement, then only that complement is the new information advanced in this particular speech transaction, while the verb itself is not."

That this strategy is not applied across the board and excludes certain types of complements is probably significant, and the specificities of these exclusions remain to be assessed. Let me now turn to the interaction of this contrast with the phenomena of definiteness, pronominalization and topicalization in Rwanda.

When an indefinite accusative object—mass or count—is present in the VP, the general rule is followed by which only the COMP-focus particle may be used, as in:

(31) a. Yohani y-₃-riiye iffι 'John ate fish/a fish.' (COMP focus)
   b. *Yohani y-₃rα-riiye iffι. (*VP focus)

When the object is definite, however, i.e., when it is not new information, the VP focus is obligatory and the COMP focus is unacceptable:

(32) a. Yohani y-₃rα-yi-riiye iffι 'John ate the fish.' (VP focus)
   b. *Yohani y-₃-yi-riiye iffι (*COMP focus)

Since definitization of objects is achieved most commonly via pronominalization, as in (32), it is not altogether surprising to find the same constraint operating when objects are anaphorically pronominalized, as in:

(33) a. Yohani y-₃rα-yi-riiye 'John ate it.' (VP focus)
   b. *Yohani y-₃-yi-riiye (*COMP focus)

This constraint, as a pragmatic strategy, is quite compatible with what has been seen so far concerning this focus contrast. Since the object is old information, obviously the new information—i.e., the focus—

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12 Most likely some pragmatic strategies, involving the probability of what is likely to be considered as "unitary piece of message", as against what is more likely to be broken into smaller natural message units, are at the bottom of this distribution.
must be the verb itself, given that the subject is normally definite and presupposed.\(^\text{13}\)

Left-topicalization is a common discourse devise in Rwanda, used roughly in the same contexts as in English, i.e., to recall a topic that has been mentioned in previous discourse across a certain temporal gap during which other topics occupied the center of the stage. It is a construction limited to definite or generic NP's, a rather universal constraint.\(^\text{14}\) Not surprising, when an object NP is topic-shifted, the same constraint on the focus situation prevails as when it is definitized or pronominalized:

(34) a. _iffi, Yohan y-àrá-yi-riiye  'The fish, John ate it.' (VP focus)

b.  *_iffi, Yohan y-à-yi-riiye  (*COMP focus)

The left-topicalization device thus tags the object as old information, and thus automatically leaves the verb alone as candidate for focus or new information—hence the obligatory VP focus.

A different topic-related situation involves adverbial clauses and their relation to the main clause. In general, one could show that the position of an adverbial clause—before or after the main clause—is a topic-related phenomenon. Let me exemplify this by the use of appropriate WH questions, which function to establish the topic-focus (or old/new information) context for the message:

(35) Context: a. What did you do yesterday?

Message: b. Yesterday I worked.

c. *I worked yesterday.

d. I worked yesterday.

Context: e. When did you work?

Message: f. I worked yesterday.

g. *Yesterday I worked.

h. Yesterday I worked.

\(^{13}\)For a discussion of subject properties as related to topic, see Keenan [1975] and Givón [1975b].

\(^{14}\)For some details of this strategy, see Givón [1975b, 1975c].
Thus, in an SVO language such as English or Rwanda, the sentence final position is reserved most commonly for the constituent in focus, the one carrying the focus (or "new information") stress of the sentence. A reversal of this order is of course possible, as in (35d) and (35h) above, but only if the focus stress is also shifted. With all this in mind, it is not altogether surprising to see that the focus particles of Rwanda are sensitive to the topic-focus position of the main clause viz-a-viz the adverbial clause. Thus consider:

(36) a. Yohani a-ngo-kora mu-gitoondo 'John works in the morning.' (COMP focus)
   b. *Yohani a-ra-kora mu-gitoondo (*VP focus)
   c. mu-gitoondo Yohani a-ra-kora 'In the morning John works.' (VP focus)
   d. *mu-gitoondo Yohani a-ngo-kora (*COMP focus)

Syntactic position per se is not the only device for establishing topicality relations. Both English and Rwanda have another device, labeled "afterthought topic" in which the topic constituent is right-dislocated. This device is to some extent similar in function to the recall-topic ("left-dislocation") construction described above, but is in some way a hedge or blend. It is used when the speaker first decides to use mere anaphoric pronominalization, on the assumption that the hearer can retrieve the topic. Then as an afterthought the speaker adds the topic NP after a pause, as an insurance policy, "just in case."

