STUDIES
in
AFRICAN LINGUISTICS

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IN DEFENCE OF THE SKELETAL TIER*

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This paper investigates empirically the viability
of a hypothesis (advanced by Lowenstamm & Kaye
[1986]) that morphological classes (in particular,
those typical in languages with nonconcatenative
morphologies) are fully definable in terms of syl-
labic structure. This hypothesis has theoretical
significance, for, if correct, the skeletal tier—
generally regarded as a core object in autoseg-
mental phonology—becomes a derivative and, conse-
quently, redundant entity. Data from four Ethio-
pian Semitic languages are presented as evidence
that it is not always possible to posit unique
syllabifications for morphological classes and
that underlyingly many such classes are only
partially syllabified, full syllabifiability be-
ing secured by processes occurring later in the
derivation. Analyses are proposed for the data,
which demonstrate the necessity for a non-deriv-
ative skeletal tier.

1. The Skeletal Tier vs. Syllable-Based Templates

For the past eight or so years a substantial portion of the success that
has been enjoyed within Autosegmental Phonology has been due to the recogni-
tion of the "CV tier". The CV tier (or some functionally similar entity—
see section 2) serves within a multitiered phonological representation as

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the base to which elements of otherwise mutually independent tiers are asso-
ciated. It has, then, a mediating role in interrelating reciprocally autono-
mous tiers. The most important aspect of such a function is that the CV tier
furnishes the programme for temporal coordination within phonology, and for
this reason the CV tier is often referred to as the "timing tier". Referring
all matters involving phonological timing to the CV tier (rather than treat-
ing them as properties of segments) has provided satisfying solutions for
such longstanding problems as the analysis of vowel and consonant length and
the analysis of complex segments of various sorts. Most recent literature
on the subject has been at pains to point this out. For a particularly
clear overview see Clements [1986].

A number of arguments justifying the recognition of the CV tier are ad-
vanced by Clements and Keyser in Chapter 3 of their 1983 monograph. Their
first argument (pp. 64-66) is based upon McCarthy's extensions of the princi-
ples of Autosegmental Phonology to handling the problems of non-concatenative
morphology of the type commonly (though not exclusively) found in Semitic
languages [McCarthy 1979, 1981, 1983]. For the present purpose it is not
necessary to go beyond this first argument, for it is precisely on account of
purportedly simpler analyses that have recently been advanced for problems of
this type that the CV tier has been declared redundant.

The essential insight of McCarthy's model consists in distinguishing
three morphemic elements at the level of phonological representation for
stems exhibiting non-concatenative morphology:[1]

(i)   The "Consonantal Melody": In Semitic languages this consists of two,
        three, or four consonants bearing the basic lexical identity of the
        root.

(ii)   The "Vocalic Melody": In Semitic languages this consists of one or
        more vowels which together with the "prosodic template" bear grammati-
        cal (and sometimes lexical) information.

(iii)   The "Prosodic Template": This defines the canonical shape of a given
        stem form in terms of C and V elements.

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[1]"Non-concatenative morphology" is morphological structure exhibiting
discontinuity, infixation, etc.

It is not possible simply to recognize only a consonantal skeleton within which vowels are interdigitated any more than it is possible to posit a basic vocalic skeleton between the elements of which the various components of the consonantal melody are slotted. The reciprocal discontinuities of consonantal and vocalic melodies require the intermediation of the prosodic template because both melodies give evidence of having autosegmental status. For example, each of them is independently subject to principles governing autosegmental entities.[2]

The linking of elements of the two melodic tiers to the C and V elements of prosodic templates is accomplished for the most part by means of conventions of association that within the theory of Autosegmental Phonology are conceived of as belonging to Universal Grammar, so that language specific rules are kept to a minimum. For a general account of this the reader is referred to van der Hulst and Smith [1985:11-29].

In a recent paper, however, Lowenstamm and Kaye [1986] have argued that the CV tier is redundant since its function can be adequately performed by the syllabic structure, which, of course, has often been conceived of as an independently necessary autosegmental level (cf. Clements and Keyser [1983], Halle and Vergnaud [1980]). The essential premise for Lowenstamm and Kaye's argument is their assumption that phonological representations have full prosodic, i.e. syllabic, structure from the outset. This assumption is one which has been advanced in earlier publications of theirs (see in particular Kaye & Lowenstamm [1982]). Since in the analysis of very many languages there is a considerable degree of mismatch between phonological and phonetic structures as far as syllabification (or, indeed, syllabifiability) is concerned, the claim that phonological representations have full prosodic structure needs to be explained. For example, we expect processes such as epenthesis to create prosodic structure that does not exist at a more underlying level. Lowenstamm and Kaye's claim is made possible by positing null elements in the prosodic structure of phonological representations: prosodic

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[2]For example, both consonantal and vocalic melodies are independently subject to the Obligatory Contour Principle.

structure is erected fully with the inclusion of null elements at those nodes
of structure where they are required, i.e. at sites where epenthesis will oc-
cur.[3]

In spite of appearing to create an enormous degree of redundancy with re-
spect to lexical entries, such an approach promises high dividends as far as
epenthesis is concerned since it would enable us to dispense with the multi-
farious detail of language specific and context sensitive rules, replacing
them by a maximally simple characterization of the process, which would be
made available by Universal Grammar, viz. *Insert Segment* [Lowenstamm & Kaye
1986:102, 7ii].

An illustrative example would be provided by the East Cushitic language
Arbore, which exhibits a process which we may refer to as "post-laryngeal
epenthesis". An epenthetic copy of a single vowel preceding a laryngeal
(h , ʔ) is inserted after the latter when it is followed within a word by
any non-glottalized obstruent or a nasal, e.g.

(1) /leh-t-aw/   →   [leɦetaw][4]   'my ewe'
     ewe-fem.-1st sg. possessive

(2) /seʔ-t/aw/   →   [seʔetaw][4]   'my cow
     cow-fem.-1st sg. possessive

The same language displays another process which may be labelled "I-epenthe-
sis", which occurs at the juncture of a sequence of two (dissimilar) conso-
nants with a third consonant or at a word boundary, e.g.

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[3]Epenthesis is not the only means whereby null elements may be resolved.
The other means which is specifically mentioned by Lowenstamm and Kaye is re-
syllabification [1986:101ff.]. Although Lowenstamm and Kaye adopt the idea
that epenthesis involves the substitution of a null element in the prosodic
structure by a real segment, the proposal is not without precedents. The
idea can be traced back to an unpublished paper by Halle and Vergnaud [1978],
and is also made use of in work by Selkirk [1981]. A comprehensive survey of
the notion of null elements and related issues in syllable theory is fur-
nished by Itô [1986].

[4]Diaresis under a segment symbolizes breathy phonation (according to IPA
usage). A single dot under a vowel letter symbolizes laryngealization.

(3) /daNf-t-e/   → [daŋfitɛ]   'it boiled'
     boil-fem.-perfect

(4) /daNf/   → [daŋfi]   'boil!'

Rules that might be proposed for these processes would probably need to refer to the specific syllable structure constraints of the language and (in the case of the first process at least) to particular features of segments in the environment. In other words, the essential similarity of the two processes could hardly be expressed without reference also to certain presupposed or attendant factors. Under the proposal made by Lowenstamm and Kaye, however, the quintessential generalization is given straightforward expression. Thus, appropriate underlying representations for [sẹʔẹtaw] 'my cow' and [daŋfitɛ] 'it (feminine) boiled' might be as follows:

(5) σ σ σ   (6) σ   σ   σ
     /\ /\ /\   /\   /\ /\
     s e ʔ Ø t a w   d a N f Ø t e

In both cases the null elements (Ø) in the underlying prosodic structure come to be "associated with" ("replaced by" ?)[5] an epenthetic segment. The simplicity and generality of all this is very attractive.[6]

The redundancy inherent in distinguishing a two-term vocabulary of C and V in the skeletal tier has been criticized on several occasions (see Levins [1983], Archangeli [1984]), and the analyses presented in the second part of this paper give recognition to that criticism. For the present purpose, however, whether the skeletal tier contains differentiated C and V elements or

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[5]It is not exactly clear to me what is implied by diagrammatic representations such as

      /\
    ./ Ø \.
       ↓
       i

(cf. Lowenstamm and Kaye [1986:101]; cf. also (18), (34), and (36) in the present paper, which are based on the original diagram).

[6]If such a proposal proved to be properly motivated, it would further enhance Archangeli's insightful suggestion that epenthesis inserts segments that from the point of view of distinctive content (within a given language) require the absolute minimum of specification (cf. Archangeli [1984:58]).

not is irrelevant; the real question is whether the skeletal tier itself is a redundancy, for if underlying canonical shapes can be defined fully by means of prosodic structure, where this is provided with a suitably constrained device of null elements, any form of skeletal tier will be unnecessary.

The relevance of this issue comes very much to the fore in the analysis of morphology of the Semitic type. Lowenstamm and Kaye report McCarthy as saying that the representation of his prosodic templates in terms of elements of the CV tier or in terms of elements of syllable structure were simply notational variants. They deny, however, that this is the case. They pinpoint the difference by envisaging a "Semitic hybrid" having an Arabic-type prosodic template of the form CVCCVC but incorporating the possibility of a certain type of branching onset for syllables, which is a feature permitted by Modern Hebrew (though not by Arabic). In such a language a triliteral radical such as k-t-b might license only one syllabification (as in (7)) whereas a radical such as s-b-r would be syllabifiable in two ways (as in (8) and (9)) on account of the fact that the sequence br is a permissible onset cluster, and given the markedness hierarchy for syllables in Modern Hebrew, (9) would present a less marked option than (8).

(7)

```
      σ        σ
     /\       /\
    C V C   C V C
        \   |  /
         k  t  b
```

(8)

```
      σ        σ
     /\       /\
    C V C   C V C
        \   |  /
         s  b  r
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(9)

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      σ         σ
     /\        /\
    C V C    C V C
        \    |  /
         s   b  r
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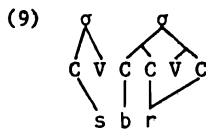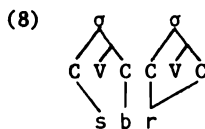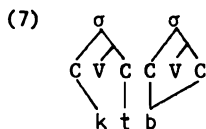
What the argument demonstrates is that in terms of the CV tier the potential for ambivalence for syllabification with a radical such as s-b-r is simply not captured and, furthermore, that since the prosodic structure *on its own* does capture it, the CV tier is unnecessary. Clearly McCarthy was incorrect in supposing that the two ways of representing prosodic templates were notational variants. But whether the ability to express such a distinction as

that illustrated by the hypothetical language example will make for any
greater overall insight may not necessarily be the consequence. Among the
languages to be considered below is one which exhibits a situation closely
akin to that elaborated by means of the hypothetical language, but it will
be concluded that in this case a significant generalisation would have to be
forfeited by an insistence that prosodic templates be defined syllabically.

Lowenstamm and Kaye [1986:122] then proceed to propose the following
principle ("Principle (55)"):

> "Morphological classes defined canonically must observe syllabic
> homogeneity."

The full context of the article makes it abundantly clear that when speaking
of "morphological classes" the authors are referring to entities of the type
for which McCarthy (and subsequently others) have taken over the term
binyanim from traditional Hebrew studies cf. sg. binyán , pl. binyāním).
The terms imposed by "Principle (55)" are very restrictive. The principle
requires a unique syllabification for all members of a particular morpholog-
ical class (hereafter abbreviated MC).[7] As its proposers point out, the
principle makes predictions as to how a process such as epenthesis will oper-
ate for a given MC. The operation of epenthesis with respect to certain MC's
of Arabic (discussed in McCarthy [1982]) is adduced as support for the prin-
ciple. Defined in terms of the CV tier the MC's in question have in common
the fact that they begin with the sequence CC: they are CCVCVC, CCVVCVC,
and CCVCCVC. Lowenstamm and Kaye (pace McCarthy) note

> "...that the initial consonant is resyllabified as the coda of the pre-
> ceding syllable when the stem follows a vowel-final word or prefix.
> ... Now consider the case where no vowel precedes the CC-initial stem.
> Since Arabic has no branching onsets, epenthesis must occur. But where?
>
> "In fact, the vowel is inserted before the CC-cluster. It could have
> been inserted between the two consonants. Principle (55) predicts

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[7]It seems clear that since in Lowenstamm and Kaye's theory units of
skeletal structure are, in fact, syllables which dominate various sets and
configurations of segmental terminal points, a conclusion such as that em-
bodied in Principle (55) is quite inescapable.

> this state of affairs; if the vowel were inserted to the right of the
> first consonant, i.e., CiC- instead of iCC- , the initial consonant
> would constitute the onset of the first syllable; while in all other
> cases, this consonant occupies a coda position." (p. 123)

The point is made very clearly; a MC defined in terms of the CV tier is
neutral with respect to where epenthesis will occur. If we consider the case
of the CCVCVC template the potential violation of the syllable structure con-
straint in Arabic against branching onsets would be obviated just as well by
the epenthesis in (10) as by that in (11).

(10). ⌊   C V C V C V C   (11) ⌊   V C C V C V C
        ⌊ ω   ↑   ⌊ ω ↑
              ∅   ∅
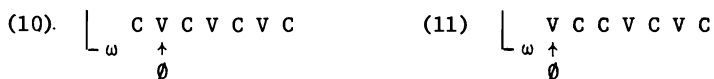
A syllable-based definition of the same MC (making use of a null element in a
nuclear position), as in (12), predicts only one possibility for epenthesis,
and so provides a more adequate grammar.

(12)   σ   σ   σ
         ∧   ∧   ⌒
        ∅ C   C V   C V C

    The behaviour of epenthesis in Arabic then certainly appears to come out
in support of Principle (55). I believe, however, that this is purely fortu-
itous. This opinion rests upon the fact that in some languages having the
same type of morphology as Arabic there are epenthetic processes which sim-
ply do not permit us to posit a unique underlying syllabification for a MC.
    The data to be considered come from certain Semitic languages spoken in
Ethiopia, namely, Amharic, Chaha, Tigrinya, and Harari.

1.1. <u>Case 1: The Amharic Jussive (Type A) Stem</u>. Comparison of surface
forms of the affirmative paradigms of the Imperfect and Jussive show that the
latter lacks forms for the second person.[8] The paradigms presented are those

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[8]The main function of the Jussive is the expression of indirect commands
and (when interrogative), requests for permission. Triliteral verbs in Ethi-
opian Semitic belong to two main classes, which have commonly been referred
to in the literature as Types A and B. The division goes back to the proto-
language, where the characteristics of the two classes (represented by s-b-r

of the triliteral (Type A) radical z-f-n 'dance'.

(13) <u>Affirmative Imperfect</u>   (14) <u>Affirmative Jussive</u>

'I (etc.) dance'   'let me (etc.) dance!'

1s   ɨzäfnallähu   1s   lɨzfän

2ms tɨzäfnalläh   2ms

2fs tɨzäfňalläš   2fs

3ms yɨzäfnall   3ms yɨzfän

3fs tɨzäfnalläč   3fs tɨzfän

1p   ɨnnɨzäfnallän   1p   ɨnnɨzfän

2p   tɨzäfnallaččɨhu   2p

3p   yɨzäfnallu   3p   yɨzfänu

The affirmative paradigm of the Imperative given in (15) could also be re-
garded as defective, since it has only second person forms.

(15) <u>Affirmative Imperative</u>

'dance!'

2ms zɨfän

2fs zɨfäňi

2p   zɨfänu

To "fill the gap" in the paradigms of (14) and (15) by merging them is an ob-
vious move and one which gives recognition to the long established practice
of scholars of the language (cf. Cohen [1936:179], Dawkins [1960:26]).

The claim that Jussive and Imperative forms make up a single paradigm

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'break' and f-s'-m 'finish') have been reconstructed as follows [Hetzron
1972:22ff.]:

	Perfect	Imperfect
Type A	*säbärä	*yɨsäbbɨr
Type B	*fäs's'ämä	*yɨfes's'ɨm

Subsequent developments in the two main groups of Ethiopian Semitic, i.e.
North Ethiopic (the group to which Tigrinya discussed as Case 3 in this paper
belongs) and South Ethiopic (the group to which the remaining languages dis-
cussed here belong), have obscured some of the original features, but the
classes have nevertheless remained distinct throughout much of their para-
digms.

would lead us to expect the stem to constitute a single unitary MC. This explanation holds very obviously for other paradigms such as the Perfect, where each verb type seems to present an invariant stem form. (In the following examples the canonical shapes are presented in an informal way.)

(16)   <u>triliteral</u>   <u>quadriliteral</u>

   <u>Types A & B</u>   <u>Type C</u>

   $C_1 \ddot{a} C_2 C_2 \ddot{a} C_3 -$ $C_1 a C_2 C_2 \ddot{a} C_3 -$ $C_1 \ddot{a} C_2 \ddot{a} C_3 C_3 \ddot{a} C_4 -$

But an examination of (14) and (15) reveals stem allomorphy, viz. -zfän- ∿ zɨfän- (*ɨzfän) . If we assume that the stem form (defined in terms of C and V) is CCVC, the longer alternant can be accounted for by means of epenthesis. Amharic syllabic structure permits no branching onsets (cf. Part II, Case 1.). In affirmative Imperative forms, where a CC cluster might otherwise occur initially in the word (and syllable), epenthesis operates to split the sequence. To handle this alternation with reference to syllable structure would require us to define the stem shape with an onset consonant initially, as in (17). The surface alternant zɨfän would be derived as in (18).[9]

(17)
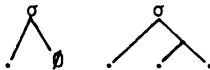
(18)
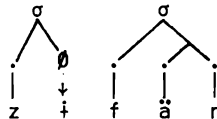
The prefixed forms, however, would require the initial stem consonant to belong to the coda, viz.

(19)

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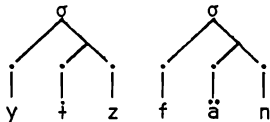
[9]In representing the CV skeleton as a series of dots in this section of the paper, I am simply following the practice of Lowenstamm and Kaye, viz.
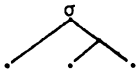
Now the ɨ in yɨzfän can itself be regarded as epenthetic, for comparison
of the forms of this same morpheme show the ɨ to be in alternation with ze-
ro, e.g

(20) yɨzäfnall   'he is dancing'

      ayzäfnɨmm   'he is not dancing'

Furthermore, in the form

(21) b[i·]zäfɨn (← bɨyzäfɨn ← b-y-zäfn)

      if he dances

we find further complications: (i) there appears to be a third alternant of
the 3ms prefix, [i·] , which derives from an epenthetic ɨ preceding the y-
(by a late phonetic rule the two segments undergo coalescence); (ii) there is
an alternant for the Imperfect stem, i.e. zäfɨn . This alternant is also
accounted for by epenthesis. Although Amharic word structure does permit syl-
lables with multiply-branched rhymes in final position, Amharic syllable
structure does not allow this kind of rhyme structure when the ultimate seg-
ment has greater sonority than the penultimate one. Once more epenthesis
saves the day! If, however, we attempt to define the Imperfect stem in a
syllable-based way, we again find that the final consonant behaves sometimes
as an onset (22) and sometimes as a coda (23).[10]

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In section 2 I represent the Skeletal Tier employed there as a series of X
slots. The distinction, however, is not simply one of graphic notation. Lo-
wenstamm and Kaye's dots are totally derivative since each one corresponds to
a terminal node of prosodic structure. Furthermore, their contention is that
if this proves always to be the case (and they stress that this is an empiri-
cal issue), then the Skeleton, in whatever way it is symbolized, is redundant.
In the representations used in section 2 some X slots occur that do not cor-
respond to terminal nodes of prosodic structure and are, therefore, not de-
rivative.

[10]One suspects that exactly the same ambivalence with respect to syllabic
categories must also arise in the Arabic examples discussed by Lowenstamm and
Kaye [1986:123] since the addition of a vowel-initial inflection to a conso-
nant-final stem would automatically require resyllabification of the final
consonant. Thus, a template such as CCVCVC with the prosodic structure hy-
pothesized in (12) would presumably take a vowel-initial suffix such as
-u(n) , -o , etc. in the 3(m)p, and then resyllabification would be neces-

(22) [diagram: syllable trees over segments] y ɨ z ä f n a l   (23) [diagram: syllable trees over segments] b ɨ y z ä f ɨ n
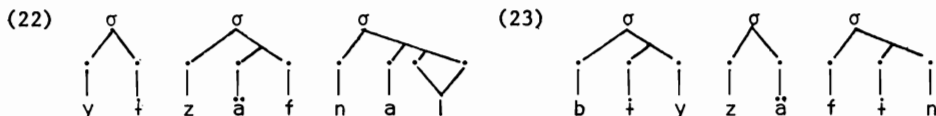
Elsewhere I have attempted to demonstrate that the overwhelming majority of occurrences of the high central vowel ɨ in Amharic have to be regarded as epenthetic [Hayward 1986]. The important thing about this process is that it scans word-sized[11] strings of segments rectifying any prosodic deficiencies by the creating of syllable heads but without any regard to predesignated prosodic categories, e.g. onset or coda, of stem consonants.

Of course, the initial identification of the Imperative and Jussive as one MC might be objected to; after all, the Imperative forms not only have a different stem shape, they also differ from Jussive forms in having no prefixes. Inspection of the following Negative Imperative forms shows (i) the presence of prefixes throughout and (ii) the same stem alternant, viz. -zfän- , as that found in the affirmative Jussive.

(24) <u>Negative Imperative</u> 'do not dance!'

   2ms attɨzfän   2p attɨzfänu

   2fs attɨzfäɲi

Consideration of other verb types also points solidly to the conclusion that the Imperative and Jussive stems do indeed belong to one MC.

(25)   <u>Type B</u> 'hide (tr.)'   <u>Quadriliteral</u> 'overturn'

   3ms Jussive   yɨdäbbɨk'   yɨgälbɨt'

   2ms Imperative   däbbɨk'   gälbɨt'

1.2. <u>Case 2: The Chaha Jussive II Stem.</u> According to Leslau [1983], there are two Jussives in Chaha.[12] One of them has the generalized stem shape

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sary, viz.

[diagram] ∅ C C V C V C   vs.   [diagram] ∅ C C V C V C - u
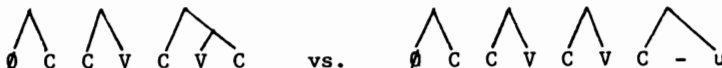
[11]By "word-sized" I mean that such strings are morphologically complete, even if only partially syllabifiable.

[12]Chaha is one of the more important and better studied of the "Gurage"

$-C_1C_2\ddot{a}C_3-$ and is virtually confined to intransitive verbs. The other one
(here termed Jussive II), which is found for all other simple triliteral
verbs, has two stem shapes, viz. $-C_1C_2\dotplus C_3-$ and $-C_1\dotplus C_2C_3-$. In his origin-
al descriptions Leslau [1951a, 1951b] presented these two as distinct types,
but in his later accounts [1964, 1983], he provides a wealth of data to jus-
tify his analysis that the two forms are in complementary distribution.
Quite clearly the variability relates to the position of the ɨ vowel, and,
as Leslau shows, this is determined by phonetic features inherent to the con-
sonant radicals. In section 2 I try to motivate an analysis of this stem
based on syllabification procedures and epenthetic processes which have a
high degree of sensitivity to the relative sonorities of the root consonants.
Typical (3ms) forms of Jussive II exhibiting the two stem shapes are given
in (26).

(26) 3ms Jussive II forms

  a. yä-$C_1C_2\dotplus C_3-$ b. yä-$C_1\dotplus C_2C_3-$

|			
yägfɨr	'release'	yäsɨrt	'cauterize'
yäk'βɨr	'plant'	yätɨrx	'make incision'
yäkmɨr	'pile up'	yädɨrg	'strike'
yäft'ɨm	'block a hole'	yäfɨrm	'break bread'
yägɨm⋇	'bleed (tr.)'	yägɨmt'	'chew off'
yät'ɨβ⋇	'wash something'	yäk'ɨms	'taste'
yäsɨβ⋇	'think'	yädɨmd	'join'
yäsdɨβ	'curse (tr.)'	yät'ɨβk'	'be tight'
yäfk'ɨd	'permit'	yät'ɨβs	'fry (tr.)'
yänfɨg	'be mean'	yägɨdf	'break a fast'
yänk'ɨs	'limp'	yädɨfk'	'soak a cloth'
yätkɨs	'kindle (tr.)'	yäkɨft	'open'
yänfɨs	'blow (of wind)'	yäkɨtf	'cut up meat'

      (An effort has been made to select verbs displaying a wide range
      of consonant types in the C_2 : C_3 sequences. This has necessitated

languages. According to Hetzron's classification of Ethiopian Semitic, Chaha
belongs to the Central Western Gurage group of his Outer South Ethiopic divi-
sion [Hetzron 1972, 1977].

> utilizing some verbs (marked with an asterisk) which on the surface
> do not appear to be triradicals. At a more abstract level of rep-
> resentation, however, I would claim that these verbs have indeed to
> be analysed as triradicals. The analysis of parallel forms to
> these which are found in Amharic is taken up in Alemayehu Haile
> and Hayward [in preparation].)

Without entering into details (which are taken up in section 2), it can be
seen that in the forms of (26a), C_3 has a greater sonority than C_2, while in
the forms of (26b) this is not the case.

Assuming Leslau to be correct in setting up a single MC for forms such
as those presented in (26) obliges us to relinquish any insistence on syl-
labic homogeneity for such classes. The mismatch between the syllable struc-
tures of (27a) and (27b) is most striking.

(27) a.