Now, when adverbial clauses are used as "afterthought topic" in Rwanda, the same constraint applies as when they are used in the more characteristic leftmost topic position, and the COMP-focus particle may not be used. Thus:

(37) a. Yohani a-ra-kora, mu-gitoondo 'John works, in the morning.' (VP focus)
   b. *Yohani a-ngo-kora, mu-gitoondo (*COMP focus)

\[15\] For some details on this discourse device, see Givón [1975b].
Topicalization of the subject constituent, either to left or right, ordinarily does not affect the focusing constraints discussed above, since they most characteristically pertain to the various members of the verb phrase, in which the new information in the sentence is most normally couched. Thus, for example, when the accusative object is indefinite, only the COMP-focus may be used, as seen in (31) above. And the same restriction holds when the subject is left or right topicalized:

(38) a. Yohani, y-à-riiye iffì 'John, he ate fish/a fish.' (COMP focus)
   b. *Yohani, y-àrá-riiye iffì (*VP focus)
   c. y-à-riiye iffì, Yohani 'He ate fish/a fish, John.' (COMP focus)
   d. *y-àrá-riiye iffì, Yohani (*VP focus)

Similarly, the COMP-focus particle is barred from constructions with a definite or pronominal object (viz (32) and (33) above) regardless of whether the subject is right or left topicalized:

(39) a. Yohani, y-àrá-yi-riiye 'John, he ate it.' (VP focus)
   b. *Yohani, y-à-yi-riiye (*COMP focus)
   c. y-àrá-yi-riiye, Yohani 'He ate it, John.' (VP focus)
   d. *y-à-yi-riiye, Yohani (*COMP focus)

On the face of it, there is really no transparent reason why the topicalization of subject NP's should influence the focusing situation within the verb phrase, since it still leaves the entire VP potentially as new information. However, there are a number of baffling examples in which the topicalization of the subject does make a difference. Consider first the sentences with the manner adverbial "hard"/"much" shown in (26a,b) above. When the subject NP is topicalized to the left, only the VP-focus aspect may be used, whereby the neutral pattern allows both focus possibilities:

(40) a. Yohani y-à-koze cyaane 'John worked hard.' (COMP focus)
   b. Yohani y-àrá-koze cyaane 'John worked hard.' (VP focus)
(40) c. *Yohani, y-à-koze cyaane (*COMP focus)
    d. Yohani, y-àrà-koze cyaane 'John, he worked hard.' (VP focus)

The other examples of this type are a bit easier to understand, since
the topicalized constituent includes—in the case where the restriction
shows up—both the subject and a participial-adverb complement:

(41) a. Yohani, n-à-mu-bonye akina 'John, I saw him playing.'
    (COMP focus)
    b. Yohani, n-àrà-mu-bonye akina 'John, I saw him playing.' (VP
    focus)

In (41a) the new information focus includes only the adverb complement,
while in (41b) it includes the verb. The same situation prevails when
the subject noun occurs by itself to the right:

(42) a. n-à-mu-bonye akina, Yohani 'I saw him playing, John.'
    (COMP focus)
    b. n-àrà-mu-bonye akina, Yohani 'I saw him playing, John.' (VP
    focus)

Now, if both the subject and adverb complement are right-topicalized,
i.e., the complement adverb is removed from the status of new informa-
tion, only the VP-focus particle may be used:

(43) a. n-àrà-mu-bonye, Yohani akina 'I saw him, John (,) playing.'
    (VP focus)
    b. *n-à-mu-bonye, Yohani akina (*COMP focus)

This case is thus not really baffling, since the right-topicalization
of the subject alone does not produce any change, but only when it is
also associated with the topicalization of the complement, leaving the
verb alone in focus.

4. Focus and Pronouns in Zulu

In Zulu the VP-focus particle has a rather minimal distribution,
confined only to one present tense. Unlike Bemba but very much like

\[16\text{For more details of the data see Kunene [1975].}\]
the emerging tendency in Rwanda, in Zulu the same verb phrase cannot accommodate the focus contrast. Rather, when a complement is present, only the COMP-focus form may appear, whereas when no complement is present, the VP-focus particle is obligatory:

(44) a. u-dla isiinkwa
    'He eats bread.' (COMP focus)
b. *u-ya-dla isiinkwa
    (*VP focus)
c. *u-dla
    (*COMP focus)
d. u-ya-dla
    'He eats.' (object unspecified) (VP focus)

Further, the VP-focus particle -ya- in Zulu is barred from negative and relative-clause environments, much like in Bemba and Rwanda. Also, pronominalization of the object, as in Rwanda, automatically narrows the focus to the verb alone:

(45) a. u-ya-si-dla
    'He eats it.' (the bread) (VP focus)
b. *u-si-dla
    (*COMP focus)

The very same restriction is observed when the object is coreferential with the subject and is reflexivized:

(46) a. umfana u-ya-zi-shaaya
    'The child hits himself.' (VP focus)
b. *umfana u-zi-shaaya
    (*COMP focus)

We have seen then, that while many of the constraints are the same, the situation in Zulu (completely) and in Rwanda (partially) represents a subtle departure from that of Bemba and English. In the latter, one may get a semantic contrast between VP scope of the assertion (VP focus) and the more limited COMP scope (COMP focus) whenever a complement is present. This communicative strategy allows—in non-contrastive context—the message to consist of one additional piece of new information, the complement, or alternatively two pieces—the complement and the verb. In Zulu (and to some extent in Rwanda), when a complement is present the scope of new information can only include that complement, and may not include the verb. Thus Zulu seems to have evolved the alternative, more restricted strategy outlined in (30) above, the
one allowing only one piece of new information per verb phrase ("pro-
position"). Since the only time the VP-focus particle appears is when
the verb alone is new information, obviously the mapping situation in
Zulu is at variance with the one given in (21) for Bemba. The differ-
ence may be characterized as:

(47)  

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<td>COMP-focus = verb not new information</td>
<td>COMP-focus = verb not new information</td>
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<tr>
<td>VP-focus = verb included in new information</td>
<td>VP-focus = only the verb is new information</td>
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Assuming for the moment that the less restrictive strategy, the one
used in Bemba and reflected at the semantic level—at least as a possi-
bility—in English, is the older one, can the change to the Zulu strat-
egy be explained as a natural change? It seems to me that it can, and
that what has occurred is a highly natural inferential extension by
which the uni-directional conditional is re-interpreted as bi-condi-
tional. The initial (Bemba) situation, viz. (47), may be characterized
as:

(48)  [the verb is old information] ⊃ [no VP-scope particle is present]

The normal inference from this, via modus tollens, will be:

(49)  [VP-scope particle is present] ⊃ [the verb is not old information]

However, if speakers interpret the rule in (48) as a biconditional, then
they are entitled to infer:

(50)  [no VP-scope particle present] ≡ [the verb is old information]

And from that by one step of extracting the negative:

(51)  [VP-scope particle present] ≡ [verb is new information]

This type of hypothesized extension represents an extremely common sort
of so-called "logical fallacy", by which an inclusion relation as in the
Bemba case of (47) may become an exclusion relation, as in the Zulu case.
5. **Discussion**