```
        \             σ              b.              σ
         \          / \                            / | \
          \        /   \                          /  |  \
 .   .  .  .   .    .         .   .   .   .   .   .
 |   |  |  |   |    |         |   |   |   |   |   |
 y   ä- g  f   ɨ    r         y   ä-  s   ɨ   r   t
```
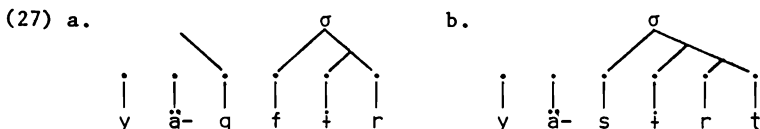
It should be noted that Chaha provides an example of a scenario of the
sort sketched by Lowenstamm and Kaye for their "Semitic hybrid", for we have
what purports to be a single morphological class with two distinct possibili-
ties for syllabification.

In a synchronic analysis utilizing the CV tier—at least a generative one
operating with morpheme invariance—we might seem obliged to choose between
(28a) and (28b) when positing a unique underlying morphological template for
Jussive II.

(28) a. -CCVC-   b. -CVCC-

Expressed in terms of syllable structure, these entities would have to be
analyzed as in (27a) and (27b) respectively. It will be noted that in (27a)
the initial C has to be syllabified as a coda of some preceding syllable.
Now a consideration of syllable markedness might lead us to opt for (28a),
since it contains a simpler syllable type, viz. C.CVC, and CVCC syllables
are not only universally more marked [Kaye and Lowenstamm 1982], but are rec-
ognized as such by Chaha word structure, which tolerates them only finally.

It would not seem possible to derive surface alternants containing the -CVCC-
stem without invoking a transformational rule of metathesis. Faced with an
analysis requiring recourse to this sort of rule might incline us to drop
the analysis of Jussive II as a single MC in favour of one with two MC's,
thus reverting to Leslau's earlier analysis.

There is, in fact, another possibility open to us. I believe that it is
not only possible but independently desirable to analyze occurrences of the
high central vowel ɨ in Chaha verb forms as resulting from epenthesis,
just as in Amharic. Thus, we are enabled to set up a unitary morphological
template, viz.

(29) -CCC-

A rule of epenthesis, which is sensitive to the relative sonorities of conso-
nants that come to be associated with the last two C slots, derives the two
alternants (cf. the case taken up in 2.2). It should be noted, however,
that even with ɨ supplied epenthetically, no unique (homogeneous) syllabic
structure can be assigned to (29).

1.3. Case 3: The Tigrinya (Type A) Imperfect. The Imperfect stem of the
so-called Type A triliteral verbs in Tigrinya poses an interesting problem.
An examination of the paradigm of s-b-r 'break' given in (30) (pace Leslau
[1941:Tableau VI]) reveals two stem alternants, the shorter of the two occur-
ring whenever an inflectional suffix is added.

(30) Type A Imperfect
      'I (etc.) am breaking'

1s	ʔɨsäbbɨr	1p	nɨsäbbɨr
2ms	tɨsäbbɨr	2mp	tɨsäbru(ta)
2fs	tɨsäbri	2fp	tɨsäbra(ta)
3ms	yɨsäbbɨr	3mp	yɨsäbru(ta)
3fs	tɨsäbbɨr	3fp	yɨsäbra(ta)

If we were to assume that the short alternant is closer to the underly-
ing stem form, we should need to derive the gemination of the second radical,
which would be an operation for which there would certainly be no motivation

in the phonology of Tigrinya; word forms terminating in sequences of single
C + ɨ + C being not at all uncommon. If, however, we start with the longer
form and (as for Amharic and Chaha) assume ɨ to be epenthetic, a plausible
analysis is available. This means that in terms of C and V the prosodic tem-
plate would be -CVĈCC-.[13] Tigrinya syllable structure permits neither branch-
ing onsets nor multiply-branching rhymes; thus given a morphological repre-
sentation for the 3mp such as

(31)
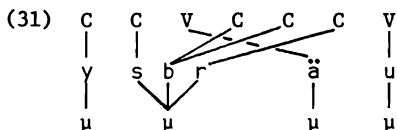
a rule degeminating the second radical and the insertion (post-lexically) of
ɨ between the prefix and stem would render the form fully syllabifiable,
viz.

(32)
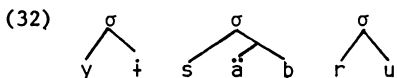
The other alternant preserves the gemination and achieves syllabification by
means of ɨ-Epenthesis. (The relationship between degemination and ɨ-Epen-
thesis as alternative modes of rectifying inadequate prosodic structure is
discussed in the case taken up in 2.3).

    The stem alternations of the Tigrinya (Type A) Imperfect pose considera-
ble difficulties for "Principle (55)". Making use of the theoretical device
of null elements for handling gemination as proposed in Lowenstamm and Kaye's
treatment of Tiberian Hebrew and Arabic (see especially pp. 117ff), we may
posit a syllable-based definition for this MC such as (33),

---

    [13]I have made use of a simplified symbolization for gemination here, i.e.
as ĈC. The fuller symbolization appears in example (38). Arguments which
justify treating gemination as involving a special configuration on the Skel-
etal Tier are presented in Hayward [in preparation]. A brief discussion of
the matter appears in the present paper in the introductory portion of sec-
tion 2.

(33)
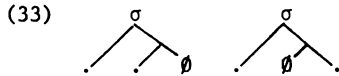
and derive the long alternant as in (34).

(34)
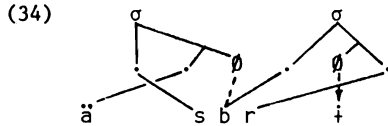
But it would seem likely that whatever means we adopt for deriving the short
alternant, we shall not be able in doing it to avoid changing the prosodic
categories (onset, coda) for both the second and third radicals.

1.4. Case 4: The Harari (Type A) Imperfect. Like Tigrinya Harari does not
permit multiply-branching rhymes; potential violations of this syllable
structure condition are avoided by an epenthesis involving the vowel ɨ .
According to Kenstowicz and Kisseberth [1979:223-225], who follow Leslau
[1958:17ff.], one situation where epenthesis is needed arises in those forms
of the Imperfect that lack a (word-final) inflectional vowel, i.e. all mem-
bers of the paradigm except 2fs, 2p, and 3p. Expressed in terms of C and V,
the template for the (Type A) triliteral Imperfect is -CVCC-. In the follow-
ing paradigm of č'-m-k' 'squeeze' epenthetically inserted vowels appear in
phonetic brackets.[14]

(35) Type A Imperfect
      'I (etc.) am squeezing'
      1s   ič'ämk'[ɨ]   1p n[ɨ]č'ämk'[ɨ]
      2ms t[ɨ]č'ämk'[ɨ]   2p t[ɨ]č'ämk'u
      2fs t[ɨ]č'ämk'i
      3ms y[ɨ]č'ämk'[ɨ]   3p y[ɨ]č'ämk'u
      3fs t[ɨ]č'ämk'[ɨ]

---

[14]It is not unlikely that the prethematic ɨ in the 1s is also epenthet-
ic. This can be maintained if we posit an underlying X slot for the 1s pre-
fix. This may be linked to the minimally specified consonantal segment, viz.
[ʔ] under certain conditions. Leslau [1958:3] does list glottal stop among

The fact that epenthetic ɨ appears word-finally means that throughout the paradigm the stem-final consonant maintains its prosodic categorization as an onset, viz.

(36)
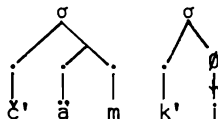
Harari then joins the Arabic case adduced by Lowenstamm and Kaye as evidence for their principle. But what does it amount to? Sometimes the principle holds, sometimes it doesn't. A statistical count of all the available relevant language data might or might not allow us to conclude that non-conformity to Principle (55) was the marked situation; this remains an empirical issue. We are, however, obliged to conclude that since a syllable-based definition for morphological classes cannot be consistently applied, some form of Skeletal Tier is still necessary.

2. Analyses of the Amharic, Chaha, and Tigrinya Cases

In the remainder of the paper I present analyses of the cases in 1.1-1.3 and consider further data from Harari which suggests that the analysis presented in the preceding section is not the entire story.

In the approach we have just reviewed, full prosodic structure is assumed to be present at an underlying level, with the result that an entity such as the Skeletal Tier turns out to be entirely derivative and, in consequence, redundant. The wholly opposite view would, of course, be to start with the Skeletal Tier and, after proper association of consonantal and vocalic melodies, derive prosodic structure by means of redundancy rules. However, given an Autosegmental approach to non-concatenative morphology such as McCarthy's, it does not seem possible that prosodic structure could be made entirely redundant.[15] The differential association of consonantal and vocalic

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the phonemes of Harari, but he does not set one up for the 1s prefix, nor, indeed, for any otherwise vowel-initial situations in words. I leave the matter open here since our concern for the moment is with word-final vowels.

[15]It is presumed, however, that prosodic structure could be erected en-

melodies will require the presence of some differentiating mechanism in the
Skeletal Tier. McCarthy's V and C elements, which serve to anchor the vocal-
ic and consonantal melodies, are, by definition, [+syllabic] and [-syllabic]
respectively. Such an intrinsic distinction also provides the information
required for an algorithm of syllabification. But, as the various examples
discussed in Part I will have made clear, there is no guarantee that syllabi-
fication will be complete until the entire surface word is derived.

The arguments levelled against a CV skeleton of the type proposed by Mc-
Carthy (see Levins [1983:12ff.], Archangeli [1984:183-185]), seem to the
present writer to be quite compelling. The main point of the argument is
that [syllabic] is not really a distinctive feature in the way that, say
[coronal] or [low] are, and that "syllable-headedness", i.e. syllabicity, is
expressed by means of the prosodic structure itself. Thus, it is claimed
that a skeletal tier in which syllable heads are distinguished will provide
just enough information for the association of vocalic and consonantal melo-
dies, and will, at the same time, constitute an embryonic prosodic structure.
Accordingly, CV-based morphological templates[16] such as, for example, that of
(37a), which defines the Jussive stem for Amharic quadriliteral verbs, will
be replaced by a partially syllabified template such as that of (37b).

(37) a. CVCCVC   b. X̓X̓XXXX

In fact, I would maintain that entities with such a limited vocabulary
are not always adequate for the association of autosegmental melodies and
that certain cases call for an enrichment of the representation [Hayward, in
preparation]. It is marginally necessary to enter into this here because a
discussion of the Tigrinya data confronts us with gemination. Let it suffice
here simply to observe that geminate consonants are represented as two (non-
syllable head) skeletal slots linked to one element of the consonantal melody.

---

tirely by redundancy rules in languages not operating with distinct consonan-
tal and vocalic melodies: cf. remarks by Levins [1983:22].

[16]Since it is being argued here that prosodic structure may be incomplete
at the levels where morphological structure is assembled, it seems preferable
to speak of "morphological" rather than "prosodic" templates, which was McCar-
thy's original term.

However, rather than achieving this configuration by means of spreading
(which presents certain technical difficulties), the two skeletal slots are
prelinked to a single "receptor matrix". This is symbolized as in (38).[17]

(38)   X   X
        \ /
        [   ]
         |
        [F]
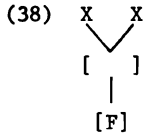
Properly associated representations for the Perfect stem of an Amharic quadri-
lateral such as g-l-b-t' 'overturn' would appear as in (39).

(39)   <u>Perfect stem</u> (gälábbät'-)
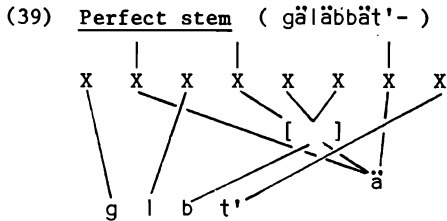
The arguments for this mode of representing gemination are too detailed to
rehearse here. They appear in full in the paper referred to above.

   We return now to an account of the Amharic data presented earlier.

2.1.   <u>Case I: The Amharic Jussive (Type A) Stem</u>. In an earlier paper [Hay-
ward 1986] I discuss a number of issues concerning Amharic syllable structure,
but for the present purpose it is only necessary to note that there are no
complex onsets in the language. This point, however, needs some clarifica-
tion since there are many instances of word-initial (and hence syllable-ini-
tial) consonant + w sequences, e.g.

(40)   [k͡w]as   'ball'
       [g͡w]äddälä   'it got less'
       [b͡w]am[b͡w]a   'pipe'
       [t'͡w]at   'morning'

----

[17]Cf. also Smith's [1985] proposals vis à vis the representation of in-
variant gemination.

[m͡w]äräd   'file'

However, these are analysed as complex segments, rather than as complex (or branching) onsets, i.e. as (41) rather than as (42) or (43).

(41)   (42)   (43)
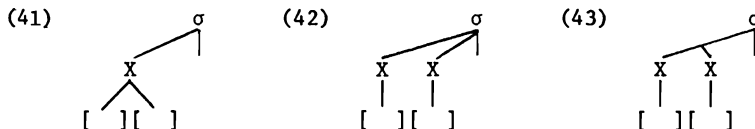
It is of interest that the capacity to express such a distinction formally is by no means unimportant. Differential behaviour is predicted by such structural distinctions.[18] Thus, we might well expect the leftmost elements of the structure depicted in (42) or (43) to be capable of resyllabification (as a coda) word-internally, whereas we should not expect it for (41). With the exception of consonant + w all types of consonant sequences in Amharic may be split by epenthetic processes and so require resyllabification [Hayward 1986:316-317]. This behaviour supports the analysis of such phonetic complexes according to the configuration of (41). It is not immediately obvious how the complex segment vs. complex/branching onset distinction would be expressed within a theory operating without a skeletal tier.

Although Amharic syllable structure does permit syllables with certain types of multiply-branching rhymes, no syllable of this type is permitted other than in word-final position. Onset-less syllables are also permitted, but are restricted to word-initial position. These distributional constraints can be expressed by means of Negative Word Structure Conditions such as the following[19] (cf. Clements and Keyser's [1983:29] Negative Syllable

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[18]It is clear that the configurations of (42) and (43) also present different structures, and if both are not available, which of the two best represents the nature of pre-rhyme complexity is an important theoretical issue. This is not taken up here.

[19]Idiosyncrasies of syllable distribution both here in Amharic and in Chaha (see (65)) are handled as word-structure properties. I have preferred this approach to one invoking considerations of extrametricality. Many languages appear to furnish phenomena requiring the recognition of the word as a domain exercising distinct phonotactic constraints. I suggest that such con-

Structure Constraints):

(44) *
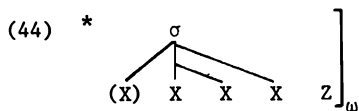
     (Z represents any permitted structure but may not be null.)

(That is, syllables with multiply-branching   rhymes may not occur non-final-ly.)

(45) *
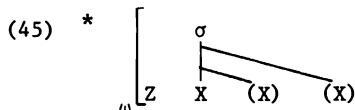
     (Z represents any permitted structure but may not be null.)

(That is, onset-less syllables may not occur non-initially.)

    I assume a maximally general algorithm for syllabification such as (46).

(46) <u>Syllabification</u>
     (i)   Co-syllabify all skeletal slots to the left of a syllable head,
         subject to the (language-specific) constraints governing (a) on-
         sets and (b) word structure.
     (ii) Co-syllabify all skeletal slots to the right of a syllable head,
         subject to the (language-specific) constraints governing (a) co-
         das and (b) word structure.

    As far as prosodic structure is concerned, morphological templates dis-tinguish only those syllable heads that define the morphological class. Syl-labification operates at all levels in the morphology (after the association of consonantal and vocalic melodies has taken place) as well as post-lexical-ly. Unsyllabified elements (marked with a tick) are accomodated by the cre-ation of syllable heads, i.e. by epenthesis. The epenthetic vowel is $[\dotplus]$, which (following Archangeli [1984:38-64]) can be regarded as the maximally underspecified vowel of the language. Except when its derivation is impinged upon by some phonological rule (such as assimilation), all the distinctive feature values for the epenthetic vowel are supplied by redundancy rules.

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straints govern the distribution of syllable types in the languages discussed here, though there seem to be cases where the distribution of particular seg-ments requires reference to word structure.

The template for the Type A Jussive stem is assumed to be as in (47).

(47)
```
          |
   X   X   X   X
```
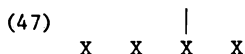
Application of (46) to the underlying forms of the prefix-less second person forms of the paradigm, represented by the 2ms form of (48), fails to accomo-date the initial element.

(48)
```
         /‾‾‾‾|
   X'  X   X   X                    'dance!' (2ms)
   |   |   |   |
   z   f   ä   n
```

Creation of a syllable head after the unsyllabified element renders the lat-ter syllabifiable as an onset, viz.

(49)
```
    /‾‾|      /‾‾|
   X   X   X   X   X
   |   |   |   |   |
   z  [ ]  f   ä   n
```
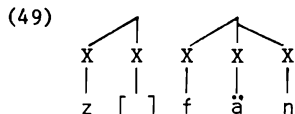
The prefixes of the remaining forms of the paradigm are single consonants underlyingly, with the result that there are two unsyllabified elements, viz.

(50)
```
            /‾‾‾‾|
   X'  X'  X   X   X            'let him dance!' (3ms)
   |   |   |   |   |
   y   z   f   ä   n
```
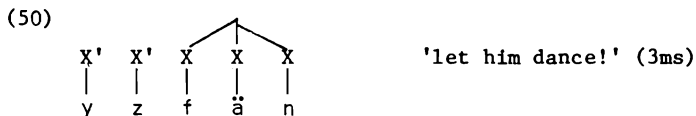
A single syllable head created after the leftmost element renders both of them syllabifiable, viz.

(51)
```
    /‾‾|      /‾‾|
   X   X   X   X   X   X
   |   |   |   |   |   |
   y  [ ]  z   f   ä   n
```
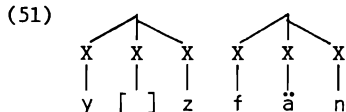
Since most occurrences of ɨ , which is a very common vowel in Amharic, are of an epenthetic nature, it is instructive to examine the rule(s) in-volved. In my earlier account it seemed necessary to distinguish as many as five distinct rules. Subsequent consideration, however, has made it appear

possible to reduce this number.[20] One matter that originally appeared to
present a complication was gemination. Allowing syllabification to apply at
all points in the derivation makes a rule such as (52) (operating progres-
sively from left to right) perfectly adequate for items such as those in
(53):

(52)
$$\emptyset \rightarrow \overset{|}{\underset{[\ ]}{X}} \ / \ X' - X$$

(That is, a syllable head is created after an unsyllabified skeletal slot.)

(53)   z[ɨ]fän   'dance'

        y[ɨ]zfän   'let him dance!'

        s[ɨ]nt   'how many/much?'

        ayzäfn[ɨ]m(m)   'he is not dancing'

        t[ɨ]nn[ɨ]š   'small'

        etc.

---

[20]One type of ɨ-Epenthesis, described in Hayward [1986:317], Rule (39),
remains intractable as far as unification is concerned. It is a rule that
inserts ɨ in front of words beginning with r , creating surface words such
as ɨrob 'Wednesday', ɨrguz 'pregnant', ɨrk'ät 'distance', etc. It might
appear that this rule could be accommodated if we were to propose a Negative
Word Structure Condition prohibiting syllables with r as their onset conso-
nant in word-initial position. However, the rule is optional for some lexi-
cal items, but obligatory for others. This is quite unlike the operation of
of other ɨ-Epenthesis rules, which are exceptionless. Furthermore, the pre-
r ɨ-Epenthesis rule operates as an alternative to the regular ɨ-Epenthesis
in words such as ɨrgɨb ∿ rɨgɨb 'pigeon'. Pre-r ɨ-Epenthesis might be ana-
lysed as a late lexical rule. This would explain the obligatory nature of
its operation in some items only. In cases such as the word for 'pigeon'
above, where the rule could optionally apply but happens not to (Case 2 be-
low), we find that regular ɨ-Epenthesis applies post-lexically, viz.

	Case 1	Case 2
Underlying Representation	r g b	r g b
ɨ-Epenthesis (lexical)	ɨrgb	-----
ɨ-Epenthesis (post-lexical)	ɨrgɨb	rɨgɨb

Consider the derivation of the final item in the list in (53)

(54)   Underlying Representation[21]