Most of what I have shown above is reasonably predictable from rather general facts about the universal pragmatic properties of negatives, relatives, topic-constructions, definites and pronouns. More intriguing and less obvious is the emerging suggestion that there exists a strategy of information processing in language such that the amount of new information per a certain unit of message-transaction is restricted in a fashion—say "one unit per proposition." The difficulties of elucidating this strategy are considerable, since so far no one has defined either the "bit" unit of new information or the "proposition" unit of message-transaction. Nevertheless, it seems to me that a number of facts can be sketched out which may have a bearing on this possibility. To begin with, there are facts that concern upper-limit constraints on the "normal" number of arguments associated with verbs. I have commented elsewhere [Givón, 1972] on the seeming tendency for languages to have verb classes which are sub-categorized with respect to two object arguments but never more. Even verbs which potentially could be sub-categorized with reference to three nominal object arguments, such as "transfer verbs" as in:

(52) \( x \) moved \( y \) from \( z \) to \( q \)

or exchange verbs such as:

(53) \( x \) bought \( y \) from \( z \) for \( q \)

seem to take the third argument only optionally, but are never obligatorily sub-categorized with respect to three object arguments.

The next fact concerns verbs which take two object nominal arguments, where most commonly the non-accusative one is a dative or locative. As is well known, subject arguments tend to be definite. But while accusative objects show, on average text counts, about fifty percent indefinites, dative objects tend to be on the average ninety to

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17 Where \( q \) stands for the exchange price, not the benefactive.

18 But the skeptic may consult Keenan [1975] or Givón [1975b].
ninety-five per cent definite, and locative objects around eighty per cent definite. In other words, in verb phrases, which carry the assertion or new information in sentences, in addition to the verb having the normal possibility of representing new information, only one more argument or bit of new information is normally added—and this one is indefinite only in fifty per cent of the cases. Taking the "sentence", however awkwardly defined, as the message-transaction unit, and verbs, nouns or adverbs as bits of information, the frequency considerations outlined above already suggest, by themselves, that in text counts of English, a language which at the "competence" level conforms to the less-restrictive strategy of Bemba rather than the more restrictive strategy of Zulu, the ratio of bits per proposition is already smaller than two.

Another set of facts come from Kirsner [1973], where he observed that a direct correlation exists between the definiteness of subjects of active sentences and the frequency of occurrence of one or two object NP's, so that sentences with definite subjects tend to have more object arguments than sentences with indefinite subjects. In other words, when the subject is not new information, the proposition may more frequently allow other possible bits of new information, i.e., object NP's. Further, Kirsner [1975] has shown a similar correlation in passives: when the subjects of passives are definite, the frequency of an overtly-mentioned underlying agent is higher, while when the subject is indefinite, i.e., itself new information, the frequency of overtly mentioned agent arguments is lower. This strongly suggests the presence of some sort of upper-bound phenomenon constraining the number of arguments—or potential bits of information, and this upper-bounds constraint seems to depend on the status of the least dispensible argument of the proposition, its subject, i.e., whether it is itself new or old information.

The last set of facts concerns a well known universal of WH

\[19\] For the actual text counts, see Givón [1975d]. The counts represent the "base line" of main, affirmative, active, declarative clauses.
questions, i.e., the fact that, in general, they tend to only query one argument at a time, such as subject, accusative, dative, locative, time, manner, etc., while the rest of the proposition which underlies both the question and the elicited answer is presupposed. This is a strong reflection of the strategy of "one bit of new information per proposition", since in fact this strategy in the query, if successful, virtually insures that the very same communicative strategy will also be maintained in the reply. While query strategies are not necessarily the only type of discourse strategy used in communication, it is nevertheless a rather important one, representing situations where the speaker deliberately attempts to restrict the scope of new information to one-bit-at-a-time. I see no reason to assume that this is not another reflection of a rather universal communicative strategy, in which the bulk of the communicative transaction consists of presupposed material, i.e., old information used to insure commonality of background/context/world-view between the speaker and the hearer, and only a small chunk consists of the actual message, new information.