```
        X'   X'  X'   X'
        |     \ /     |
        |     [ ]     |
        |      |      |
        t      n      š
```

Epenthesis (Rule 52)

```
        X'   X   X'  X'   X'
        |    |    \ /     |
        |    |    [ ]     |
        |    |     |      |
        t   [ ]    n      š
```

Syllabification (46)

```
        X    X   X    X'   X'
        |    |    \ /       |
        |    |    [ ]       |
        |    |     |        |
        t   [ ]    n        š
```

Epenthesis (Rule 52)

```
        X    X   X    X'   X    X'
        |    |    \ /       |    |
        |    |    [ ]       |    |
        |    |     |        |    |
        t   [ ]    n       [ ]   š
```

Syllabification (46)

```
        X    X   X    X    X    X
        |    |    \ /       \  /
        |    |    [ ]        |
        |    |     |         |
        t   [ ]    n        [ ]   š
```

Surface Form (after the
redundancy rules have sup-
plied features for the
epenthetic vowel)   tɨnnɨš

Rule (52) makes wrong predictions, however, in items such as the follow-
ing.

_____

[21]As used here the term "Underlying Representation" defines a form in
which consonantal and vocalic melodies are already associated with the tem-
plate and the erection of prosodic structure has proceeded as far as possi-
ble. Unsyllabified skeletal slots are marked with a tick.

(55) [ɨ]dd[ɨ]l   (*d[ɨ]d[ɨ]l)   'luck, lot, chance'

      [ɨ]zz[ɨ]h   (*z[ɨ]zh, *z[ɨ]z[ɨ]h) 'here'

      [ɨ]kkʷ[o]l   (*k[ɨ]kʷ[o]l)   'equal'

      t[ɨ]n[ɨ]nn[ɨ]š   (*t[ɨ]nn[ɨ]nš)   'small (intensive, distribu-
      etc.   tive)'

For this reason it was deemed necessary to provide a further rule, such as
(56), which would be sensitive to the geminate configuration [Hayward 1986:
316]:

(56)
$$\emptyset \;\rightarrow\; \overset{\displaystyle |}{\underset{\displaystyle [\;]}{X}} \;/\; \underline{\quad} \; \underset{[\;]}{X'\;\diagdown\!\diagup\;X'}$$

The derivation of the item [ɨ]dd[ɨ]l 'luck, lot, chance' would proceed as
in (57).

(57) Underlying Representation
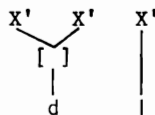
Epenthesis (Rule 56)
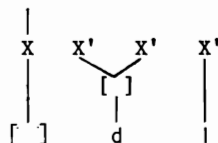
Syllabification (46)
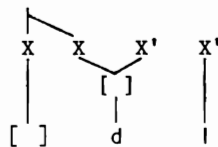
Epenthesis (Rule 52)
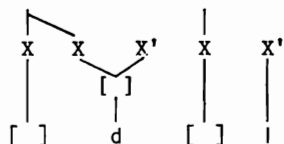
Syllabification (46)
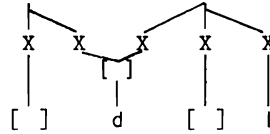
Surface form (after all
redundancy rules have applied)   ɨddɨl

The real question, however, is whether Rule (56) is necessary. Rules
such as (56) are devised in an essentially *ad hoc* way to prevent a general
rule of epenthesis from "splitting" a geminate. But are geminates ever split?
One of the surest universals we have in phonology concerns the "integrity" of
geminates.[22] A constraint, stated tentatively as in (58), must surely be
part of Universal Grammar.

(58) Geminate Integrity Constraint
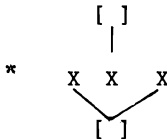
In dealing with the facts of Amharic may we not simply rely upon this univer-
sal constraint to overrule any mis-application of epenthesis rules such as
(52)? Thus, while a grammar containing (56) might achieve a measure of de-
scriptive adequacy, one without it, appealing intrinsically to Universal
Grammar with (58), comes closer to achieving explanatory adequacy.

Rule (59) represents a fully revised rule for ɨ-Epenthesis in Amharic.
(It may be noted that another special rule, which had been set up for dealing
with unsyllabified elements word-finally [Hayward 1986:314-315] is incorporat-
ed here according to the Elsewhere Condition.

(59)
$$\emptyset \rightarrow \overset{|}{\underset{[\ ]}{X}} \ / \ \left\{ \begin{array}{l} \underline{\quad} \ X']_\omega \\ X' \ \underline{\quad} \end{array} \right\} \quad \begin{array}{l} a. \\ \\ b. \end{array}$$

---

[22]Claims to this effect have been made repeatedly ever since the appear-
ance of Kenstowicz and Pyle's classic article in 1973.

(That is, if an unsyllabified skeletal slot occurs word-finally, create a syllable head to its left; otherwise, create a syllable head to its right.)

2.2. Case 2: The Chaha Jussive II Stem.

According to Leslau [1964:53] the historical developement of Jussive II involved the merging of jussive forms with distinct vocalic melodies. This is illustrated here with reconstructed 3ms forms.

(60) *ya-C_1C_2ɨC_3
        *ya-C_1C_2uC_3 → yä-C_1ɨC_2C_3 ~ yä-C_1C_2ɨC_3

For Chaha synchronically, as for Amharic, it seems entirely plausible to claim (for verbs at least) that ɨ has now to be regarded as generated by epenthesis. No doubt neutralisation of the original contrast between the short high vowels in Jussive II forms contributed to this phonological re-structuring. Elimination of ɨ from the inventory of underlying elements in verb forms enables us to re-interpret the phonological history of the Jussive II stem depicted in (60) as in (61).

(61) *ya-C_1C_2ɨC_3
        *ya-C_1C_2uC_3 yä-C_1C_2ɨC_3 → yä-$C_1C_2C_3$

What then are the conditions under which ɨ-Epenthesis in Chaha operates so as to generate the two surface variants? It should be pointed out straightaway that the distribution of the present-day -CCɨC- and -CɨCC- alternants shows no correlation whatsoever with the original distinction in vocalism. That distinction is irrecoverable from internal reconstruction. The modern alternation relates entirely to considerations of syllable structure. A generalized syllable template for Chaha appears to be exactly like what one would propose for Amharic, viz.

(62)   σ
           (X)   X   (X)   (X)

The template permits CV, CVC, CVCC, V, VC, and VCC syllable types. What is of immediate interest concerns the types of consonant clusters that are per-

mitted within the rhyme. Earlier it was observed that the key determinant
for the differential distribution of ɨ in Jussive II forms seemed to be
the relative sonorities of the second and third radicals. To account for
this state of affairs formally requires reference to some scale of sonority.
Of the various suggestions that have been made for evaluating sonority and
for making use of such values in linguistic description, e.g. Hankamer &
Aissen [1974], Hooper [1976], etc., Selkirk's [1984] proposal appears promis-
ing. Selkirk sets up a scale of sonority with numerical indices ranging
from 10 (for the open vowel a) to 0.5 (for the voiceless stops). Selkirk
is careful to say that such indices are a "provisional assignment", but adds
(p. 112):

> "It is not clear whether the absolute integer value of the sonority in-
> dices assigned to each of these segment types is important. I assign ab-
> solute values for expository convenience, though for the moment I will as-
> sume that only the sonority *relations* expressed by the indices are impor-
> tant. Later we will see that in fact a purely relational characteriza-
> tion of the sonority hierarchy is inadequate and that some indication of
> absolute sonority values is needed after all."

Thus, she is fully aware that a successful exploitation of such a sonority
hierarchy by linguists presupposes that definite sonority values for all seg-
ment types will eventually be established. An even more fundamental problem
concerns the definition of sonority itself. Here, I believe that Selkirk
[1984:111-112] is correct in stating that the programme of research that will
provide the basis for such a necessarily phonetic definition will be the ob-
servation of the relative sonority values assigned to various segments in the
phonologies of natural languages. For the present, however, I am only con-
cerned with relative sonority in Chaha, and the hierarchy presented in (63)
facilitates the expression of relevant patterning in rhyme clusters in that
language. It will be observed that the scale starts with an assignment of an
index of 1 to a class of segments that behave as the *least sonorous sounds in
the phonology of Chaha*, an index of 2 is assigned to the next set, and so on.
However, having insisted that the scale is language specific, it will never-
theless be immediately obvious that the classes defined correspond well with

classes defined for similar purposes in the phonologies of other languages.[23]

(63)   obstruents   nasals   liquids   glides

1	2	3	4	5	6	7
f	s	d	β	m	r	w
t̩		g	(z)	n		y
x						
k						
t'						
k'						

Utilizing (63) the following Negative Syllable Structure Condition is proposed for Chaha.

(64)   *   σ

```
         σ
        /|\
       / | \
      X     X
      |     |
  [SI:<n]  [SI: n]
```
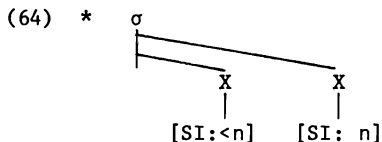
(That is, a rhyme cluster is not permitted in which the sonority index (SI) of the first (leftmost) member is less than that of the second member.)

Chaha shares with Amharic the two Negative Word Structure Conditions given in (44) and (45). The template in (65), which is proposed for the Jussive II stem, terminates in three consonants, i.e. a structure which does not allow an associated representation such as that in (66) for the 3ms of g-f-r 'release' to be fully syllabified.

(65) |
       X   X   X   X

(66)
```
        /|\
       X X X  X'  X'
       | | |  |   |
       y ä g  f   r
```

---
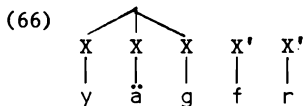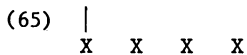
[23]The scale used here is set up then solely with the description of Chaha in mind. Although there is no intention here to attack Selkirk's Sonority Hierarchy, it may be of interest to note that in Chaha voiced and voiceless

The presence of the final consonant ensures that only the g will be co-syllabified with the initial syllable head; leftward co-syllabification of the f , even if (64) did not obtain, would be barred by Word Structure Condition (44).

As far as epenthesis is concerned the issue may be whittled down to the simple question of whether the relative sonorities of C_2 and C_3 are such as to allow them to constitute a rhyme cluster. If they can form such a cluster, i.e. if (64) is not violated, epenthesis will create a syllable head after C_1, but if they cannot, epenthesis creates a syllable head after C_2. A Rule of epenthesis formulated for sensitivity to these conditions is proposed in (67).

(67) ɨ-Epenthesis[24]

$$\emptyset \rightarrow \begin{matrix} X \\ | \\ [\ ] \end{matrix} \Big/ \left\{ \begin{matrix} X \text{———} X' \\ | \quad\quad | \\ [SI:<n] \quad [SI: n] \end{matrix} \right]_\omega \quad\quad \text{———} X'\, X' \end{matrix} \right\} \begin{matrix} \text{a.} \\ \\ \\ \text{b.} \end{matrix}$$

(That is, if an unsyllabified skeletal slot occurs word-finally and it is linked to a segment which has greater sonority than that of the segment linked to the preceding skeletal slot, create a syllable head to its left; otherwise, create a syllable head to the left of two unsyllabified skeletal slots.)[25]

---

fricatives do not pattern in accordance with her proposal [Selkirk 1984:112].

[24]The leftmost X slot in the more specific environment of the rule is not marked as unsyllabified. This is because the same process applies in word-final sequences even when the string consists of only two consonants. In other words, it does not matter whether the penultimate consonant is unsyllabified or not.

[25]One point to note is that rule (67) for Chaha makes final consonant clusters in Jussive forms the unmarked member of the pair of stem alternants, whereas if we follow Leslau, we must assume that their historical antecedent was uniformly of the shape *VCCVC. This evidence of reversal of the dominant pattern provides strong support for the interpretation advanced here to the effect that restructuring of the vowel system simply eliminated ɨ phonologically.

The operation of this rule is illustrated in the derivations of the 3ms
forms yäfk'ɨd 'let him permit!' and yäk'ɨms 'let him taste!'.

(68) Underlying
      Representations

```
              /\                        /\
      X   X   X   X'  X'          X   X   X   X'  X'
      |   |   |   |   |           |   |   |   |   |
      y   ä   f   k'  d           y   ä   k'  m   s
```

      Epenthesis (67)

```
                |                          |
      /\                         /\
      X   X   X   X'  X   X'      X   X   X   X   X'  X'
      |   |   |   |   |   |       |   |   |   |   |   |
      y   ä   f   k' [ ] d        y   ä   k' [ ] m   s
```

      Syllabification

```
      /\      /\                /\      /\
      X   X   X   X   X   X      X   X   X   X   X   X
      |   |   |   |   |   |      |   |   |   |   |   |
      y   ä   f   k' [ ] d       y   ä   k' [ ] m   s
```

      Surface Forms
      (after redundancy
      rules have supplied
      features for the
      epenthetic vowels)   yäfk'ɨd   yäk'ɨms
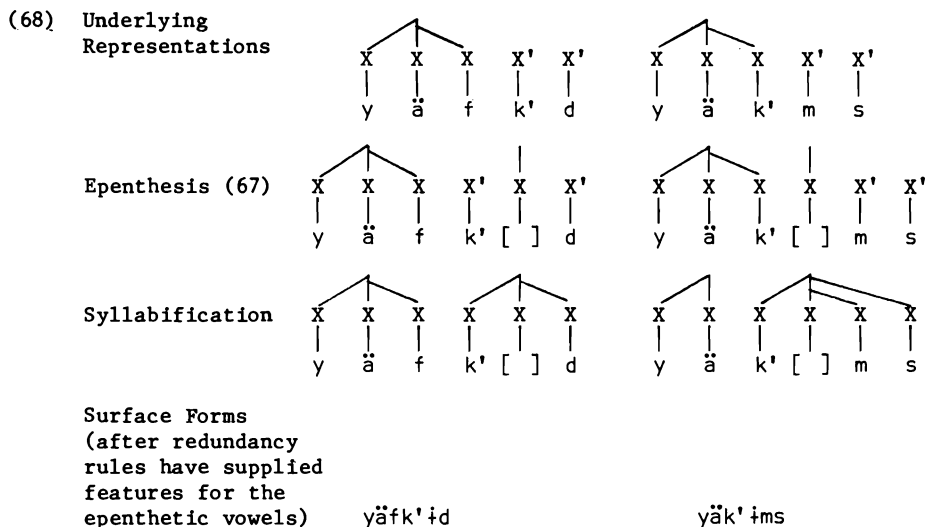
In Hayward [1986:314-315] some cases of epenthesis in Amharic were also
described for word-final clusters. But Amharic does not employ the delicate
selection mechanism of Chaha, where obstruents need several subdivisions. A
gross distinction between obstruents and non-obstruents, i.e. "sonorants", is
all that is required. Since both languages allow syllables with multiply-
branched rhymes in word-final position, the difference between them
reduces to one of Syllable Structure Conditions. The Amharic counterpart of
the Chaha Negative Syllable Structure Condition in (64) is (69a), which could
also be expressed as in (69b).

(69) a.   * σ   b.   * σ
```
          /‾‾‾‾‾‾\                     /‾‾‾‾‾‾\
          |       \                    |       \
          X        X                   X        X
          |        |                   |        |
      [SI: ≤4]  [SI: ≥5]           [+obstr]  [-obstr]
```
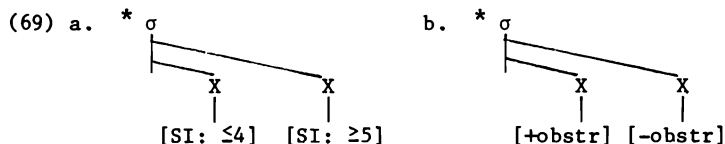
2.3. Case 3: The Tigrinya Imperfect. For three of the Ethiopian Semitic
languages considered in this paper epenthesis rules that insert a high cen-
tral vowel ɨ have been postulated. In the fourth case (Harari) the epen-

thesis involved the high front vowel ´i .[26] Furthermore, it has been claimed
that every one of these rules is motivated by considerations of syllabifica-
tion. The analysis sketched out in section 1 for the stem in the Imperfect
of Type A verbs in Tigrinya raises an important question concerning the stage
in the morphology/phonology at which ɨ-Epenthesis takes place because an
alternative to ɨ-Epenthesis is available for Tigrinya in the shape of a rule
of Degemination. Since both rules "conspire" towards the same end, i.e. the
complete syllabification of the surface word, it is necessary to determine
the precise conditions under which each rule operates. The template hypothe-
sized for the stem in question is shown in (70):

(70)

X   X   X   X   X
[ ]
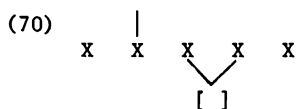
Seen from the point of view of phonology *per se* there is no obvious reason
why suffixation of the vowel-initial suffixes in 2fs, etc. (see (30)) should
trigger Degemination; ɨ-Epenthesis would have been just as effective in ren-
dering these forms syllabifiable, as can be seen by a consideration of the
2fs form. (In the derivation in (71) an ɨ-Epenthesis rule is assumed to op-
erate very much as in Amharic, and, as far as the verb forms under discussion
are concerned, this assumption seems to be a reasonable one.)

(71)   Underlying Representation

X' X   X   X   X' X   X
                [ ]
t   s   ä   b   r   i
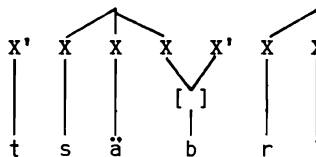
Epenthesis (two
applications)

X' X   X   X   X   X' X   X   X
                    [ ]
t   [ ] s   ä   b   [ ] r   i

---
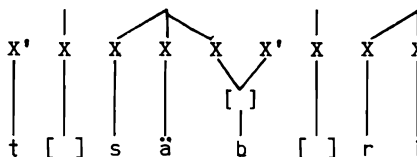
[26]Even in Harari this vowel is often centralized in its pronunciation.

Syllabification (46)

```
          /|    /|\   \|/  /|   /|
          X X   X X   X X X X  X X
          |  |   |  |   \V/   |  |   |  |
          |  |   |  |   [ ]   |  |   |  |
          |  |   |  |    |    |  |   |  |
          t [ ] s  ä    b   [ ] r  i
```
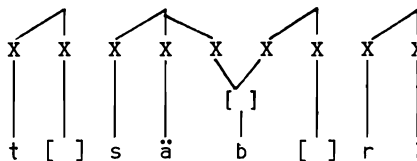
Eventual surface form   tɨsäbbɨri

In fact, tɨsäbbɨri is incorrect, but there is nothing ill-formed about the word phonologically. The 2fs form of the Jussive of a Type B word such as ɨ-s'-m 'finish (tr.)' in Tigrinya presents just such a surface structure, viz. (ʔay)tɨɨäs's'ɨmi . The non-occurrence of such a form as *tɨsäbbɨri must be attributed in part to morphological factors.[27] The conjunction of the vocalic suffixes (found in 2fs, 2mp, 2fp, 3mp, 3fp) together with [imperfect] and [Type A] defines the conditions under which Degemination takes place. Together with the appropriate suffixes the degeminated alternant offers no obstacle to a satisfactory syllabification. (It will be noted, however, that ɨ-Epenthesis will still be required to handle the junctural clusters of prefix and stem.) The remaining forms, in which the full set of requisite morphological features do not co-occur, do not undergo Degemination, though subsequently they all undergo ɨ-Epenthesis.

Given the model of Lexical Phonology, this sort of behaviour can be ac-

---

"...the Harari vowel i is often interchanged with ə [= ɨ as employed here—RJH] in Harari itself and corresponds to the vowel ə [= ɨ RJH] of the other Ethiopic languages." [Leslau 1958:4]

[27]Kenstowicz [1982:110] also clearly regards the stem shape alternation in the Tigrinya Type A Imperfect as morphological, though he does not suggest that it is in any way motivated by concerns of syllable structure. I assume Degemination to be something like the following. (The rule is illustrated with 2fs tɨsäbri 'you(f) broke (sthg)'.