20 Two most common exceptions of "double WH" are (i) discourse misunderstanding and request for repetition, as in 'Who saw whom yesterday?', and (ii) respective, pair-wise lists, such as 'Who loves whom?' intended to elicit answers such as 'John loves Sheila and Bill loves Suzanne.'
REFERENCES


THE NON-CORRELATION OF TONE AND VOWEL HEIGHT IN HAUSA

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1. Introduction

In Pilszczikowa-Chodak [1972] (henceforth abbreviated as P-C) it is argued that there is a positive correlation between tone and vowel height in Hausa: "We can ... definitely posit that the tone and the degree of vowel height in the termination of the verb and noun plurals are correlated" (p. 420). Specifically the claim being made is that Hausa verbs and noun plurals ending in /i/, /u/, /e/, or /o/ (the [+h] vowels) normally have final High tone, whereas those ending in /a/ (the one [-h] vowel) have final Low tone.¹

Given the current interest in the interrelationship of tone and segmental features (e.g., Hyman [1973]), the impressive article by P-C is bound to attract the attention of general phonologists, most of whom will not know Hausa and thus will have no alternative but to accept P-C's presentation at face value. It thus becomes a matter of considerable importance to set the record straight; for the facts show in unmistakable terms that the tone/vowel height correlation ascribed to Hausa does not exist. One is often prepared to accept an attractive hypothesis in spite of quite numerous exceptions and unexplained counter-examples; but in this case the evidence against the putative tone/vowel height (T/VH) correlation is so widespread and general as to completely refute it. In what follows I shall present some of the more significant counter-evidence, first with reference to the putative T/VH correlation with verbs and then with noun plurals. In both cases I shall limit myself to a straightforward presentation of the facts, with discussion

¹The feature of vowel height will be indicated by lower case [h] while tone will be indicated by upper case [H]. A vowel indicated within slant lines, e.g. /a/, represents that vowel whether long or short. Since P-C ignores vowel length as far as tone/vowel height correlation is concerned, I shall do the same in my discussion. In examples, however, long vowels will be distinguished from short by doubling the letter.
kept to an absolute minimum in the interest of brevity.

2. The Verb

In Parsons' [1960] classification of Hausa verbs, adopted by P-C, verbs fall into seven morphologically distinct classes known as "grades". Taking disyllabic verbs as they occur when not followed by an object, one finds the following forms:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Example</th>
<th>Final Vowel</th>
<th>Final Tone</th>
<th>T/VH correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>kāamāa</td>
<td>-aa</td>
<td>Lo</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>'catch'</td>
<td>[-h]</td>
<td>[-H]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>sāyāa</td>
<td>-aa</td>
<td>Hi</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>'buy'</td>
<td>[-h]</td>
<td>[+H]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ʃt̪ā</td>
<td>-a</td>
<td>Hi</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>'go out'</td>
<td>[-h]</td>
<td>[+H]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>rūfēe</td>
<td>-ee</td>
<td>Lo</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>'close'</td>
<td>[-h]</td>
<td>[-H]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>cīyār</td>
<td>----</td>
<td>Hi</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>'feed'</td>
<td>C-final</td>
<td>[+H]</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>dāawōo</td>
<td>-∞</td>
<td>Hi</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>'return'</td>
<td>[+h]</td>
<td>[+H]</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>sàadū</td>
<td>-u</td>
<td>Hi</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>'meet'</td>
<td>[+h]</td>
<td>[+H]</td>
<td></td>
</tr>
</tbody>
</table>

Out of the six grades in which the verb ends in a vowel, in three, tone and vowel height are correlated and in an equal number the two variables are not. P-C's explanation for the non-correlation in grade 4 is that this grade "does not exhibit its own pattern [but rather] utilizes the pattern of grade 1" (p. 412). This may be true, but if so it simply supports the traditional view that verb tone in Hausa is determined by morphological factors, independent of any correlation that might or might not be found between the tone and height of the final vowel. The explanation offered for the "wrong tones" of the a-final grades 2 and 3 is that they "reveal the reverse order of the
high-low pattern of Grade 1" (p. 412). Even if this suggestion were true, it is hard to see in what way it could be relevant to the question at hand since the V/TH correlation is supposedly based on a study of surface forms in the present-day language. But in fact, the hypothesized tone reversal is without empirical support whatsoever and is completely at variance with what we know about the history of (including tonal stability of) Hausa verb classes [Newman 1973, 1975].

According to P-C (p. 410) "the object pronoun in Hausa has to be considered as a verb pronominal suffix in spite of its separate appearance in writing. A major reason for assuming this is that "from the tonal analysis perspective there is no difference between the tone patterns of bisyllabic verbs with their object pronoun ... and tri-syllabic verbs of Basic Grades" (p. 410). Thus, e.g., we find hànà-tá 'prevent her' tonally corresponding to kàràn-tá 'read' and hàrbée-sù 'shoot them' corresponding to tàmbàyà 'ask', etc. Note, however, that in offering this analysis,² P-C is thereby presenting further evidence of the non-dependence of tone on vowel height, for all object pronouns in Hausa behave as a set and exhibit identical tonal behavior whereas the height of their vowels differ, e.g.,

<table>
<thead>
<tr>
<th>(2)</th>
<th>Example</th>
<th>Final Vowel</th>
<th>Final Tone</th>
<th>T/VH correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>...kámàa-ní</td>
<td>-í</td>
<td>Hi</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>'...catch me'</td>
<td>[+h]</td>
<td>[+H]</td>
<td></td>
</tr>
<tr>
<td>Grade 1</td>
<td>...kámàa-kà</td>
<td>-a</td>
<td>Hi</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>'...catch you'</td>
<td>[-h]</td>
<td>[+H]</td>
<td></td>
</tr>
<tr>
<td>Grade 2</td>
<td>...sàyêe-shì</td>
<td>-í</td>
<td>Lo</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>'...buy it (m)'</td>
<td>[+h]</td>
<td>[-H]</td>
<td></td>
</tr>
<tr>
<td>Grade 2</td>
<td>...sàyêe-tà</td>
<td>-a</td>
<td>Lo</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>'...buy it (f)'</td>
<td>[-h]</td>
<td>[-H]</td>
<td></td>
</tr>
</tbody>
</table>

²My own opinion is that this analysis is correct only in the case of grade 2 and does not hold in the case of grade 1 nor any of the non-basic grades.
In addition to the verbs normally included within the framework of Parsons' grade system, Hausa has a number of very common disyllabic verbs ending in the high vowels /i/ and /u/. While a few of these verbs have Lo-Hi tone, thereby matching final tone and vowel height, most have Hi-Lo tone in violation of the supposed correlation, e.g.,

<table>
<thead>
<tr>
<th>Verb</th>
<th>T/ VH Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>taffe</td>
<td>'go' Yes</td>
</tr>
<tr>
<td>gaji</td>
<td>'tire' Yes</td>
</tr>
<tr>
<td>rooshi</td>
<td>'be replete' Yes</td>
</tr>
<tr>
<td>taashl</td>
<td>'get up' No</td>
</tr>
<tr>
<td>faadl</td>
<td>'fall' No</td>
</tr>
<tr>
<td>mutu</td>
<td>'die' No</td>
</tr>
<tr>
<td>gudu</td>
<td>'run' No</td>
</tr>
</tbody>
</table>

3. Noun Plurals

Hausa is well-known for having a large number of ways of forming noun plurals. According to P-C, the various plural patterns all obey the same T/VH correlation rule, i.e., they all end either in /a/ and Lo tone or else in one of the high vowels and Hi tone. As far as final Lo tone plurals are concerned, this is actually true: all plurals with final Lo tone end in /a/ and only /a/, e.g., daska 'room' pl. dakaunaa; gari 'town', pl. garurwaa; codaki 'spoon', pl. codakulaa. However, it is not true that tone and vowel height match in the case of plurals with final Hi tone. In addition to the plurals ending in Hi tone /i/, /e/, /u/, and /ai/, there are also equally important classes of plurals ending in Hi tone /a/. I shall present six such plural classes that violate P-C's T/VH correlation rule, the first three being plurals of simple nouns, the latter three being plurals of derivative forms. With the exception of plural class (c), these are all productive or semi-productive plural patterns for which only a few representative examples have been cited.
3.1 Plural patterns ending in Hi tone /a/. (a) "Falling tone plurals": zóobè 'ring', pl. zóbbáa; gēeфèe 'edge', pl. gyâffáa; shúuddìi 'blue thing', pl. shūddáa; yâaròò 'boy', pl. yâaráa (slightly irregular member of this class).