```
          /|   /|\    \
          X  X  X  X  X' X  X
          |  |  |   \V/   |  |
          |  |  |   [ ]   |  |
          |  |  |    |    |  |
          t  s  ä   b   r  i
```
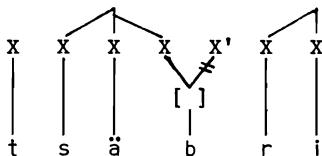
commodated without difficulty.[28] Tigrinya Degemination is clearly a rule
constrained to apply only at a particular lexical level, in this case the
level at which inflectional suffixes are introduced. For Tigrinya, as indeed
for all the languages discussed here, ɨ-Epenthesis has to be seen as a post-
lexical rule, i.e. a truly exceptionaless phonological rule triggered by
purely phonological determinants.

The same model explains very well the problem in Harari discussed by Ken-
stowicz and Kisseberth [1979:233-235]. Examination of the Type A Imperfect
of Harari (given above in (35)) shows that the final i of the 2fs form is
hypothesized as an underlying vowel. (It is, in fact, cognate with the 2fs
-i suffix of Tigrinya, which we have just considered.) For many verbs 2fs
and 3fs forms are identical, though in the latter, final i is claimed to be
epenthetic. However, in triliteral verbs in which C_3 is a coronal, palatali-
zation occurs in 2fs forms, but not in 3fs forms, e.g.

(72)   2fs Imperfect   3fs Imperfect
       tič'ämk'i   tič'ämk'i   <   č'-m-k'   'squeeze'
       tilämǰi   tilämdi   <   l-m-d   'learn'
       tiläbši   tiläbsi   <   l-b-s   'dress'
       tinädyi   tinädli   <   n-d-l   'make a hole'

Moreover, as Leslau [1958:18] observes:

> "The palatalization can also affect the 1st or 2nd radical of the root if
> it is a dental, liquid or sibilant. Thus, tišäbri , from sbr 'break';
> tikäčbi , from ktb 'write'; tič'älfi , from t'lf 'rob'; ..."

Very clearly palatalization, occasioned by suffixation of the 2fs inflec-
tion, is a rule restricted to a specific lexical level—probably the same lev-
el as that at which Degemination takes place in Tigrinya.

It will be recalled that the discussion of the Harari Type A Imperfect in
Part I conceded that the phonology of the language provide support for the
putative "Principle (55)". I should like finally to look at a further aspect

---

[28]For a good overview of the model the reader is referred to Kaisse and
Shaw [1985].

of Harari verb morphology that suggests that Harari too is at heart a non-
conformist with respect to the said principle.

A side-by-side inspection of the Jussive and Imperative forms for Type A
verbs in Harari, as in (73), would seem to suggest that postulation of a sin-
gle paradigm as argued for Amharic (see the case in section 1.1) would be
fraught with difficulties.

(73)   <u>Jussive</u>   <u>Imperative</u>

    1s   näč'mäk'

    2ms   č'Imäk'

    2fs   č'imäk'ľ

    3ms   yäč'mäk'

    3fs   täč'mäk'

    1p   näč'mäk'

    2p   č'imäk'u

    3p   yäč'mäk'u

In fact Leslau [1958:25-26] does make precisely this claim.ᵥ He achieves this
by analyzing the prethematic ä (in the non-Imperative forms) as part of the
prefix, rather than as part of the stem, i.e. as 1s nä-č'mäk' , 3ms,
yä-č'mäk' , 3fs tä-č'mäk' , etc. This enables him to set up the common can-
onical form $-C_1(i)C_2äC_3-$ for the Jussive/Imperative of Type A triliteral
verbs. The longer stem alternant č'Imäk'- , found in Imperative forms,[29] can
well be accounted for by epenthesis.[30] If this is the case, then we have a
further instance of a consonant in a morphological class behaving at certain
times as a coda and at others as an onset, viz.

(74) a.   a.
   y ä č' m ä k'   č' i m ä k'

---

[29]It is also found throughout the negative.

[30]Leslau does not actually say this, but his representation of the i in
parenthesis, plus his explicit recognition of final i as "euphonic" in
forms with consonant clusters stem-finally, suggests a tacit recognition of
the status of this vowel.

The crux of Leslau's analysis is the analysis of ä̈ with the prefixes. But is this either desirable or necessary? I believe it is undesirable since it obliges us to posit morphologically determined allomorphy for these prefixes, i.e. yä̈- , tä̈- , etc. with the affirmative Jussive stem, but y- , t- , etc. elsewhere.

Moreover, reflection on the principled behaviour of vocalic elements in the verb systems of Ethiopian Semitic languages in general makes it possible to suggest an alternative. It has been claimed [Taddese Beyene, forthcoming] that underlyingly the Amharic verb system employs just one vowel, namely, the mid central vowel ä̈ . The significance of this insight, when viewed from the vantage point of a model of phonology utilizing Autosegmental and Underspecification theories is developed in Hayward and Watson [in preparation]. Furthermore, the insight carries over to many aspects of verb morphology in other Semitic languages of Ethiopia. This is not the place to enter into a discussion of how fully Taddese Beyene's claim can be substantiated, but in our forthcoming paper we demonstrate that at *all lexical levels* the monovocalic melody,[31] which in the default case comes to be realised as ä̈ , is associated with any skeletal slot functioning as a syllable head. Moreover, as exemplified by comparison of the Perfect and Imperfect 3ms imperfect forms of the Type A Passive stem in Harari, ä̈ can be associated with a skeletal slot preceding that associated with the first consonant radical.

(75) a. <u>Perfect</u> tä̈k'ä̈bä̈ra   b. <u>Imperfect</u> yitk'ä̈bä̈r
        'he was buried'   'he will be buried'

[31]In accordance with the insights of Underspecification Theory, this vowel could be distinguished simply as [-high], though see Hayward and Watson [in preparation].

There is some evidence which can be used to argue that ä̇ may spread to skel-
etal slots altogether outside the template itself. In Harari, for example,
all the object pronoun suffixes (except the 3fs form) have alternants with
ä̇ . These alternants occur with those verb forms which do not have a final
vowel inflection, viz.

(76)   3ms subject   3p subject
       yigädI -ä̇x 'he kills you(m.)'   yIgädIu-x 'they kill you(m.)'
       yigädI -ä̇ň 'he kills me'   yIgädIu-ň 'they kill me'
       yägdäI -ä̇š 'may he kill   yägdäIu-š 'may they kill you(f.)!'
                    you(f.)!'

If we assumed that these object suffixes are underlyingly consonant-initial,
the occurrence of the ä̇ could be seen as comparable to that of the epenthet-
ic (post-lexical) ɨ for Harari, i.e. as supplying prosodic structure. In
such a case we would have a morphologically determined creation of a syllable
head.[32] Here, however, phonic substance might become associated with the new
slot by assimilation, as in the derivation in (77) of yigädIä̇ň 'he kills
me'.

(77)   Underlying Representation

                                    X'   X   X   X   X' X'
                                    | | | | | |
                                    y   g   ä̇   d   I   ň

---

[32]The argument might appear to be weakened by the fact that ä̇ appears
(with the same distribution) together with the plural forms, e.g.

   Imperfect (3ms subject)   Jussive (3ms subject)
   yigädI -ä̇na 'he kills us'   yägdäI -ä̇na 'may he kill us!'
   yigädI -ä̇xu 'he kills you(p)   yägdäI -ä̇xu 'may he kill you(p)!'
   yigädI -ä̇yu 'he kills them'   yägdäI -ä̇yu 'may he kill them!'

Consideration of the Jussive forms shows that no violation of syllable struc-
ture would occur if ä̇ were not present. We have probably to reckon with
analogical levelling to explain these plural forms. But it has to be recalled
that we are considering patterns that should be regarded as lexicalized from a
synchronic point of view, i.e. forms where fully phonological explanations
are no longer possible.

Epenthesis (Lexical) and
  assimilation

```
          X'  X   X   X   X'  X    X'
          |   |   |            |    |
          y   g   ä   d   l    ñ
```

Syllabification (46)

```
          X'  X   X   X   X   X   X
          |   |   |   |   |   |   |
          y   g   ä   d   l   ä   ñ
```

Epenthesis (post-Lexical)

```
      X'  X   X   X   X   X   X   X
      |   |   |   |   |   |   |   |
      y   [ ] g   ä   d   l   ä   ñ
```

Syllabification (46)

```
      X   X   X   X   X   X   X   X
      |   |   |   |   |   |   |   |
      y   [ ] g   ä   d   l   ä   ñ
```

Surface Form   yigädläñ

The view that the vocalic melody may extend its influence beyond its primary
and proper domain, i.e. the stem, is in some ways reminiscent of vowel harmo-
ny.

Returning to the Harari Type A Jussive it is now possible to suggest
that the prethematic ä in näč'mäk' , etc. results from just such a lexical
attempt to resolve an unsyllabifiable string, as was outlined for the object
suffixes. The morphological restrictions on this process are comparable to
those governing the rule of Degemination in Tigrinya, for example. Both pro-
cesses have to be sharply distinguished from fully pervasive post-lexical
processes such as ɨ-Epenthesis.

3. Conclusion

In Section 2 of this paper I have proposed a series of analyses for morpho-
logical alternations found in several African Semitic languages. In every
case the analysis has depended heavily upon a particular theoretical con-
struct, namely, the Skeletal Tier. The analyses would not have been possible
without this entity. The analyses themselves then furnish evidence for the
value of the Skeletal Tier, and so complement the arguments adduced in Sec-
tion 1, which attempted to demonstrate that a recent proposal to define morpho-
logical templates in strictly prosodic (syllable-based) terms was untenable.

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DISTINCTIVE NASALITY IN KWAWU:
A PROSODIC ACCOUNT

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Nasality in Kwawu is distinctive in vowels but predictable
in consonants. This uncommon distribution is interpreted
here in prosodic terms. It is claimed that the feature
[+nasal] is represented on morae rather than on individual
segments. The assignment of the feature [+nasal] is inte-
grated with syllabification rules, which explains the pro-
sodic characteristics of nasality. Further evidence is
drawn from the distribution of nasality in reduplicated
forms; the moraic representation of the feature [+nasal]
is crucial for the analysis of reduplicated CV stems.

0. Introduction

Kwawu, spoken in the Eastern Region of Ghana, is a dialect of Akan, a

member of the Kwa sub-branch of the Niger-Congo Family.[1] This article is

concerned with nasality in Kwawu, in particular the correlation between the

syllable structure and the distinctive distribution of the feature [nasal]

(where distinctive distribution refers to representations prior to local as-

similation rules). Like in other dialects of Akan (see Schachter and Fromkin

[1968] and Dolphyne [1987]), nasality in Kwawu is distinctive in vowels only,

while predictable in consonants. I will argue that this uncommon distribu-

tion of nasality can be best accounted for in prosodic terms, and suggest

that the feature [+nasal] is underlyingly represented on the mora, from

where it percolates to the segments dominated by this mora, while [-nasal]

is assigned by default. The direct relation between the syllable structure

---

and nasality is demonstrated by the incorporation of the assignment of nasal-
ity with syllabification rules.

    Further evidence for this proposal is given by the distribution of nasal-
ity in reduplicated forms. Reduplication in Kwawu is roughly a stem copy,
with some modification of the copied vowel in monosyllabic stems. Deviation
from this generalization is exhibited by Cã stems, where C is oral; in
this case the feature [+nasal] is not copied. I will argue on independent
grounds that in Kwawu a is underspecified, thus represented by an empty
root node, and assume that [+nasal] cannot percolate to an empty node. Re-
duplication, which does not copy the moraic tier, applies before the empty
node is specified and thus before the feature [+nasal] is licenced to perco-
late. Therefore, the copied segmental material does not include the feature
[+nasal].

    The article is organized as follows. In section 1 I present the syllable
structure in Kwawu, with particular emphasis on CVN syllables (where N stands
for a nasal consonant), whose structure is ambiguous amongst languages. I
then propose a set of syllabification rules which derive all permissible syl-
lables. In section 2 I examine the distinctive distribution of nasality, and
point out the disadvantages of a linear analysis which assumes that the pho-
nemic inventory of the language consists of oral vowels, nasal vowels, and
oral (but not nasal) consonants. I will then offer a representation in which
the feature [+nasal] is underlyingly specified on the mora. The benefit of
this representation is reflected by the direct relation between the syllable
structure and the distinctive distribution of nasality. I will show that
the distinctive distribution of nasality can be properly incorporated into
syllabification rules, which explains its prosodic characteristics. Further
evidence for this proposal is given in section 3 where the behaviour of the
feature [+nasal] in reduplicated forms is perused. I will show that the pe-
culiar behaviour of nasality in reduplicated forms can be best accounted for
under the assumption that [+nasal] is represented on the mora.

1. The Syllable Structure

    The syllable structure in Kwawu is a crucial factor in the analysis of
the distinctive distribution of nasality proposed here. In section 1.1 I
outline the theoretical concepts relevant to my discussion, pointing out the

advantages of the moraic theory for the present analysis (the reader is re-
ferred to the references mentioned there for more comprehensive exposition).
In section 1.2 I examine the syllable structure in Kwawu, in particular the
structure of CVN syllables, which are known to be ambiguous with respect to
their moraic structure. I then propose a set of syllabification rules which
derive all possible syllable structures.

1.1. <u>Theoretical background</u>. Considerable attention has been given in re-
cent work to the study of the syllable structure, where two fundamentally
different structures have been proposed to account for various syllable-sen-
sitive phenomena: the more traditional onset-rhyme structure (see Clements
and Keyser [1983] for discussion and references) and the moraic structure
(Hyman [1985], McCarthy and Prince [1986], and Hayes [1988]). Both views
crucially distinguish between light and heavy syllables, as this contrast
has been found to play a major role in phonological processes.

(1) a. The onset-rhyme structure

Light   Heavy
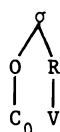
$$\begin{array}{ccc}
\sigma & \sigma & \sigma \\
O\quad R & O\quad R & O\quad R \\
|\quad | & |\quad \wedge & |\quad \wedge \\
C_0\ V & C_0\ V\ V & C_0\ V\ C
\end{array}$$

σ = syllable
O = onset
R = rhyme
V = vowel
C = consonant

b. The moraic structure

Light   Heavy
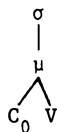
$$\begin{array}{cccc}
\sigma & \sigma & \sigma & \sigma \\
| & | & \mu\ \ \mu & \mu\ \ \mu \\
\mu & \mu & & \\
C_0\ V & C_0\ V\ C & C_0\ V\ V & C_0\ V\ C
\end{array}$$
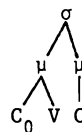
μ = mora

In the onset-rhyme structure a heavy syllable is characterized by complex
rhyme, while in the moraic structure a heavy syllable is characterized by
two morae. The distinction between the two types of structure relevant to
the present discussion rests on the constituent elements in a heavy C_1VC_2
syllable. In the onset-rhyme structure V and C_2 form a constituent
($[C_1[VC_2]]$), while in the moraic structure C_1 and V form a constitutent

($[[C_1V]C_2]$). Nasality in Kwawu provides   strong evidence for the moraic
syllable structure, since C_1 and V must agree in nasality, while V and C_2
must not. Only in the moraic structure are C_2 and V exclusively dominated by
a mora, and as will be argued later on, the mora is the domain of nasality.[2]

The moraic structure, unlike the onset-rhyme structure, reflects the
cross-linguistic distinction between heavy and light CVC syllables. As ar-
gued in Hayes [1988], some aspects of the syllable structure are language-
specific. In languages whose phonology does not manipulate any weight dis-
tinction or treat CVC and CV syllables alike (as opposed to CVV syllables, if
any), a CVC syllable is monomoraic. Alternatively, in languages which pro-
vide evidence for weight distinction or treat CVV and CVC syllables alike (as
opposed to CV syllables), a CVC syllable is bimoraic. A different type of
evidence is given here to show that in Kwawu a CVC syllable is bimoraic, but
due to dialect interaction some CVC syllables are interpreted as monomoraic
for the purpose of one process only.

A somewhat different syllable structure is assumed in McCarthy and Prince
[1986] and Hayes [1988], where it is suggested that the prevocalic consonant is
not linked to the mora of the first vowel as in (2a), but rather directly to
the syllable node, as in (2b):

(2) a.   σ   b.   σ
            | /\
            μ   / μ
           /| / |
          C V   C   V
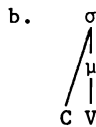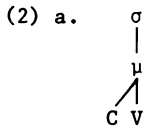
The structure in (2b) is found unsuitable for Kwawu, since the prevocalic
consonant and the vowel must form a constituent for the purpose of nasality,
therefore both should be dominated by the same mora. I presume that struc-
tures (2a) and (2b) are chosen on language-specific grounds, as is the
case with postvocalic consonants mentioned earlier, i.e. that in the CVC syl-
lable the final C can be linked to the mora of the vowel, or to an indepen-
dent mora.

---

[2]See Hayes [1988] for a discussion presenting arguments for the advan-
tages of the moraic structure.

The moraic theory neatly accounts for the distinction between short and long vowels and diphthongs. Short vowels and diphthongs are linked to one mora, while long vowels and diphthongs are linked to two morae.

(3)   short   long

    vowel   diphthong   vowel   diphthong

$$\begin{array}{cccc} \mu & \mu & \mu\;\mu & \mu\;\;\;\mu \\ | & \diagdown & \diagdown\diagup & |\;\;\;| \\ V & V_1\,V_2 & V & V_1\,V_2 \end{array}$$
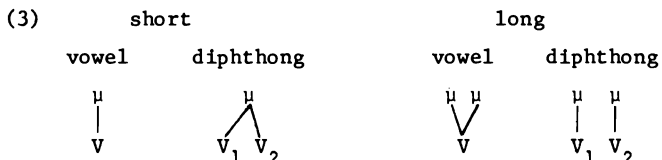
The syllable structure is derived by universal rules subject to language specific constraints. The first rule, as proposed in Hyman [1985], is the Onset Creation rule, which links a consonant to the mora of the following vowel. Hyman assumes that each segment is underlyingly linked to a mora. Therefore, the mora of the prevocalic consonant is deleted. Hayes [1988] raises the problems posited by the assumption that all segments are underlyingly linked to a mora. This representation does not distinguish between high vowels and their corresponding glides. Since high vowels tend to alternate with glides, it has been assumed that glides and vowels have the same melodic features. But if both are underlyingly linked to morae there is no way to distinguish between u and w or i and y .   Therefore Hayes suggests, following Guerssel [1986], that only vowels are lexically linked to morae, while consonants are free.

(4) high vowels   glides

$$\begin{array}{cc} \mu & \mu \\ | & | \\ i & u \end{array} \qquad\qquad\qquad i \qquad u$$

The assumption that vowels are underlyingly linked to morae is crucial to the analysis proposed here, since the mora must be given underlyingly in order to host the feature [+nasal].

Assuming that vowels are underlyingly linked to morae we must then abandon the claim that underlying representations are subject to the Obligatory Contour Principle (OCP), which prohibits identical adjacent (auto) segments. As shown in Janeway [1987], Luganda permits sequences of glides and high vowels, as in kuwummula 'rest' and kusiiyiika 'scorch'. Three possible

structures can be assumed for these forms, but only one seems appropriate:

(a)   If we assume that onsets are linked to the syllable node and that the OCP is in force, the resulting representation (5a) is rather odd.   As noted by Janeway [1987:28],

> "The oddness of this representation is no argument against it, but it does have implications.   First, prosodic well-formedness conditions must be revised to allow ambisyllabic vocalic melodies...   Second, this predicts that in a language which has such forms, and also some rule that alters the featural specification of vowels (e.g.   i → e / __k), then the entire melody will undergo this rule."

(b)   If we assume that a prevocalic consonant is linked to the mora and the OCP is in force (5b), the underlying representation, would not reflect the correct surface form.

(c)   Therefore it is assumed that the prevocalic consonant is linked to the mora and that the OCP is not in force (5c).

(5) a.

b.

→   *kusiilika

c.
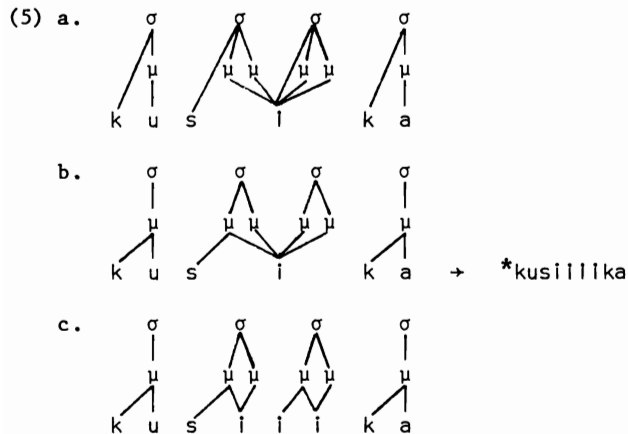
As shown in Odden [1986] OCP violation is not a rare phenomenon, therefore the structure in (5c) is not far-fetched.

The structure of the syllable is mainly rule driven, where partial underlying prosodic structure is often required.   The resulting representations consist of three tiers: the syllabic tier, the moraic tier (which is redundant in languages with light syllables only), and the segmental/melodic tier (where segments are short hand for a feature matrix).   The advantage of this

representation is that each tier can be independently manipulated by phonological or morphological processes. In addition, as proposed in Clements [1985], Sagey [1986] and others, the feature matrix has an internal hierarchical structure, with an intermediate root node which links the hierarchically organized features to the mora. The exact organization of the features is still controversial. As argued in Archangeli [1984] and Christdas [1988], not all features are underlyingly specified, but here again, the authors do not agree on the degree of underspecification.

1.2. <u>The syllable structure in Kwawu</u>. The following are the surface syllables permitted in Kwawu:

(6) CV   ká   'bite'   pɨ̀nɨ́   'agree'

     V   ɔ̀ká   'he bites'   slé   'hide'

     N   ŋ̀ká   'not bite'   pàm̀   'sewed'
     |

     r   fr̀í   'go out'   pr̀á   'sweep'
     |

     VN   ɔ̀ŋká   'he doesn't bite' tlém 'cry out'

     CVN   bám   'embrace'   tɨ̀ntám 'wrestle'

A VN syllable results from morpheme concatenation (/ɔ+N+kɔ/ → ɔ̀ŋkɔ́ 'he should go', /tɪɛ+mu/ → tlém 'cry out'), and it behaves exactly like a CVN syllable. Syllabic r results from vowel deletion before r (/fìrí/ → fr̀í 'go out'), and stems of the surface shape CrV behave like disyllabic stems. No special consideration will be given to these surface syllables.

The syllabic structure of a stem can be determined on the basis of the verbal tone pattern. Monosyllabic verb stems, typically CV, have high tone (H), while disyllabic verb stems, typically CVCV, have low high tone (LH). CVV stems are disyllabic, since their tone pattern is LH, like that of CVCV stems. CVN stems are monosyllabic since their tone pattern is H, like that of CV stems. The following Verbal Tone rule assigns the H tone, while L is assigned by default:

(7) Verbal Tone