This is a large and lexically varied plural class which by its size conspicuously contradicts the assertion of T/VH correlation in Hausa plurals. P-C (p. 419) suggest that "such plurals were originally constituted of three syllables"; but this is totally irrelevant since hypothetical forms such as *zóobàabáa and shúuddàadáa would obviously violate the T/VH correlation rule just as much as the actually occurring forms.

(b) "Internal-a plurals": sfì'dìi 'saddle', pl. sfì'adáa; gûnlì 'idol', pl. gûmàakáa; zúucìyyáa 'heart' (*zûktìi plus feminine suffix), pl. zûkàatatáa.

A point worth making here is that all internal-a plurals in Hausa have Hi-Lo-Hi tone no matter what the final vowel is, e.g., gûrgùù 'cripple', pl. gûràagûù; kûncìi 'cheek', pl. kûmàatûù; jìrgìi 'boat', pl. jîrràgéé; kàskòò 'bowl', pl. kàsàakée. In other words, the Hi-Lo-Hi tone pattern is an intrinsic property of this class of plurals and has nothing to do with final vowel height.

(c) "Hi-Hi final-a plurals": fôujèe 'house-fly', pl. fôudoa (now usually treated as sg.); ìfiìì 'home', pl. ìfòdàa (now usually treated as sg.); mfììì 'male/husband', pl. mázàa; ìrrìéëe 'pagan', pl. áûnàa; màatáa 'wife', pl. màatáa; ìfyàa 'daughter' (W. Hausa), pl. ìfyàa.

This is an archaic plural class made up of a small number of basic words. It is paralleled by another small class of Hi-Hi plurals formed by replacing the final vowel of the singular by /u/, e.g., mâashìì 'spear', pl. màasûù; nàmàà 'animal', pl. nàmùù; yâatsàa 'finger', pl. yâatsûù. As in the case of plural class (b), the tone pattern of these plurals seems to be a property of the plural class as such rather than being a function of the final vowel that occurs with particular
sub-members of the class.

Since P-C does not discuss derived noun forms, I shall simply illustrate the following three plural classes without additional comment.

(d) "Agential nouns": mánòomī 'farmer', pl. mánòomá; máròokī 'beggar', pl. máròoká; má'āikàcfi 'worker', pl. má'āikàtáa.

(e) "Occupational/ethnic nouns": báfáaddle 'courtier', pl. fáadáawa; dáttfíljó 'elder', pl. dáttàawáa; báháushèe 'Hausa', pl. hàusàawa; bákànde 'Kano man', pl. kánáawa.

(f) "Adjectival nouns" (see Parsons [1955]): kàkkárfáa 'strong one', pl. kárfàafáa; wàwwàaráa 'smelly thing', pl. wáaràaràa; zàzzáafáa 'hot thing', pl. záafàafáa.

3. Conclusion

From the time of the discovery of tone in Hausa by Taylor [1923] scholars have been struck by the fact that there is something qualitatively different about the Hausa tonal system when compared with that of a language such as Yoruba. One area in which this difference manifests itself is the high degree to which tone in Hausa seems to be predictable, either in terms of morphological/grammatical categories or in relation to other phonological variables (see Leben [1971]). The suggestion that tone and vowel height might be related to one another was therefore fully consistent with the kind of discovery about Hausa tone that one was predisposed to accept. In this sense P-C's hypothesis that final tone and vowel height of verbs and noun plurals were positively correlated was a good hypothesis. It was imaginative, it was reasonable, and it was testable—but, as the evidence presented above shows, it was wrong.
REFERENCES