```
          H
          ¦
          ¦
[(σ)  σ
```

It would be incorrect to state the environment of Verbal Tone as the first
syllable from the end since in reduplicated disyllabic verbs, where the cop-
ied stem is prefixed, the H tone is also on the second syllable, kàsákàsà
'speak'. The L tone at the end of the form is assigned by default. Similar-
ly, in careful speech a L tone is assigned by default to the final consonant
in CVN stems.

What is crucial for the ensuing discussion is the structure of the CVN
syllable. As noted in section 1.1, the structure of CVC syllables is deter-
mined on language-specific grounds, as it can be monomoraic in some languages,
and bimoraic in others. In Kwawu a CVN syllable is bimoraic. The argument is
based on a vocalization rule, by which a word final nasal velar becomes a
high nasal vowel agreeing in rounding and ATR with the preceding vowel.

(8) Nasal Velar Vocalization

$$\begin{bmatrix} +cons \\ +nasal \\ -labial \end{bmatrix} \rightarrow \begin{bmatrix} -cons \\ \alpha round \\ \beta ATR \\ +high \end{bmatrix} \Big/ \quad \begin{matrix} V \\ \begin{bmatrix} \alpha round \\ \beta ATR \end{bmatrix} \end{matrix} \quad \underline{\quad} \#$$

Since Kwawu permits only velar and bilabial nasals in word final position,
the featuer [-labial] is sufficient to make sure that the rule would not turn
final m into a vowel. The output of Nasal Velar Vocalization undergoes a
Vowel-to-Vowel Nasalization rule, by which a vowel is nasalized when followed
by a nasal vowel. Some examples are given below:[3]

[3](i) The evidence for underlying final nasal velar comes from the past
tense forms, where the nasal velar surfaces. Past tense is formed by suffix-
ing an empty mora, to which the final segment spreads:

Present	Past	
ká	kàà	'bite'
tɔ́ŋ	tɔ̀ŋ̀	'sell'

The first L tone is derived by a Past Lowering rule, which simply lowers the

(9)   Nasal Velar   Vowel-to-Vowel
                Vocalization   Nasalization

    dɔŋ   → dɔõ   → dɔ́õ̀   'to soak'

    tɔŋ   → tɔõ   → tɔ́õ̀   'to sell'

    ɔdaŋ   → ɔdaĩ   → ɔ̀dáĩ̀   'room'

    saŋ   → saĩ   → sáĩ̀   'to return'

    bɩŋ   → bɩĩ   → bɩ́ĩ̀   'to be hot'

    sɛŋ   → sɛĩ   → sɛ́ĩ̀   'to hang on'

    deŋ   → deĩ   → déĩ̀   'strength'

As mentioned earlier, CVN stems are monosyllabic as their tone pattern is
H, like that of CV stems (additional evidence for the monosyllabicity of CVN
syllables is drawn from reduplicated forms; see section 3). Now, the ques-
tion is whether the CVN syllable is monomoraic or bimoraic. If CVN is mono-
moraic, the output of Nasal Velar Vocalization must be monomoraic as well,
and hence CV, where V is a short vowel (in case the vowel in the CVN syllable
is high) or a short diphthong (see the structural distinction between short
and long vowels and diphthongs in (3) above). Phonetically it is clear that
Nasal Velar Vocalization results in a long vowel or a long diphthong, which
must be represented by two morae. Therefore, it is concluded that CVN sylla-
bles are bimoraic, as it is implausible that Nasal Velar Vocalization would
have an effect on the syllable structure, changing monomoraic structure to
bimoraic. The process of Nasal Velar Vocalization and Vowel-to-Vowel Nasal-
ization is illustrated below:

(10)   Nasal Velar   Vowel-to-Vowel
   Vocalization   Nasalization
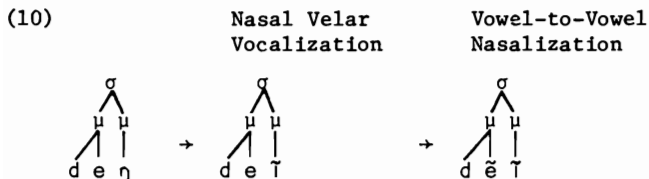
tone of the leftmost syllable in the past tense. The last L tone is assigned
by default.

(ii) Vowel-to-Vowel Nasalization is presumably a general rule. There are ŋo
vocalic sequences [-nasal][+nasal], but there are [+nasal][-nasal], e.g. mõá
'gather', as well as [+nasal][+nasal], e.g. mũá̃ 'crumple'.

As will be shown in section 3, due to dialectal variation CãN stems are re-
alized as monomoraic for the purpose of reduplication.

    Establishing that the CVN syllable is bimoraic, the following are the pos-
sible underlying syllable structures in Kwawu:

(11)   CV   V or Ņ   CVN

        σ   σ   σ   syllabic tier
        | | /\
        μ   μ   μ μ   moraic tier
       /\ | /\ |
       C V   V/N   C V N   segmental tier
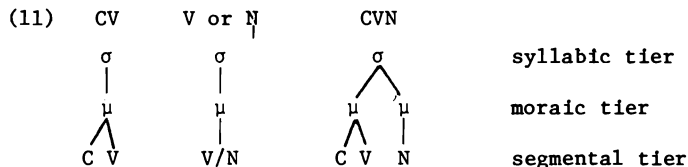
Notice that, as pointed out in Hyman [1985], syllable final nasal and syllab-
ic nasal, which are each the sole element dominated by the mora, contrast
only on the syllabic tier. Syllabic nasals are not specified for place fea-
tures since they always agree in place of articulation with the adjacent con-
sonant. Therefore, in order to distinguish between a syllabic (nasal) conso-
nant and a nasal vowel which constitute syllables, I assume that consonants
are specified for the feature [+consonantal].

    Given the above underlying syllable structures, the following set of
rules is proposed for deriving these structures:

(12) a. Underlyingly each vowel is linked to a mora, while consonants are
         free (C stands for unspecified consonant)

         μ   μ μ   μ   μ   μ   μ   μ
         | | | | | | | |
         d u b   d u a   C k o k ɔ   o d î   C p a b C

     b. Link a free segment to the adjacent mora to the right (non
         iterative)

         μ   μ μ   μ   μ   μ   μ   μ
        /| /| | /| /| | /| /|
        d u b   d u a   C k o k ɔ   o d i   C p a b C

     c. Build a syllable on every mora

         σ   σ σ   σ   σ   σ   σ   σ
         | | | | | | | |
         μ   μ μ   μ   μ   μ   μ   μ
        /| /| | /| /| | /| /|
        d u b   d u a   C k o k ɔ   o d i   C p a b C
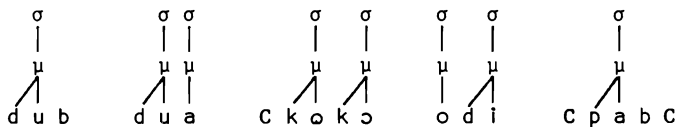
d. Assign a mora to a free segment

```
   σ                    σ   σ                         σ
   |                    |   |                         |
   μ μ                  μ   μ  μ                       μ   μ μ μ
  /| |        ----      |  /| /|         ----         |  /| | |
  d u b                 C k o k ɔ                     C p a b C
```

e. Link a free mora to the adjacent syllable on the left (non iterative)

```
   σ                                                          σ
   /\                                                         /\
   μ μ                                                        μ   μ μ μ
  /| |        ----              ----          ----           |  /| | |
  d u b                                                       C p a b C
```

f. Build a syllable on each remaining free mora

```
                              σ   σ   σ                        σ   σ   σ
                              |   |   |                        |    \  |
               ----    ----   μ   μ   μ          ----          μ   μ μ μ
                              |  /| /|                         |  /| | |
                              C k o k ɔ                        C p a b C
```

```
    nṹm        dùá        ŋ̀kòkɔ́         òdí        m̀pàm̀
   'suck'     'tree'     'chicken'     'he eats'   'not sewed'
```
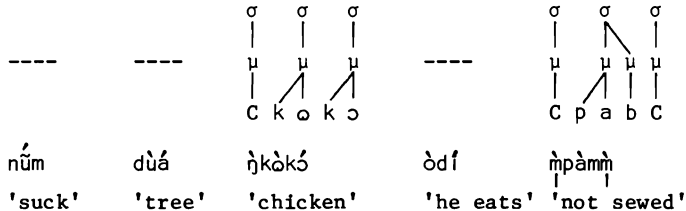
The syllabification rules provided above do not account for the nasal segments. This will be elaborated in the ensuing section, where the assignment of nasality is incorporated in the syllabification rules.

2. The Assignment of the Feature [Nasal]

The distinctive distribution of the feature [nasal] given in section 2.1 below could in principle be analyzed in linear terms, as presented in section 2.2., but this analysis is found inappropriate on universal and language specific grounds. I thus provide in section 2.3 a prosodic account, where it is argued that the feature [+nasal] is represented on the mora. The prosodic characteristic of the feature [nasal] is manifested by a revised version of the syllabification rules proposed in (12) above, with which the assignment of nasality is integrated.

2.1. **Descriptive background.** The following is the distinctive distribution of nasality in Kwawu:

(13) a. A nasal consonant must be followed by a nasal vowel

        C   V   * C   V

    [+nasal][+nasal]   [+nasal][−nasal]

    mã́ 'give'   *ma

    nɩ̃̀ 'his/her'   *nɩ

b. An oral voiced consonant must be followed by an oral vowel

    * C   V   C   V

    [−nasal][+nasal]   [−nasal][−nasal]
    [+voice]   [+voice]

    *bã̀   bá 'come'

    *dɩ̃̀   dɩ́ 'eat'

c. A voiceless consonant can be followed by an oral or nasal vowel

        C   V   C   V

    [−nasal][+nasal]   [−nasal][−nasal]
    [−voice]   [−voice]

    pàpã́ 'palm branch'   pàpá 'father'

    ètɩ̃́ 'it scratches'   ètɩ́ 'head'

d. Syllable final consonants must be nasal regardless of the preceding
    vowel

    C   V   C   C   V   C

      [+nasal][+nasal]   [−nasal][+nasal]

    ɔ̀tã́m 'diapers'   ɔ̀tám 'he wrestles'

    tã́ŋ 'to leave distance'   tɔ̀ŋ̀ 'sold'

e. Kwawu has syllabic nasals, which are confined to the edge of the
    word

    ŋ̀tɔ̃mã́ 'cloth'   m̀pàm̀m̀ 'not sewed'

    ŋ̀wòmã́ 'book'   ɲ̀ɥɩ́ʔ 'not chew'

Only the distinctive distribution of nasality is given above. Due to
various nasal assimilation rules these facts are not always surface true.
For instance, the rule of Vowel-to-Vowel Nasalization mentioned in section
1.2 yields a sequence of a voiced consonant followed by a nasal vowel, e.g.
deŋ → deɩ̃ (Nasal Velar Vocalization) → dẽɩ̃́ (Vowel-to-Vowel Nasaliza-
tion) 'strength', in violation of (13b). Similarly, surface violation of
(13a) is created by a rule of Nasal Assimilation by which a voiced consonant

is nasalized when preceded by a nasal consonant, yielding a nasal consonant
followed by an oral vowel (/N+bã́/ → ɰ̃mã́ 'not give'). Notice that nasal
consonants agree in place of articulation with the adjacent consonant on the
right.[4]

The facts given above show dependency in nasality within the mora; a
voiced consonant and a vowel dominated by the same mora must agree in nasali-
ty. Thus, in a CVN syllable C and V must agree in nasality (if C is voiced),
but V and N must not, since N is dominated by an independent mora.

2.2. **A linear account.** Within a linear account it must be assumed that in
Kwawu nasality is distinctive in vowels only, while all consonants are pho-
nemically oral. This line has been taken in Schachter and Fromkin [1968]
with respect to other dialects of Akan, and Capo [1983] with respect to Gbe
dialects. The following rules are then required for Kwawu under this assump-
tion:

(14) a. Prevocalic Consonant Nasalization

$$C \rightarrow \begin{bmatrix} +\text{nasal} \\ +\text{voice} \end{bmatrix} / \underline{\quad} \quad \begin{matrix} V \\ [+\text{nasal}] \end{matrix}$$

   b. Syllable Final Nasalization[5]

$$C \rightarrow [+\text{nasal}] / \underline{\quad}_\sigma]$$

Rule (14a) accounts for nasal consonants which precede a nasal vowel, e.g.
/bã/ → mã 'give', and rule (14b) accounts for syllabic nasals and syllable
final nasals, both in syllable final position, e.g. /Cpã́b/ → mpã́m 'not
sew').

_____

[4]But if the nasal consonant is followed by h , the former agrees in
place of articulation with the vowel which follows the h ; it becomes ŋ
when the vowel is back (hĩ̌ŋhã́m 'wave') and ɲ when the vowel is front
(hĩ̄ɲhĩ̄m 'wave'). As argued in Hayes [1986] and Steriade [1987], h (as well
as ʔ) does not have place features, thus allowing long-distance assimila-
tion.

[5]Rule (14b) could be stated as the following morpheme structure con-
straint: *[+consonantal -nasal] $_\sigma$], i.e. an oral consonant cannot appear at
the end of a syllable. This would require the assumption that Kwawu has
phonemic nasal consonants, since a constraint does not assign a feature but
rather limits its distribution.

     This analysis is found undesirable on both universal and language-specif-
ic grounds. Universally, there are just a few languages in which nasality is
distinctive in vowels only. According to a survey conducted by Cohn [1987],
at most 10 out of 164 languages fall into this category. Cohn herself wonders
whether "these cases are prosodic in nature, but were described or interpreted
by someone who did not consider the possibility of [nasal] playing a role in a
domain larger than the segment" [Cohn 1987:17]. This state of affairs is in-
deed strange, since the generalization about the phonetic distribution of na-
sality in languages is very different. If a language has nasal vowels it
must have nasal consonants, but if a language has nasal consonants it does
not necessarily have nasal vowels. Therefore, the assumption that the phone-
mic inventory of a language consists of nasal vowels but not nasal consonants
is unfeasible considering this universal distribution.

     From a language-specific point of view, the linear analysis derives the
low level nasality on consonants in a rather diverse manner. Prevocalic con-
sonants get their nasal specification on the basis of segmental structure on-
ly, while post vocalic and syllabic consonants get their nasality specifica-
tion on the basis of syllable structure.

2.3. A prosodic analysis. The prosodic analysis advocated here eliminates
this undesirable situation. First, neither vowels nor consonants are phone-
mically distinguished for nasality, it is rather the mora which exhibits this
distinction. The claim is that the feature [+nasal] is represented on the
mora, while [-nasal] is assigned by default at a later stage in the deriva-
tion. Second, all segments get their nasality specification in a unified
way, on the basis of the syllable structure. The feature [+nasal] percolates
to all nasal bearing segments dominated by the mora it specifies; the nasal
bearing units in Kwawu are voiced consonants and vowels.

     It has already been established in the literature that in some languages
the feature [nasal] has prosodic characteristics, as it tends to spread over
domains larger than the segment, e.g. Guarani [Goldsmith 1976] and Gokana
[Hyman 1982]. Like tone, which in some languages is represented on the mora
and in others on the syllable, nasality is represented in some language on

the consonant and in others on the mora or a larger unit.[6]

It is thus natural that nasality, being a prosodic feature, is interrelated with other prosodic phenomena, which in this case is the syllable structure. This relation is neatly accounted for by incorporating the assignment of nasality with syllabification rules. As shown below, two of the syllabification rules given in (12) above need to be modified in order to derive the appropriate distribution of the feature [nasal].

(15) a. (modified) Underlyingly each vowel is linked either to a [+nasal] mora (marked N) or to an unspecified mora, while consonants are free


     b. Link a free segment to the adjacent mora on the right (non iterative)

     c. Build a syllable on overy mora
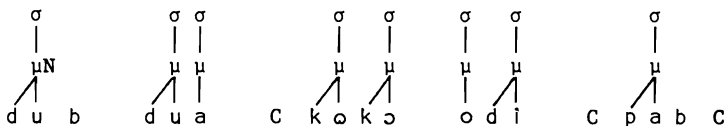
   d. (modified) Assign a [+nasal] mora to a free segment

---
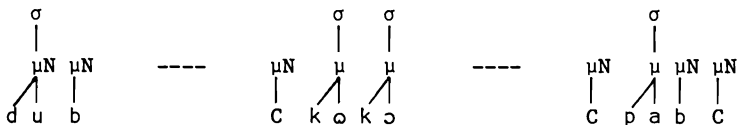
[6]Another way to account for nasal vowels is to assume an abstract representation of monomoraic VN, where V becomes nasal and N is later deleted (see Stahlke [1971] for this view with respect to nasal vowels in Ewe). If this is the case diachronically, it is not implausible that the feature [+nasal] is represented on the mora at a later stage of the language. A similar diachronic process is exhibited by tonogenesis, whereby a segmental distinction at one stage becomes a tonal distinction at a later stage (see Gil [1986] and references there). Thus the syllables CVC_1 and CVC_2 (where $C_1 \neq C_2$) become CV^{T1} and CV^{T2} (where T = tone and $T1 \neq T2$). Here, as well, the earlier segmental distinction is manifested on a prosodic domain.

e. Link a free mora to the adjacent syllable on the left (non
   iterative)

```
σ                                              σ
|                                             ⟋⟍
μN μN    ----        ----        ----     μN   μ μN μN
⟋| |                                       |   ⟋| | |
d u b                                      C   p a b C
```

f. Build a syllable on each remaining free mora

```
                    σ   σ   σ                  σ   σ   σ
                    |   |   |                  |  ⟋⟍  |
   ----   ----     μN   μ   μ      ----     μN   μ μN μN
                    |  ⟋|  ⟋|                 |   ⟋| | |
                    C  k ǫ k ɔ                C   p a b C
```

g. Feature percolation

```
σ          σ  σ      σ   σ   σ     σ   σ      σ   σ   σ
⟋⟍         | |       |   |   |     |   |      |  ⟋⟍  |
μ  μ      μ μ       μ   μ   μ     μ   μ      μ   μ μ  μ
⟋| |      ⟋| |      |  ⟋| ⟋|     ⟋| ⟋|      |   ⟋| | |
n ũ m     d u a     N  k ǫ k ɔ   o d i      N  p a m m
```

nũm   dua   ŋkǫkɔ   odi   mpamm̩

'suck'   'tree'   'chicken'   'he eats' 'not sewed'
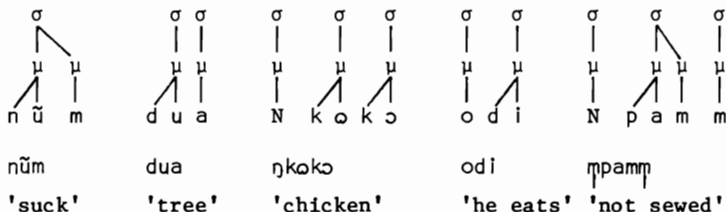
As mentioned earlier, the unspecified nasal consonant (N) agrees in place of articulation with the adjacent consonant.

One may argue that since vowels are lexically linked to morae, the proposal that [+nasal] is lexically specified on the mora is a notational variant to phonemic nasal vowels. An analogical example would be a language with phonemic stress and only monomoraic syllables. Assuming that vowels are lexically linked to a mora, stress would be then lexically specified on the mora. But I doubt that the phonemic inventory of this language could be argued to consist of stressed and stressless vowels, as it is by now well established that stress is a prosodic feature. Nasality in Kwawu is similar to to stress in this hypothetical language. Therefore, morae specified for the feature nasal are not notational variants of nasal vowels.

3. Nasality in Reduplicated Forms

Verbs in Kwawu are reduplicated to indicate distributive meaning or multiple object or subject, as in ká 'bite' ∿ k̀ìká 'keep biting', tɔ́ŋ

'sell' ∿ tòntóŋ 'sell to many people'. Disyllabic stems are reduplicated
by copying the whole stem as it is; kàsá ∿ kàsákàsà 'speak', bìsá ∿
bìsábìsà 'ask', tàá ∿ tàátàà 'run after', slé ∿ sléslè 'hide'. Mono-
syllabic stems are reduplicated by stem copying as well, but here the copied
vowel surfaces as high, agreeing in rounding and ATR with the stem vowel.[7]

(16) ká   kìká   'bite'
      pέ   pìpέ   'search'
      hú   hùhú   'sieve'
      bɔ́   bòbɔ́   'break'
      fέm   fìŋfέm   'lend'
      tám   tìntám   'wrestle'
      káŋ   kìŋkáŋ   'read'   [káĩ̀, kìŋkáĩ̀]
      tɔ́ŋ   tòntɔ́ŋ   'sell'   [tɔ́õ̀, tòntɔ́õ̀]

   Two cases deviate from this generalization:

   a. The copied vowel does not agree in rounding with the stem vowel
       when the stem vowel is a and the stem initial consonant is
       /b, p, f, m, kʷ, or sɥ/. Then, the copied vowel is [+round] as
       in (17a).

   b. The copied vowel does not agree in ATR with the stem vowel when the
       stem vowel is a and the stem initial consonant is what is termed
       in Clements [1981] a high consonant (Cʸ). Then, the copied vowel
       is [+ATR] as in (17b).

(17) a. fá   fòfá   'take'
         mã   mõmã   'give'
         pá   pòpá   'strike'
         kʷá   kʷòkʷá   'polish'
         pám   pòmpám   'sew'   (cf. fέm fìŋfέm 'lend')
         bám   bòmbám   'embrace'

     b. çɥá   çɥìçɥá   'peel'   (cf. çɥέ çɥìçɥέ 'look')
         tçɥá   tçɥìtçɥá 'cut'

_____

[7]Reduplication may reapply to its own output (rarely in disyllabic stems).
Reduplicated monosyllabic stems are reduplicated like disyllabic stems, as in
(bá →) bòbá ∿ bòbábòbà 'come'.

ɕↄ́ám   ɕↄ̀ɕↄ́ám   'pull away'

sɣá   sɣ̀sɣá   'be small'

The contrast between mono- and disyllabic stems is manifested by the cop-
ied vowel. The question is then what information is to be specified in the
reduplication rule to account for this distinction. In the spirit of Marantz
[1982], reduplication is viewed here as affixation of a prosodic unit unspec-
ified for segmental material. I uphold however McCarthy and Prince's [1986]
idea that the affixed unit is not composed of timing units (C- and V-slots)
as proposed by Marantz, but rather of prosodic units (mora, syllable, etc.).
The segmental material is later copied from the base stem and associated with
the affixed prosodic unit. The distinction between mono- and disyllabic re-
duplication lies on the copied prosodic unit; only monosyllabic prefixes are
prespecified for the feature [+high], which takes precedence over any contra-
dicting feature contributed by the stem.

The first stage of reduplication is copying the syllabic tier of the stem
and placing it on the left of the base.

(18) Syllabic tier copying
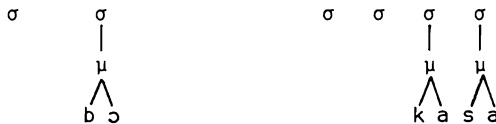
The difference between mono- and disyllabic reduplicated stems falls at the
succeeding stage, where the feature [+high] is linked to a monosyllabic pre-
fix only. By convention, the intermediate prosodic structure (in this case
the mora) is automatically set, to link between the feature and the syllable.

(19) Prespecification of [+high] to monosyllabic prefix
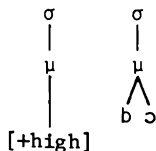
The next stage is to copy the stem and to link it to the prefixed syllable(s):

(20) Stem copying

k a s a d a s a → kàsákàsà   'speak'
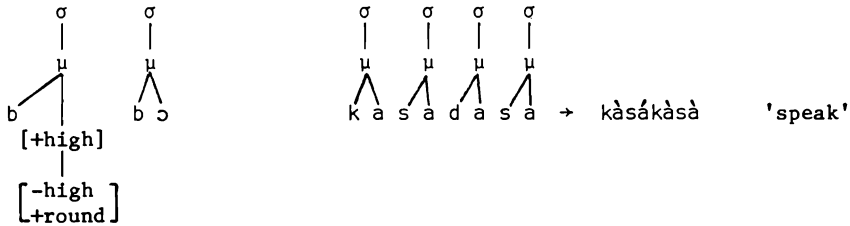
Since the features [+high] and [-high] contradict each other, the feature
[-high] is deleted, giving precedence to the prespecified feature. [-ATR]
is assigned by default.

(21)

b ɔ → bòbɔ́
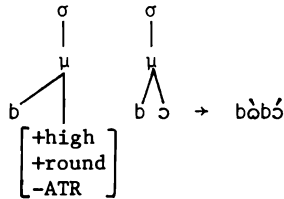
     Reduplication in Kwawu is basically stem copying, but it applies in two
stages: (i) copy the syllabic tier, and (ii) copy the segmental tier. A
specific rule which applies between the two stages, linking the feature
[+high] to monosyllabic prefixes, is responsible for the surface distinction
between mono- and disyllabic reduplicated stems. Notice that CVN stems, be-
ing monosyllabic, are reduplicated like CV stems, regardless of the number of
morae.

     underspecification: Relevant to the present discussion is the behavior
of monosyllabic stems with a (hereafter a-stems) with respect to rounding.
As mentioned earlier, in reduplicated a-stems the copied vowel is [+round]
if the stem initial consonant is a nonpalatal labial or is labialised (b, p,
f, m, sᶣ, kʷ) and [-round] elsewhere (also in the environment of labialised
palatals like tɕᶣ and ɕᶣ). This situation can be well accounted for as-
suming that a is underspecified and is thus represented by a mora linked to
an empty root node. The notion of underspecification is discussed in length
in Archangeli [1984] and Christdas [1988] where it has been argued that seg-

ments are not fully specified in the underlying representation. In Kwawu, as
I will show below, there is strong evidence for underspecifying a , which
yields the following feature matrix of vowels ([ATR] is omitted):

(22)   i   u   e   o   a
       high   +   +   -   -
       round -   -   -   -

The feature [round] must be specified for its two values in order to distin-
guish between reduplicated a-stems, where the vowel does not contribute a
value for [round] to the copied material, and e/i-stems, where the copied
vowel is always [-round] (cf. pám pòmpám 'sew' vs. fέm fὶŋfέm 'lend').
As for [high], McCarthy and Prince [1986] argue that this feature is speci-
fied for its negative value only. I find this representation inappropriate
since there are consonants in Kwawu which must be underlyingly specified for
secondary articulation [+high], and it is implausible that [+high] in conso-
nants is different from [+high] in vowels (I will return to the analysis of
McCarthy and Prince at the end of this section).

    After reduplication, the feature [+labial] spreads from a [+labial] non-
palatal consonant to the following vowel, as formulated below (° stands
for a root node):

(23) Labial Spreading
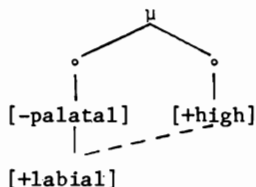
I assume that the feature [+labial] is realized as [+round] when linked to
vowels. Labial Spreading applies after the segmental material is copied,
such that it does not affect the stem a ; the feature [+high] is thus cru-
cial in the structural description. Notice that Labial Spreading is a fill-
in rule, rather than feature-changing rule and therefore does not affect high
vowels which are already specified for the feature round. Thus, fí ∿ fìfí

'go out' would not become *fó ∿ fòfó . Nor would it affect the copied vow-
el in e-stems since e contributes its [-round] feature to the copied vowel.
Thus, fέm fìɳfέm 'lend' would not become *fòɳfέm .

The following default rules then apply to fill in the missing features:

(24) a. [αback] → / $\begin{bmatrix} ---\ \alpha\text{round} \end{bmatrix}$

   b. μ
       |
       ○ → $\begin{bmatrix} +\text{low} \ +\text{back} \ -\text{round} \ -\text{ATR} \end{bmatrix}$

Rule (24a) fills in the value for [back], which is later required for the Na-
sal Assimilation rule across h (see footnote 4). Rule (24b) fully speci-
fies the features for a .[8]

It is worth mentioning the advantage of a complete underspecified a re-
garding [ATR]. As argued in Clements [1981] [+ATR] is specified on stems
while [-ATR] is assigned by default, with the exception of a , which is un-
derlyingly specified for [-ATR]. That is, not only is a the single vowel
specified for this feature, it is also specified for the default value. A
complete underspecification of a eliminates this cumbersome representation,
assuming that vowel harmony applies after a gets its features via rule
(24b). This is not a remote assumption since vowel harmony affects the ver-
bal clitics, which indicates its late application.

Recall also that in cases where the stem vowel is a and the stem ini-
tial consonant is CY , the copied vowel is always [+ATR], regardless of the
stem vowel. We must therefore assume a minor rule which links the feature
[+ATR] to a root node specified for [+high] only when preceded by this par-
ticular class of consonants. Notice that here again, in order to distinguish

---

[8]These rules are not crucially ordered. If (24a) applies first, it fails
to assign a value for [back] to the empty root node in the absence of the
feature [round]. If (24a) applies second, it does not affect the feature ma-
trix of a , filled in by rule (24b), since it is a feature-filling rule and
not a feature-changing rule.

between çⁿá ∿ çⁿìçⁿá 'peel' and çⁿɛ́ ∿ çⁿìçⁿɛ́ 'look', where only in
the former the copied vowel is [+ATR], we must assume that a is underspeci-
fied. Otherwise the copied vowel would be [+high -round] in both cases, and
there would be no way to account for the fact that [+ATR] is linked only when
the stem vowel is a .

     The process of reduplication of a-stems is illustrated below for bá ∿
bòbá 'come' (irrelevant features of b are omitted for simplicity):

(25) a. Reduplication (syllabic tier copying, high specification, segmental
         tier copying)

                [+labial] [+high]   [+labial]
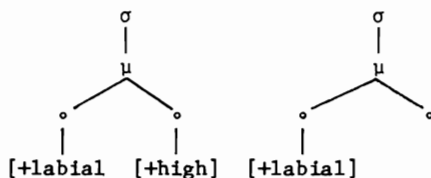
     b. Labial Spreading (23)

                              interpreted as

            [+labial] [+high]   [+labial]

            [+labial] ⎡+high ⎤ [+labial]
                       ⎣+round⎦

     c. Default rule (24b)

            [+labial] ⎡+high ⎤ [+labial]
                       ⎢+round⎥
                       ⎣+back ⎦
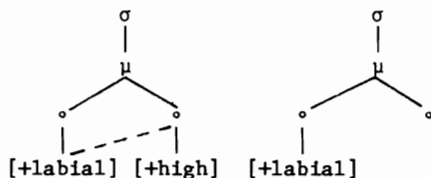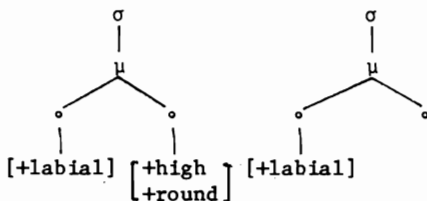
d. Default rule (24b)
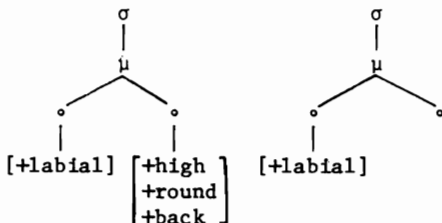
([-ATR] is assigned to ○ by default)
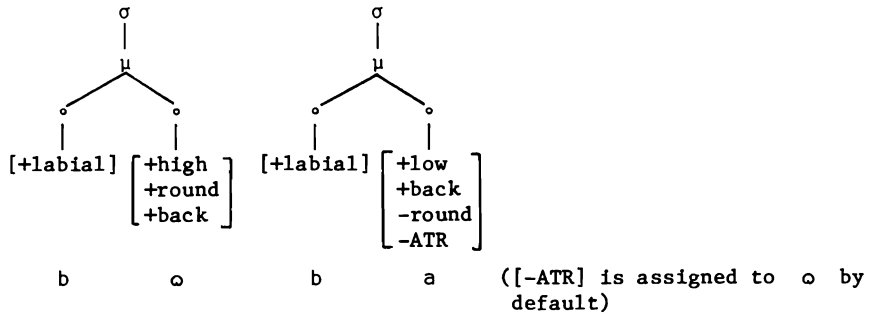
In stems where Labial Spreading does not apply, e.g. ká ∿ kìká 'bite', the negative value for [round] is assigned by default.

Thus, in order to account for the peculiar behaviour of a-stems it has been assumed that a is underspecified. Labial Spreading, which spreads the feature [+labial] from the stem initial non-palatal labial or labialized consonant to the following [+high] vowel is responsible for the feature [+round] (and consequently [+back]).

reduplication and nasality: The underspecification of a is a crucial factor in the distribution of nasality in reduplicated a-stems. In disyllabic stems nasality is copied along with the other features, e.g. kìsá̃ ∿ kìsá̃kìsã̀ 'turn over'. In monosyllabic stems the situation is more complicated as can be seen from the data below:

(26) a. ká̃   kìká̃   'say'
         sá̃   sìsá̃   'change'

     b. tí̃   tĩ̀tí̃   'scratch'
         hú̃   hũ̀hú̃   'see'

     c. má̃   mõ̀má̃   'give'
         ná̃   nĩ̀ná̃   'find'

     d. fá̃m   fõ̀ŋfá̃m   'embrace'
         só̃m   sõ̀nsó̃m   'worship'

The generalizations to be drawn from the above data are as follows:

a. In a CṼ stem (C is oral) where Ṽ is [-high] (thus must be a),[9] the copied vowel is oral.

b. In a CṼ stem where Ṽ is [+high], the copied vowel is nasal.

c. In a NṼ(N) stem, the copied vowel is always nasal (regardless of vowel height).

d. In a CṼN stem, the copied vowel is always nasal (regardless of vowel height).

Following the assumption that a is underspecified (thus represented by an empty root node linked to a mora), my claim is that the feature [+nasal] fails to percolate from the mora to the empty root node. That is, [+nasal] cannot be the sole feature dominated by a node (recall that syllabic nasals are specified for [+ consonantal], thus they license percolation). When reduplication applies, the feature [+nasal] is still located on the mora, therefore not copied along with the segmental tier. Later on, when the empty root node receives the features for a via rule (24b), the feature [+nasal] percolates, as it must eventually end up on the segmental tier. Recall that reduplication involves copying of the syllabic and the segmental tiers, but not the moraic tier. Therefore, the feature [+nasal] cannot be copied if it is still located on the mora. This explains why in reduplicated CṼ stems, which consist of an oral consonant and a low nasal vowel, the copied vowel is oral.

In Nã stems the feature [+nasal] does percolate, as there is a specified nasal bearing unit dominated by the mora, i.e. the consonant. It is thus assumed that [+nasal] can be the sole feature dominated by a root node only if it is doubly-linked, and the second root node is specified for other features.[10] That is, the representation in (27a) is ill-formed while that in (27b) is acceptable:

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[9]There are no phonemic mid nasal vowels in Kwawu. The only source of mid nasal vowels is the rule of Vowel-to-Vowel Nasalization mentioned in section 1.2, whereby a vowel is nasalized when followed by a nasal vowel.

[10]Similar restrictions are discussed in Itô [1986]. In Italian, for example, obstruents (other than s) can appear in coda position only if they are doubly-linked, e.g. Iabbro 'lip' but *aptro . The syllable structure is (C)CVC.

(27) a.

[+nasal]

b.

[αplace] [+nasal]

I assume that the representation is exhaustive, that is, features which are not specified are not there. Thus in (27a) the root node is specified for [+nasal] only, and therefore the representation is ill-formed. In (27b) the feature [+nasal] is doubly-linked, which licenses one empty root node.

The behavior of CãN stems does not conform with the above analysis, I believe for historical reasons. On the basis of the analysis provided above the prediction is that the copied vowel in CãN stems is oral, as it is the case with Cã stems; but this is wrong (see data in (26d). The problem is that CãN stems are reduplicated as if they were monomoraic, i.e. ä and N are dominated by the same mora, as in Nã stems. This is evident from the copied nasal vowel.

As described in Dolphyne [1987] for other dialects of Akan, many CVN stems are historically derived from CVNV stems. This actually explains the bimoraic structure of CVN stems at the current stage of the language: a disyllabic bimoraic stem became monosyllabic without effect on the moraic structure. The relevant details are as follows:

(i)   C   V   N   V > C   Ṽ   N   (ii) C   V   N   V > C   V   N
        [+high]   [+high]   [-high]   [-high]

The nasalization of a high vowel preceding a nasal consonant is a synchronic rule in Kwawu (as well as in some other dialects of Akan). The evidence comes from surface forms like bũm 'bark' whose underlying forms must be bum in accordance with the generalization given in (13b) that an oral voiced consonant must be followed by an oral vowel.

These are the cases which do not cause any problems. CVN stems, where V is oral, are underlyingly represented as bimoraic, as has been argued earlier and also in accordance with the historical facts. CṼN stems, where Ṽ is high, are underlyingly bimoraic CVN stems. High Vowel Nasalization precedes reduplication, as is evident from pairs like (kúm →) kúm ~ kùŋkúm 'kill', tɔ́ŋ (tɔ́ɔ̀) ~ tòntɔ́ŋ (tòntɔ́ɔ̀) 'sell'. If High Vowel Nasalization followed reduplication, we would expect *tõntɔ́ŋ .

The problem is then limited to CãN stems, which are historically monomoraic. Otherwise we would not expect the vowel to be nasal (recall that CaNV > CaN and not CãN). In general, historical considerations cannot provide evidence for synchronic analysis, since native speakers (at least infants and uneducated adults) do not have knowledge of the history of their language. But in this particular case the historical evidence is reflected in the neighboring dialects, and all dialects of Akan are mutually intelligible. The dialects which optionally preserve the final vowel are Asante and Akuapem, and surprisingly enough Mr. Yaw, who provided the data for this paper, is a fluent speaker of Asante (but a native speaker of Kwawu—see footnote 1). It is very possible then that in order to solve some surface irregularities, speakers search for a clue in another dialect.

My claim is that CaN stems are interpreted as bimoraic since they correspond to disyllabic stems in other dialects (and those which do not correspond to bisyllabic stems are regularized). CãN cannot correspond to disyllabic stems since the vowel is nasal and is therefore interpreted as monomoraic with respect to reduplication. This explains why the copied vowel in reduplicated CãN stems is nasal. As in Nã stems, [+nasal] is licensed to percolate since there is at least one specified root node which can dominate it, i.e. the syllable final consonant.

Notice, however, that this interpretation does not hold for Nasal Velar Vocalization (8), where all CVN syllables behave alike, i.e. as bimoraic. This is clearly reflected by the minimal pair tìntá́ŋ (tá́ŋ) 'dislike' ∿ tĩ̀ntá́ŋ (tá́ŋ) 'leave distance', which after Nasal Velar Vocalization becomes tìntá́ĩ ∿ tĩ̀ntá́ĩ . The distinction between tá́ŋ and tã́ŋ is lost after Nasal Velar Vocalization, resulting in tá́ĩ̀ , since they are both treated as bimoraic. But for the purpose of reduplication tá́ŋ is interpreted as monomoraic.

The cumbersome solution I suggest reflects the inconsistency of the language, which results from historical change. It is possible that there is an additional syllabification rule which merges two [+nasal] morae dominated by the same syllable:

(28)
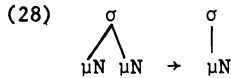
This representation is appropriate for feature percolation and reduplication. High Vowel Nasalization applies after reduplication. Therefore, we must assume that (28) is undone before this rule. Informally, all CVN stems are treated alike, i.e. as bimoraic, for the purpose of High Vowel Nasalization.

Another problem arises with disyllabic stems, where ã is copied as it is, e.g. kisã ∿ kisãkisã 'turn over' (*kisakisã) . To reconcile this discrepancy I assume that reduplicated disyllabic stems are subject to the Identity Constraint proposed in Wilbur [1973], which accounts for the tendency to preserve the identity between the stem and the copied material. In Tagalog for example, there is a Nasal Assimilation rule (maŋ+bigay → mamigay 'give (Modal)') and a reduplication rule which copies the first CV of the stem (sulat ∿ susulat 'write (Future)'). Since reduplication applies before the prefix maŋ- is attached, the expected prefixed reduplicated form of maŋ+bi+bigay is *mamibigay , where only the first b , i.e. the copied one, is affected by Nasal Assimilation. The actual form is however mamimigay 'give (Future)', where both b's are nasalized (although only the first one is preceded by a nasal consonant) in accordance with the Identity Constraint. Similarly in Kwawu, since in most disyllabic reduplicated stems the copied material is identical to the base, disyllabic stems with ã are regularized.

I turn now to the analysis of reduplication of other dialects of Akan presented in McCarthy and Prince [1986]. I abstract away from irrelevant disagreements which are due to dialectal variation.[11] Prespecification has

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[11]McCarthy and Prince argue that the mora is the relevant unit for reduplication. In their data CVN stems are either monomoraic or bimoraic, as some are reduplicated as monomoraic, i.e. monosyllabic, and others as bimoraic, i.e. disyllabic. In Kwawu all CVN stems are reduplicated as monosyllabic. So the minimal pair pam ∿ pampam (bimoraic) 'drive out' vs. pam ∿ pɪmpam (monomoraic) 'sew' does not appear in Kwawu. The reduplicated form of both is pòmpám . Similarly, dan ∿ dandan (bimoraic) 'turn' appears in Kwawu as a disyllabic stem danĩ , thus reduplicated danĩdanĩ .

been rejected by McCarthy and Prince mainly because it allows a wide range of
possibilities which are not attested. For instance, McCarthy and Prince note
that r , or probably consonants in general, are never found as the prespeci-
fied element. I believe that the absence of prespecified consonants (or con-
sonantal features) lies in the ill-formedness of a structure in which a pro-
sodic unit, mora or syllable, is linked to a consonant. Since the affixed
material in reduplication is prosodic in nature, and does not consist of seg-
mental positions (C- and V- slots), the prespecified element must be a poten-
tial syllabic nucleus. Indeed, languages which permit syllabic consonants
should in principle allow reduplicated affixes with prespecified consonants
(only those which participate as syllabic in the language). But this situa-
tion does not arise since consonants are not topical syllabic nucleis, as they
gain this property via the prosodic structure, and may lose it when prespeci-
fied at the stage which the rest of the stem is copied.

The alternative solution proposed by McCarthy and Prince, which abolishes
prespecification, is that in monosyllabic stems only part of the segmental
material is copied. Assuming that vowels are specified for [±round], [-low],
and [-high], only [round] and [low] are copied; [+high] is assigned later by
default to the copied vowel.

The major problem with the assumption that [+high] is a default feature
lies in consonants which must be underlying specified for the secondary articu-
lation [+high]. Consider Kwawu's phonemic inventory:

(28)	Labial	Alveolar	Palatal	Velar
Stops	p b	t d		k g
labialized				kʷ
Affricates			tɕ dʑ	
labialized			tɕʷ dʑʷ	
Fricatives	f	s	ɕ	
palatalized		sʸ		
labialized			ɕʷ	
labiopalatalized		s�		
Liquids & Glides		r	y	w

As argued in Keating [1988], palatals are complex segments, i.e. they involve double articulation, one of which is [+high]. In addition, in order to distinguish between s and sʸ the feature [+high] must be available. It is not to claim that vowels and consonants share the same features, but rather that consonants may have a secondary articulator, which is a vocalic feature. It would be far-fetched to believe that a secondary articulator [F] on consonants is not the same as the primary articulator [F] in vowels, especially in the presence of consonant - vowel assimilation rules, as Labial Spreading (23) and Nasal Assimilation (footnote 4). Therefore [+high] cannot be under-specified in Kwawu, which subsequently requires that monosyllabic reduplicated prefixes must be assigned a [+high] feature prior to copying the melodic material.

Another argument against the analysis presented by McCarthy and Prince is the feature geometry they assume. Given the underlying features [round], [low], and [high], they propose that only [round] and [low] are copied in monomoraic reduplication (while all the features are copied in bimoraic reduplication). Therefore they suggest that [round] and [low] are grouped together separate from [high]. This classification is rather odd since one would expect height features, i.e. [low] and [high], to be grouped together.

Empirical evidence against this proposal for Kwawu rests on the behavior of a with respect to rounding. Under this account there would be no explanation why Labial Spreading affects the copied vowel of pám 'sew' (pòmpám) but not of fέm 'lend' (fìɲfέm) , if it applies after [+high] is assigned by default. If Labial Spreading applies before [+high] is assigned, there is no explanation why the a of the stem is not affected. I thus conclude that McCarthy and Prince's analysis is not compatible with Kwawu data.

4. Conclusion

The account of distribution of nasality suggested here centers on the view that features are not necessarily represented on the segmental node in the underlying representation. This view is adopted from several studies which propose units larger than the segment as feature bearers, in order to account for the surface distribution of this feature within a domain larger

than the segment.

This, indeed, is not the immediate conclusion which comes to mind when observing the distribution of nasality in Kwawu, since its domain is a small prosodic unit. But I believe that the arguments set forth do demand the proposed conclusion. It has been shown that the alternative linear analysis does not coincide with universal observations, and it seems rather odd from a language specific point of view.

In addition, the behavior of nasality in reduplicated forms provides a strong support for the representation of the feature [+nasal] on the mora. Since the mora is not involved in reduplication, the feature [+nasal] is not copied when it fails to percolate.

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VERBAL INFLECTION IN KWAWU AKAN[*]

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Morphological processes in Kwawu are argued to be governed by
a condition which states that words are morphologically ana-
lyzable only in terms of properties of the head of the word.
The head of an affixed word is the most external affix. Cer-
tain rules apply only to bare stems and not to words with af-
fixes. A verb formed by reanalyzing adjacent verbs as a sin-
gle morphological word is accessible to these rules if its
head is a stem; non-head roots in the reanalyzed verb are in-
accessible to all morphological rules, as predicted.

0. Introduction

In this paper I discuss some aspects of the verb inflection system of
Kwawu (Akan), a Kwa language of Ghana. I shall be particularly concerned
with the conditions under which a given rule may apply to a word to attach an
affix to it. I believe that the correct analysis of much of these phenomena
can shed light on the theory of morphology, especially regarding constraints
on morphological rules.

In section 1, the theoretical assumptions that will serve as the start-
ing point of the discussion are set forth; in section 2, most of the inflec-
tional categories, and the rules that derive them, are discussed; section 3
discusses a set of inflectional phenomena which arise in serial verb con-
structions; and section 4 discusses some aspects of the derivational morphol-
ogy of nouns, adjectives, and verbs in Kwawu.

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1. Theoretical Background

1.1. <u>Word-headedness</u>. I assume a particular theory of morphology that re-
lies crucially on the notion "head of a word" in the following sense: the
head of a morphologically complex word is the morpheme, or formative, that
carries all of the information about that word that is accessible to rules.
In other words, at any point in the derivation, a word is a pair consisting
of its phonological form and its head. The statement of a rule can make ref-
erence only to features of heads of words, never to features contained exclu-
sively in formatives that are not heads. We refer to this constraint as the
Head Convention (HC):

> *Head Convention (HC)*: Morphological analysis refers only to properties
> of words [Grimshaw 1986:747], and properties of a word are just the prop-
> erties of the head of that word.

It is necessary to have an explicit way of determing what the head of
the word is. I assume, following Williams [1981] and Grimshaw [1986], that
the head of a word at a given point in the derivation is the affix or forma-
tive which was most recently applied to the word.

For example, the morphological properties of the Kwawu word nkyére[1]
'not catch' are just those of its head, which in this case is the negative
prefix N- . If a subsequent rule attaches another prefix to this word,
that prefix will become the head. For example, the progressive prefix ré-
is the head of rêŋkyére 'isn't catching'.

Of course, properties of stems or affixes can be inherited from previous
heads by affixes applied subsequently. In the preceding example, the word
n-kyére is still a verb, for example, with all of the lexical properties of
kyére 'catch'.

However, as will be seen below, reference to certain aspects of the

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[1]Kwawu data is given in standard (Akan) orthography. Where necessary,
they are accompanied by a broad phonetic transcription. In addition, tones
are transcribed as follows: ´ = high, ` = low; sentence initial syllables
that have no mark are low; otherwise unmarked syllables indicate no change
from the immediately preceding syllable; downstep is marked as a high tone
following a high tone.

structure of words is excluded in principle from morphological analysis. These fall into two basic types: first, properties of parts of a word which are never heads, and could never be inherited, since they are never properties of the word. This will be relevant to a rule that combines whole words to make a complex word.

The second type of property that cannot be inherited by affixes are merely stipulated as such. The analysis of Kwawu verb inflection, for example, requires us to postulate that *"stemhood"* is such a property: a word that contains an affix is never a stem.[2]

In fact, the notion "stem" is an interesting one in this light. In this paper, it is suggested (although not thoroughly argued) that the property of being a stem is relevant only for inflectional morphology and not for derivational operations. This is proposed as a solution to a paradox concerning reduplication.

It is worth noting how the HC differs from similar theories, e.g. Lieber's [1980] theory of feature percolation. In that theory, features of affixes take precedence over features of roots when determining which features percolate to the combined form. In most cases, the HC has the same result, since we are assuming that affixes are the head of affix + root combinations. However, by separating the notion "head" from that of "affix", we are able to make predictions for cases where a complex word contains no affixes, e.g. where it consists of two roots. Indeed, this is crucial to our analysis of adjacent verb series in section 3.

1.2. <u>Rule ordering</u>. Two other theoretical assumptions should be mentioned. The first is that morphological rules are explicitly ordered. It may be the case that certain rules are disjunctively ordered, following work such as Anderson [1982]. This will turn out to be of little consequence for the analysis proposed here, in part because much of the work that might have been done by disjunctively ordering rules has been taken up by the HC.

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[2]Ideally, this should follow from the definition of stem; however, this goes beyond the scope of this paper.

The second assumption concerns the distinction between derivational and inflectional processes. Following Anderson [1982], I assume that derivational processes operate in the lexicon and are not sensitive to syntactic information. Inflectional processes are post-lexical and are (or at least can be) sensitive to syntactic environment. This distinction will be crucial in the discussion of the relation between stemhood and reduplication, which I take to be a derivational process in Kwawu.

2. Verbal Affixation in Kwawu

In this section I will present the basic facts about verbal inflection in Kwawu, along with their analysis in terms of the word-headedness theory.

2.1. Basic tone. Verbs in Kwawu all have a basic lexical tone pattern which is predictable from the phonological structure of the word. The tone pattern that we refer to as basic is the pattern that shows up in the present (habitual) tense in non-negative sentences. This is one of the forms that have no (apparent) affixes; the others are the imperative and the stative. As we shall see, however, these (which have low tone) are best described as deriving from an underlying form with high tone.

Monosyllabic verb stems have as their basic pattern a high (H) tone, and most disyllabic stems have LH. For ease of exposition, I will refer to these two classes of verbs as Class 1 and Class 2, respectively. I will assume that the basic tone is assigned to verbs in the lexicon, according to the following rule:

(1) $\emptyset \rightarrow$ H
                    |
       $[_V(\sigma) \quad \sigma \ldots]$

That is, H is associated with the second syllable of the stem, if there are more than one, otherwise with the first. This rule applies in the lexicon to all verbs,[3] whether active or stative. Furthermore, assume that L is

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[3]Possible exceptions are irregular verbs, especially verbs that never inflect, e.g. de (usually glossed as 'take'), which always has low tone, except in certain embedded environments, in which case all verbs get high tone on the first syllable.

assigned (in the lexicon) to syllables that are not specified as H. Thus, Class 2 verb stems are LH, and monosyllabic stems are H.

There is, however, a class of disyllabic verb stems which have a basic tone pattern of HH, which I will call Class 3 verbs. Clearly, rule (1) is not sufficient. These verbs can be accommodated by (1) with some additional assumptions. First of all, it is significant that all such verbs are of the form CV_irV_i or CV_inV_i :[4] the vowel of the second syllable is always identical to the vowel of the first, and the second consonant is always [+sonorant,+coronal]. Therefore, we can assume that rule (2) applies in the lexicon after (1), with the result that (1) correctly assigns H to the first syllable of Class 3 verbs:

(2) $\emptyset \rightarrow V\ /\ \begin{bmatrix} +son \\ +cor \end{bmatrix}$ ___ #

For this analysis, it is also necessary to assume that the (high) tone of the syllable copied by (2) is copied along with the vowel. A sample derivation of the Class 3 verb stem hóro 'wash' is given in (3):

(3)
```
                H
                |
  /hor/   →    hor          by rule (1)


   H           H
   |          / \
  hor    →   horo           by rule (2)
```

The basic tone of a verb is assigned in the lexicon completely independent of any lexical features (such as active or stative), based only on syllable count. Morphological rules that change the tone of verbs (discussed in section 2.2) do just that: they alter the previously existing tone pattern, usually by deleting tones. The alternative would be for these rules to assign tones to unspecified forms and then to assign the basic pattern to the remaining unspecified forms at the end of the derivation. This alterna-

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[4]Stems of the form CVN may also be in this class. For discussion of the disyllabic status of CVN forms in Kwawu, see Dolphyne [1987] and Bat-El [1988].

tive is unworkable, as will be shown at the end of section 2.

2.2. <u>Verb inflection</u>. I will assume, following Anderson [1982], that in-
flectional formatives, or morphemes, are introduced by rule rather than be-
ing drawn from the lexicon and inserted in a phrase-marker. Nothing crucial
in this analysis depends on this assumption, but I believe it makes it easier
to describe the distribution of certain formatives.

2.2.1. <u>Affixes</u>. *Negative*: All verbs, whether active or stative, inflect
for negation in the same way, with a low tone nasal prefix. The rule for
this is given in (4):

(4) [+V,+negative] → Ǹ + V

   Optative: The rule that introduces the optative prefix is given in (5).
Optative is taken to be [-indicative,-imperative].

(5) [+V,-indicative,-imperative,-negative] → Ń + V

   The optative rule cannot apply to verbs that are inflected for negation;
negative optative verbs in Kwawu have only one nasal prefix, which has low
tone, indicating that it is the negative prefix.

   Future and Progressive: In non-negative simple sentences, future tense
is marked by a verbal prefix bέ- , and progressive aspect by the prefix
re- . In negative contexts, this distinction is neutralized. This is illus-
trated in (6):

(6) kofí re- ǹ- kɔ́   kùmáse   'Kofi will not go to Kumase' or
     K.   FUT/PR-NEG-go Kumase   'Kofi is not going to Kumase'

   In non-negative serial constructions, the prefixes bέ- and re- show
up only on the main (first)[5] verb of the construction. The following verb(s)
have a different prefix a- , called the consecutive prefix. We can write a
set of disjunctively ordered rules to introduce these formatives as in (7),[6]

---

   [5]These prefixes appear on the first verb of a verb series unless that verb
is uninflectable de 'take', in which case they appear on the second verb.

   [6]This is only for the sake of exposition. I do not wish to rule out a
syntactic analysis for the distribution of these affixes, for example.

where [+FUT/PR] is the feature shared by future and progressive forms:

(7) i.   [+V,+FUT/PR,-NEG,-PROG] → bɛ́ + V / main verb

   ii.   [+V,+FUT/PR,-NEG]   → re + V / main verb

   iii. [+V,+FUT/PR]   → rɛ́ + V / main verb

   iv.   [+V,+FUT/PR,-NEG]   → a + V

In negative contexts, the consecutive prefix does not show up, either, as (8) demonstrates:

(8) a. kofí bɛ- yɛ àdwúma a- má   yàw
     K.   FUT-do work   CONS-give Y.

    'Kofi will work for Yaw'

  b. kofí re- ǹ- yɛ́   àdwúma (*a-) m̀- má   yàw
     K.   FUT/PR-NEG-do work   (CONS-) NEG-give Y.

    'Kofi will not work for Yaw'

Thus the consecutive prefix, like the optative prefix, cannot cooccur with the negative prefix.

Note that other inflectional affixes (such as the negative prefix in (8b)) usually show up on all verbs in a serial construction. Indeed, it is a property of serial constructions in Kwawu that the verbs in a construction share all features for tense/aspect, mood, and negation.

Other affixes: The perfect prefix is a- , which is homophonous with the consecutive prefix. However, it is clearly a distinct affix, since it does cooccur with the negative prefix, as shown in (9):

(9) a. kofí a- ǹ- kɔ́   kùmáse
     K.   PERF-NEG-go Kumase

    'Kofi didn't go to Kumase'[7]

---

[7]The negative perfect in Kwawu is semantically simple past, whereas the negative past is semantically perfective. I have no explanation for this "switching" effect, but I do not think that it is a morphological effect per se. In other words, the forms given in (9) are *formally* perfect rather than past, and since we are concerned with the formal properties of inflection, we will ignore the strange semantic effect.

b. kofí a- ǹ- yɛ́   àdwúma *(a-)   m̀- má   yàw
    K.   PERF-NEG-do work   (PERF-) NEG-give Y.

    'Kofi didn't work for Yaw'

Past tense: The simple past tense in Kwawu is marked by three different
things, only two of which will concern us here. When a verb in the past
tense is S-final, it has an extra suffix, -ɛ , in addition to the other af-
fixes, which are described below. This suffix will be of no concern to us
here, although it will show up in some examples.

Of the two that will be discussed, one is a tone-changing rule and will
be discussed in section 2.2.2. The other is a suffix consisting of a lengthen-
ing of the final segment of the verb stem, e.g. kɔ́ 'go' becomes kɔɔ
'went', furá 'put on' becomes furáà 'put on (past)', hóro 'wash' becomes
horoo 'washed', etc. The added segment has low tone. We can write a rule
for this as in (10):

(10) [+V,+past] → V + x̀   where x is a slot on
                                the CV tier

This suffix is crucial to the discussion in section 3.

2.2.2. <u>Tone changing rules</u>. There are three morphological rules in Kwawu
whose sole effect is to make the tone of the verb stem low. These apply to
stative, imperative, and past tense forms. Since we are assuming that the
basic tone of a verb is assigned in the lexicon, these rules must delete
high tones associated with verb stems.

The past tense tone rule applies only to Class 1 and 3 verbs, i.e. to
verbs whose initial tone is H . This rule is given in (11):

(11)   H → Ø / [+V,+past]
        |
       [$_V$σ ...]

Rule (11) deletes H only if it is linked to the first syllable of the
verb. This provision correctly excludes Class 2 (basic disyllabic) verb
stems from undergoing this rule. The correct past tense form of bisá 'ask'
is bisáà , not *bisaa .

The tone-changing rules for stative and imperative verbs are given in

(12):

(12) a. H → ∅ / [+V,+imperative]

  b. H → ∅ / [+V,-active]

In each case, any H linked to the verb stem is deleted regardless of which syllable it is linked to. These rules differ in this respect from the past tense tone changing rule (11). It is necessary to state the rules in this way because the stative and imperative forms of all verbs are all low, whereas the past tense tone change does not apply to Class 2 verbs.

Nor can it be the case that the rules in (12) delete highs that are linked to final syllables. The reduplicated form of a Class 2 verb such as kyeré 'show' has a basic tone pattern of LHLL, i.e. kyerékyèrɛ 'teach'. This follows from   rule (1), which assigns basic tone to all verbs, along with one additional assumption, viz. that reduplication applies before (1). The reduplicated verb, kyerɛkyerɛ , is assigned H linked to the second syllable, as in (13):

(13)   H
          | by rule (1)
       kyerɛkyerɛ

All remaining unspecified syllables get linked to L . This must occur in the lexicon and before the application of (2) (since (2) was assumed to copy tones). This derives the correct tone pattern:

(14)   L H   L
         | | ∧
       kyerɛkyerɛ

This class of verbs (reduplicated dissyllabic verbs) is not exempt from (12a), as demonstrated in (15):

(15) a. bisabisa   'ask around!'
         ask:around-IMP

  b. *bisábìsa

  c. kyerɛkyerɛ no   'teach him!'
      teach-IMP him

    d. *kyerɛ́kyɛ̀rɛ no

    Thus it appears that rule (12a), and probably (12b) as well, are correct as given.

    The interesting thing about rules (11) and (12a,b) is that they do not apply to verbs which have the negative prefix. Example (16) shows this for the past tense, (17) for the stative, and (18) for the imperative:

(16) a. yaw hu -u   no   'Yaw saw him'
        Y. see-PAST him

     b. yaw n- hú -ù   no   'Yaw hasn't seen him' (see fn. 7)
        Y. NEG-see-PAST him

(17) a. kofí hyɛ̀   atadéɛ   'Kofi is wearing an *atade*'
        K. wear-STAT

     b. kofí ǹ- hyɛ́   àtadéɛ   'Kofi is not wearing an *atade*'
        K. NEG-wear-STAT

(18) a. twa   dúa no   'cut the wood!'
        cut-IMP wood DEF

     b. n- twá   dúa no   'don't cut the wood!'
        NEG-cut-IMP wood DEF

     c. kyekyere   no   'tie him up!'
        tie:up-IMP him

     d. n- kyekyérè   no   'don't tie him up!'
        NEG-tie:up-IMP him

    These "affixes" join the consecutive and prefixes in the class of formatives that cannot cooccur with the negative prefix. However, unlike the consecutive and optative prefixation rules, the inability of the tone changing rules to cooccur with the negative affix will be attributed to the HC.

2.3. Stemhood.

2.3.1. The analysis. As indicated above, the analysis of rules which cannot cooccur with the negative prefix involves the HC. In order to appeal to the HC to derive these facts, it must be the case either that the words these rules cannot apply to lack some property which is necessary for the application of the rules or that they have some property which is incompatible with

the application of these rules. In order for a word to have or lack a prop-
erty, its head must have or lack that property by the HC. Since the rules
in question do apply to bare stems, but not to verbs which have the negative
prefix, the problem must be with the prefix, which is the head of the words
at the point in the derivation where the rule tries to apply.

It could be, for example, that these rules all have the property of not
being able to apply to words that are [+negative]. As it turns out, however,
the solution has nothing to do with negation *per se*. It so happens that the
negative affix is usually the one that prevents these rules from applying be-
cause it is one of the few affixes that is attached before these rules apply.
But other affixes also block the application of these rules.

For example, the aspectual prefixes bɛ- (not to be confused with the
future tense prefix bɛ́-) and kɔ- , referred to by Christaller [1875] as
the "ingressive" prefixes, also block the application of the imperative rule,
as (19) demonstrates:

(19) a. tɔ   ɔkrámán   'buy a dog!'
         buy-IMP dog

     b. bɛ-tɔ́   ɔkrámán   'come buy a dog!'
         BE-buy dog

     c. tɔn   ɔkrámán   'sell a dog!'
         sell-IMP dog

     d. kɔ-tɔ́ǹ ɔkrámán   'go sell a dog!'
         KO-sell dog

We have already seen (in (15) and the accompanying discussion) that the
rule that changes the tone of the imperative does not care what syllable the
H that it deletes is linked to. Therefore, there must be something morpho-
logical that blocks the application of rule (12a) in (19).

The ingressive affixes look a great deal like the verbs bá 'come' and
kɔ́ 'go' and are translated into English as these, but these cannot be ana-
lyzed as independent stems, since verbs with an ingressive prefix behave mor-
phologically like one verb, taking only one affix between them. Observe the
contrast in (20), where (a) has a verb with the prefix kɔ- and one nega-

tive prefix, and (b) has a true serial construction and two negative prefix-
es:

(20) a.   kofí n- kɔ̀- dá
          K.   NEG-KO-sleep-STAT

          'Kofi should[8] not go to sleep'

     b.   yaw n- ká   ǹ- kyeré kòfí sɛ̀ɛ̀ afúa ho   yɛ fɛ̀
          Y.   NEG-say NEG-show K.   that A.   body do beauty

          'Yaw doesn't tell Kofi that Afua is beautiful'

Moreover, as Paul Schachter [p.c.] has pointed out, there are genuine
serial constructions with ingressive meaning using bá and kɔ́ as the first
verb. These often cooccur with verbs with ingressive prefixes, as in (21):

(21) kofí kɔ kɔ̀- dá   'Kofi goes to sleep'
      K.   go KO-sleep

Therefore, these must be genuine affixes. I conclude that in (19) the
imperative tone change is blocked because of the affix on the verb.

Similarly, the tone change of the stative is blocked if there are any
other affixes on the verb. Consider, for example, the sentences in (22),
which contain examples of stative verbs which are inflected for future tense
or optative mood:

(22) a.   kwasí yɛ̀   tíkyà   'Kwasi is a teacher'
          K.   be-STAT teacher

     b.   *kwasí yɛ tikyà
          K.   do teacher

     c.   kwasí bɛ- yɛ tikyà   'Kwasi will be a teacher'
          K.   FUT-be teacher

     d.   *kwasí bɛ-yɛ̀ tíkyà

     e.   kwasí n- yɛ tikyà   'Kwasi should be a teacher'
          K.   OPT-be teacher

     f.   *kwasí n-yɛ̀ tíkyà

---

[8]This sentence was actually elicited as negative optative, but as noted
above, this form is syncretic with the simple present negative.

Examples (22a) and (22b) show that only the stative form of the verb is
acceptable in this configuration. Nevertheless, in (22c) and (22e), the
verb stem has high tone rather than the low tone usually associated with the
stative. Apparently this rule, too, is blocked by the presence of an affix.

Why should the presence of an affix prevent these rules from applying?
It seems that they can only apply to bare stems, i.e. verbs that have no af-
fixes. I assume, then, that this is indeed the case: the rules must be
stated so as to apply only if the (head of the) word is a stem.[9] We can re-
write (11) as (11'), and (12) as (12'):

(11')   H → $\emptyset$ / [+V,+past. +stem]
          |
     [$_\text{V}$σ ...]

(12') a. H → $\emptyset$ / [+V,+imperative,+stem]

     b. H → $\emptyset$ / [+V,-active,+stem]

If the word has an affix at the point in the derivation when these rules
apply, then the affix, rather than the stem, is the head of the word, and the
rules cannot apply. This follows from the HC. It is no doubt not a coinci-
dence that all of the rules in Kwawu that have this property are rules that
delete tones rather than add an affix. I have no explanation as to why that
should be the case, however.

2.3.2. <u>A remark on basic tone insertion</u>. This analysis also provides an ar-
gument for the assumption made at the beginning of section 2, viz. that the
basic tone pattern of verbs is assigned in the lexicon and the tone-changing
rules alter the existing tone pattern. The alternative would be for these
rules to insert L in the appropriate place on a stem which is unspecified
for tone. At the end of the derivation, the basic tone is assigned (by in-
serting H and linking it to the appropriate syllable) to stems that have
not yet been specified for tone. It turns out that the domain of this rule
would be (a) the verbs which have remained bare stems, i.e. present habitual
forms, and (b) just those verb stems which are *not* heads of words. (a) and

---

[9]But see note 2.

(b) form a rather unnatural class, I think.

In contrast, the assumption that basic tone is inserted lexically and then changed in some environments allows us to state all the rules affecting the tones of verbs in uniform ways, so that they apply to natural classes, as it were.

3. Adjacent Verb Series (AVS)

In this section I will discuss a problem in the inflectional system of Kwawu and propose a solution which makes use of the HC. I believe that the theory of word-headedness provides an elegant solution to the problem, whereas other analyses seem ad hoc and unsatisfying. I will discuss what I think is the best alternative analysis at the end of this section and demonstrate its shortcomings.

3.1. The problem. In most cases, except where noted, serialization does not directly affect verbal inflection. Verbs in a series apparently always share all tense/aspect and mood features, with a few alternations specific to main verbs (usually the first member of the series), and they always agree in polarity. This is true, for example, in (23):

(23) kofí kà- a   asɛ́m kyèrɛ́-ɛ̀ yaw
      K.   say-PAST thing show-PAST Y.

      'Kofi told Yaw something'

Each verb shows the expected past tense marking. Ká 'say' is a Class 1 verb, so it has a lengthened final segment and low tone throughout the stem in this tense; kyerɛ́ 'show' is a Class 2 verb, so it gets only the final lengthening.

However, if the two verbs in (23) were adjacent, as in (24), then only the second one would get past tense marking. The first one gets neither the final lengthening nor the low tone on the stem. This I will refer to as the Adjacency effect.

(24) kofí ka   kyèrɛ́-ɛ̀   yaw sɛ́ɛ̀ ...
      K.   say-∅ show-PAST Y.   that ...

      'Kofi told Yaw that ...'

This contrast only appears in the past tense. In (25), the same two

verbs are in the perfect. In (25a) they are adjacent, in (25b) they are not:

(25) a. kofí a- ká   a- kyéré yàw séè ...
         K.   PERF-say PERF-show Y. that ...

         'Kofi has told Yaw that ...'

     b. kofí a- ká   asέm a- kyéré yàw
         K.   PERF-say thing PERF-show Y.

         'Kofi has told Yaw something'

The explanation of the Adjacency effect is the subject of section 3.2.

3.2. The analysis. The basic form of the analysis of the Adjacency effect
described in the preceding section is to assume that at some level of the
derivation adjacent serial verbs combine to form a single complex verb, so
that affixation rules apply to the combination as a whole, rather than to
each part. First, however, it will be instructive to see how a more straight-
forward analysis might handle these facts.

The observable differences between the past tense form in (24) and what
is expected, i.e. the form in (23), are two: (i) the past tense suffix
(lengthening) is missing from the first verb ká , and (ii) ká has high
tone, even though it is monosyllabic and should get low tone in the past
tense. The most straightforward account of this is to write rules that (i)
delete the final vowel of ká , and (ii) insert a high tone. These rules
would have to be stated so as to apply just to the past tense, which could
be handled by assuming that suffixes are deleted or long segments shortened,
and they must also apply only if the following word is a verb. Thus, it must
take into account both morphological and phonologocial information.

The most unattractive aspect of this approach, however, is that it does
not explain anything. If it turns out that there are other effects associat-
ed with this structure, the approach outlined above would have to say that
this is a coincidence, i.e. that the two effects are independent and unrelat-
ed. In fact, it says just that about the two parts of the effect noted: the
loss of the lengthened segment and the high tone on the first verb. It
leaves unexplained why these two things cooccur.

Instead we will seek an explanation that ties these facts together and al-

lows for the possibility that other observable effects will follow from the same explanation. Suppose, then, there is a rule that reanalyzes members of an adjacent verb series as a single complex word, as in (26):

(26) AVS Reanalysis

$$V_1 - V_2 \rightarrow [_v \, V_1 + V_2]$$

This rule applies to verbs that are string adjacent without reference to, or effect on, the syntax. The output is a single verb made up of the adjacent verbs of a serial construction. Since the effect of this rule only shows up in the past tense, it is necessary to assume either that it applies only to verbs in the past tense or that it applies before the past tense inflection rules but after the other inflectional rules.

The latter is definitely preferable, since it does not require the mention of a particular feature in the statement of the rule. In fact, we can find evidence that this approach is correct. In the past negative, the effect of rule (26) is apparent, in that the past tense inflection is missing from the first verb of the combination, but each verb has a negative prefix, as in (27):

(27) yaw n- ká   n- kyèrɛ́-ɛ̀   kofí sɛ́ɛ̀ ...
     Y. NEG-say-∅ NEG-show-PAST K.   that

     'Yaw has not told Kofi that ...'

This is explained by the assumption that (26) applies after certain inflectional affixation rules, but before the past tense rules. The rule that attaches the negative prefix applies first, affecting both verbs; then AVS REANALYSIS applies, making the sequence n-ká n-kyèrɛ́ a single word to which the past tense inflection rules apply just once.

In fact, (26) follows all of the inflectional rules discussed so far except for the two rules for past tense inflection (10, 11'').

Since the reanalyzed verbs are a single word when the past tense rules apply, they can only apply to the whole construction once. For rule (10), which adds a segment to the end of the word, this is straightforward: a single segmental slot is added to the right edge of the complex word, as in (28):

(28) [$_v$ka + kyerɛ] + ɛ

For rule (11'), which deletes a high tone on the stem of a verb in the past tense, matters are slightly more complex. In AVS constructions, this happens only on the rightmost member of the series if that verb is Class 1 or 3 (initial high tone):

(29) kofí pu   gù- uɛ[10]   'Kofi spat it out'
     K.   spit-∅ drip-PAST

The initial verb of this series, pú , not only lacks the additional segment of the past tense suffix, but it has high tone rather than low. To account for this, we need a way of referring to the rightmost verb in the reanalyzed construction.

Here is where the HC comes in. I propose (the head of) V_2 is the head of the reanalyzed verb in (26). Thus, in (29), the head of [$_v$pu gu] is gu after rule (26) has applied. This word ([pu+gu]) now has the property that its head (gu) is a stem. Consequently, rule (11), which applies only to stems, can apply to it. Rule (11') cannot apply to pu , however, since it is not the head of anything.

3.3. <u>Another post-reanalysis rule</u>. There is a morphological rule that applies to Class 3 verbs (the underlyingly monosyllabic verbs that become dissyllabic) and to reduplicated Class 3 verbs, but to no other class of verb. That rule is the subject of this section.

Consider the sentences in (30):

(30) a. ɔ- bɛ́- kyerè   kofí   'he will catch Kofi'
        3sg.-FUT-catch K.

     b. ɔ-bɛ́-kyerè twúm̀   'he will catch Twum'

     c. ɔ-bɛ́-kyere da biara   'he will catch everyday'

     d. ɔ-bɛ́-kyerè dá biara   'he will catch it everyday'

----

[10]The extra -ɛ in this case shows up on all verbs in the past tense that are clause final. It is in addition to the final segment lengthening that always shows up. See section 2.2.1.

In sentences (30a), (30b), and (30d), the final tone on the verb is low whereas in sentence (30c) the final tone is high. The verb is the same in each case and in the same tense, the only difference being that in (30a), (30b), and (30d), but not in (30c), the verb is followed by a noun phrase object, whether overt or empty. The pair (30a) and (30b) shows that the presence of the final L is not sensitive to the initial tone of the NP; pair (30b) and (30c) shows that it is sensitive to whether or not the verb has an NP object; and the pair (30c) and (30d) shows that this holds even if the object is null (inanimate, unemphatic object pronouns are almost always null in Kwawu).

This alternation only appears in Class 3 verbs (and their reduplicated forms) in non-suffixed tenses where the basic tone is preserved, i.e. present, future, progressive, and perfect tenses of active verbs. In all other tenses, Class 3 verbs end in low tone anyway.

Now suppose, for concreteness, that this alternation is triggered by a morphological feature related to the verb's ability to assign Case to an NP.[11] Let us call this feature [+Case]. The rule accounting for the alternation is given in (31):

(31) [+V,+Case] → V + L (low tone)

Class 3 verbs (and their reduplicated forms) have the unique property that their basic tone pattern consists of H linked to two syllables. We can assume, then, that the floating L inserted by (31) is allowed to link up to the syllable to its left only if that syllable is linked to an H that is also linked to another syllable. In this way, the fact that this alternation shows up only on Class 3 verbs is accounted for in terms of the phonological representation of the verb.

Recall that in section 3.2, AVS Reanalysis was claimed to apply to adjacent verbs in all tenses, even though the overt alternation usually only showed up in the past tense. If this is the case, then it ought to apply to

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[11]In fact, nothing depends on this assumption. I choose this feature merely because it relates the rule to the presence of NP.

the adjacent verbs in (32a), where the verbs are in the present tense. Furthermore, the first verb in the sequence is a (reduplicated form of a) Class 3 verb and hence should show the alternation described by (31). The expected final low tone is present in (32b) and (32c) but absent in (32a), where the verbs are adjacent:

(32) a. yaw kyekyére bɔ duá ho
         Y. tie:up   hit tree outside

         'Yaw ties it up to a tree'

    b. yaw kyekyérè no bɔ́ duá ho
        Y. tie:up   him hit tree outside

        'Yaw ties him up to a tree'

    c. yaw kyekyérè
        Y. tie:up

        'Yaw ties it up'

The absence of the expected low tone on the final syllable of kyekyére in (32a) is explained by the Head Convention under the analysis proposed here, assuming that rule (31) applies after AVS Reanalysis. Since kyekyere and bɔ are adjacent, they are subject to AVS Reanalysis and are a single complex verb at the point where rule (31) applies. But only properties of heads of words are visible to morphological rules, and kyekyere is not the head of this construction, bɔ is. Hence, the feature [+Case] is not visible to the rule, since they are not features of the head, therefore the rule cannot apply.

Since this rule also seems to be sensitive to whether serial verbs are adjacent or not and can be explained in terms of the analysis proposed in section 3.2, it provides independent evidence in favor of that analysis and hence in favor of the theory of word-headedness adopted here.

3.4. An alternative analysis. In this section I will discuss a plausible alternative analysis of the Adjacency effect, and then present arguments against it.

3.4.1. The analysis. In section 3.2, we tried to account for the fact, among others, that when serial verbs in the past tense are adjacent, only the right-

most member of the sequence gets inflected, while all the other members
showed their basic tone pattern, e.g. the pattern associated with the present
tense. But it is conceivable that the unexpected high tone on ka in (24),
repeated below, is due not to a lack of inflection, but rather to a high tone
inserted between the verbs:

(24) kofí ka   kyèrɛ́-ɛ̀ yaw sɛ́ɛ̀ ...
      K.   say-∅ show-PAST Y. that ...

      'Kofi told Yaw that ...'

If this is the case, then all that needs to be accounted for in (24) is
the absence of the final lengthening on ka . Suppose, then, that this is al-
so triggered by the inserted floating H in the following manner: assume
that the added segment (the past tense suffix), which is always associated
with low tone, deletes when followed by a floating H , allowing the H to
associate with the preceding syllable, i.e. the final syllable of the stem.

Where does the floating high tone come from? Suppose that in any serial
construction, no matter whether the verbs are adjacent or what the tense is,
a floating H is inserted before the second verb as a sort of connective mor-
pheme. Some independent evidence for this position is taken from sentences
like (33):

(33) a. yaw de   nó kyèrɛ́ kòfí   'Yaw shows him to Kofi'
         Y. take him show K.

     b. me- tɔ- ɔɛ́ tɔ̀n- nɛ   'I bought and sold it'
         1sg-buy-PAST sell-PAST

In (33a), the object pronoun nó has high tone whereas object pronouns in
general have low tone, as in (34):

(34) yaw fá   nò   'Yaw takes him'
      Y. take him

Similarly, in (33b), the final -ɛ of tɔɔɛ́ 'bought' is high, though
this form is usually low, as it is in tɔnnɛ 'sold'. This hypothesis pro-
poses that since pronouns have no lexical tone (L being a default tone), a
floating H before kyerɛ́ associates with the pronoun, making it high. The
reason it does not happen in (34) is because this is not a serial construc-

tion, and hence there is no connective floating H . The presence of this
floating H could also be used to account for the lack of final syllable
lowering illustrated in (32a) above.

In summary, the presence of a floating high tone before any non-initial
member of a verb series is responsible for (i) the deletion of the past tense
suffix and (ii) the presence of a high tone on the final syllable of a pre-
ceding adjacent verb. These phenomena are handled, it is claimed, without
recourse to a rule that combines adjacent verbs into a complex verb.

3.4.2. <u>Problems with the analysis</u>. The problems with this analysis are ba-
sically two: (i) when a broader range of data is considered, the analysis of
the association of the floating H needs to be complicated; (ii) it is un-
able to account for exceptional cases.

First, consider the case of Class 3 verbs in non-final position in a se-
quence of adjacent verbs, illustrated in (32a), repeated here:

(32) a. yaw kyekyére bɔ duá ho
         Y. tie:up-∅ hit tree outside
         'Yaw ties it up to a tree'

In this case, the last two syllables of the first verb have high tone,
not just the last one. Hence, there is a single high tone linked to two syl-
lables. There is now a problem, and that concerns the tone lowering rule dis-
cussed in section 3.3. If this rule applies to any tense in which these verbs
normally end in high tone, as suggested above, then what prevents it from ap-
plying in (32a)? On the other hand, if the rule of final syllable lowering
specifies that it cannot apply in the past tense, then that would entail a
complication of that rule.

I think that the problem with Class 3 verbs is actually a relatively mi-
nor problem, since these verbs have been argued to derive from underlying mon-
osyllabic forms.

Far more troublesome is the exceptional behavior of the serializing verb
de , often glossed as 'take'. When this verb is the initial member of a se-
quence of adjacent verbs in whatever tense, it has low tone, which is its ba-

sic tone pattern.[12]   This is illustrated in (35):

(35) a.   yaw de   ma- a   kofí
          Y. take give-PAST K.

          'Yaw gave it to Kofi'

     b.   kofí dè   kyekyére bɔ̀- ɔ   dúa no ho
          K.   take tie:up-∅ hit-PAST tree DEF outside

          'Kofi tied it up to the tree with it'

According to the hypothesis under consideration, de should have high
tone in this environment, since it precedes a floating high tone, which pre-
cedes the following verb. One way to handle this would be to say that for
whatever reason, de is an exception: verbs following de do not have a
floating H connective immediately preceding them. However, it was precise-
ly in this environment, i.e. after de , that the evidence for the high tone
was claimed to have been found, as in (33). Either de is not an exception,
in which case (35) is unexplained, or a high tone on an object pronoun occur-
ring between serial verbs is not related to the tone changes associated with
the Adjacency effect.

       The first alternative is unacceptable: if there is independent evidence
at all for the connective high tone, it comes from constructions with de
(recall (33)). The second alternative, as we shall see, is arguably the cor-
rect conclusion.

       The distribution of object pronouns with high tone is not entirely trace-
able to serialization and is quite clearly a fact about pronouns to the exclu-
sion of lexical NP's. Consider the sentences in (36) and (37):

(36) a.   yaw de   nó kyèrέ kòfí   'Yaw shows him to Kofi'
          Y. take him show K.

     b.   yaw de   ago   má kòfí   'Yaw gives velvet to Kofi'
          Y. take velvet give K.

(37) a.   kofí pu   nò gú   'Kofi spits him out'
          K.   spit him drip

     b.   kofí pù- u   nó gù- uɛ   'Kofi spat him out'
          K.   spit-PAST him drip-PAST

----

       [12]The so-called secondary tone environment is an exception to this: de ,
like all other verbs, has high tone on the first or only syllable in certain

In (36a), an object pronoun gets high tone, but in (36b), a noun with
lexical low tone retains its normal tone pattern in the same position. In
(37a) the object pronoun gets low tone after pǔ 'spit', which has high
tone, even though it is a serial construction. This contrasts with (37b),
where the pronoun again gets high tone after low tone puu 'spat'. This
suggests that, at the very least, whether an object pronoun gets high tone
depends on the form of the verb that precedes it.

Although the precise distribution of high tone object pronouns is not
clear, it is apparent that it is not part of the same phenomenon as the Adja-
cency effect. The presence of a floating high tone connective may ultimate-
ly be the explanation of the fugitive high tone pronouns and the high tone
suffix -ɛ , but this cannot explain the behavior of adjacent verb series.

3.5. <u>Rule order</u>. We have argued that a rule of AVS Reanalysis is necessary
to account for certain alternations in past tense inflection, as well as for
other alternations. It was claimed that this rule preceded the rules of past
tense inflection but followed most other inflectional rules. The order of
the rules described here, insofar as this is not stated explicitly in the
text, is given in (38). Rules mentioned in the same line indicate that there
is no evidence to suggest that one is ordered before another.

(38) i.   Ingressive prefixation
     ii.   Negative pref. (4); Optative pref. (5)
     iii.   Imperative tone change (12'a); FUT/PR rules (7); Perfect pref.
     iv.   Stative tone change (12'b)
     v.   AVS Reanalysis
     vi.   Past tense tone change (11')
     vii.   Past tense suff. (10)
     viii.   Class 3 transitivity rule (31)

It is assumed that all the rules mentioned in (38) are inflectional, i.e.
post-lexical. Some of the consequences of this are discussed in the next section.

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subordinate clauses. It is of course an interesting question as to why de ,
which never shows any inflection, apparently does show this alternation. Nev-
ertheless, this is arguably an independent issue.

4.   Related Areas

In this section, I discuss two related areas of Kwawu morphology that
are of interest to the theory adopted here. One is the status of the Head
Convention with respect to derivational morphology in nominal elements, and
the other concerns a particular problem posed for the analysis by reduplicat-
ed verbs, which I also take to be derivationally complex.

4.1. Nominal suffixes. Words of category [+N] can take certain prefixes,
which often distinguish between singular and plural. There are four such
prefixes: ɛ- , ɔ- , a- , and N- . The first two are always singular and
alternate with one of the other two in the plural. The last two can be sin-
gular or plural; if a noun takes a- in the singular, it could take either
a- or N- in the plural; if it takes N- in the singular, it takes N-
in the plural. Which prefixes a noun takes is a lexical (and largely idio-
syncratic) property of the noun.

Often, when a noun is formed by attaching the [+human] suffixes -ni
(sg.) or -fo (pl.) to a noun, the resulting word takes ɔ- as its singular
prefix and a- as its plural prefix, e.g. kyerɛkyerɛ 'teaching',
ɔ-kyerɛkyerɛ́ni 'teacher', a-kyerɛkyerɛ́fo 'teachers'.

This holds even if the noun root that the suffix attaches to takes dif-
ferent prefixes. For example, a-buro (sg.) m-buro (pl.) 'corn', becomes
ɔ-buro-ni (sg.) a-buro-fo (pl.), literally 'corn person(s)', but used to
mean 'European(s)'. This fact follows from the Head Convention, since the
suffix is the head of the word and consequently the properties of the suffix
are the properties of the word. The relevant properties of -ni/-fo are
that they take the prefixes ɔ- and a- . That is, whatever feature(s) of
nominal elements are associated with this set of prefixes is an inherent prop-
erty of the -ni/-fo suffix and therefore a property of a word that has one
of these suffixes as its head.

There are some apparent exceptions to this generalization. Specifically,
many place names that take a- as their prefix in both the singular and plu-
ral forms do so also when they appear with the derivational suffixes -ni or
-fo , e.g. asánte 'Asante (adj; sg. or pl.)', asante-ní , asante-fó 'Asan-

te person(s)'. The expected singular form ɔsante-ní also occurs, but the
existence of the forms with a- poses a problem for the Head Convention.

I suggest that the form asante has become reanalyzed in these cases as
a single morpheme without a prefix. One might wonder, then, why other pre-
fixes have not become reanalyzed as well. There are two possible explana-
tions for this. First, the prefixes ɔ- and ɛ- are always singular; any
noun or adjective that takes either of these in the singular takes either a-
or N- in the plural. Therefore, these are more transparently prefixes
since they always show alternation for number.

The second possible explanation has to do with the morpheme structure con-
straints of Kwawu. Root morphemes cannot have either /ɔ/ or /ɛ/ as their
first segment. Arguably, /a/ can be root-initial. There are function words
in Kwawu that begin with /a/ , where it is apparently not a prefix, e.g. áà
(relative clause complementizer). There are also other words where initial
/a/ looks like a prefix but behaves in a way that is unexpected of prefixes,
e.g. asé 'under (N)'. Although this looks like a prefix, it can occur in-
ternal to compounds, for example in kumáse (name of a city, but lit. 'under
the *kum* tree'). This is unexpected if these prefixes are inflectional and
therefore not attached in the lexicon. Therefore it is not surprising that
/a/ has been reanalyzed in some cases, but /ɔ/ and /ɛ/ have not.

4.2. <u>Reduplication</u>. Verb reduplication in Kwawu is a productive process.
Class 1 and 3 verbs reduplicate by copying the initial syllable to the left
of the root. The vowel in the copied syllable is always [+high], but agrees
in roundness with the original vowel. For example, twá 'cut' reduplicates
as twitwá 'cut to pieces'; bóro [borɔ] 'get drunk' becomes bobóro
[bobɔrɔ] 'get drunk (dist.)'.

Class 2 verbs reduplicate by total reduplication, with no change in the
vowels. For example, bisá 'ask' becomes bisábìsa 'ask around'; kyeré
'show' becomes kyerékyèrɛ 'teach'.

For all verbs, the reduplicated forms are subject to the tone assignment
rule (1): all reduplicated verbs have low tone on the first syllable and
high on the second syllable; reduplicated forms of Class 3 verbs have high on

the third syllable, as expected (see section 2.1). Since this rule was argued to apply in the lexicon and since it must follow reduplication, it follows that reduplication applies in the lexicon, as well. By the division adopted in section 1, this means that it is a derivational process.

This makes sense, since the meaning of the reduplicated form, though related, is not entirely predictable from the meaning of the root form. The most usual case, however, is for the reduplicated verb to have a distributive sense, while maintaining the basic sense of the root verb.

It is apparent that reduplication, at least in the case of Class 3 verbs (which is clearly partial reduplication), involves some sort of affixation. More specifically, it is clearly not a case of concatenating two stems.

Recall from section 2 that some rules of verb inflection are sensitive to whether or not the (head of the) word they apply to is a stem. One of these rules changes the tone on verbs in the imperative mood, making them all low. Since reduplication involves affixation, the imperative rule ought not to be applicable to reduplicated forms since reduplication (which is a lexical rule) applies before the inflectional rule of imperative.

However, this is not the case, as shown by (39):

(39) a. kyekyere   no   'tie him up!'
         tie:up-IMP him

     b. bisabisa   'ask around!'   (= 15a)
         ask:around-IMP

Assuming that the analysis of the imperative rule is correct, (39) poses a serious problem for the Head Convention. Indeed, it appears to be a straightforward counterexample to it.

Notice that it cannot be the case that derivational affixes are not subject to the HC since the derivational suffixes discussed in section 4.1 were shown to act as heads of the nouns they appeared in. Therefore, something else must be at work here. Reduplication has been argued to be a derivational, i.e. lexical, process of word formation. All of the other morphological rules affecting verbs that have been discussed are of the type that are typically thought to be inflectional.

I suggest, then, that the solution to the problem illustrated in (39) is that the notion of stem is undefined for lexical processes. In other words, a derivationally complex word is still a stem so long as it has no inflectional affixes. This corresponds rather neatly with the lexical/post-lexical distinction that is assumed to underly the derivational/inflectional distinction. A stem in this conception is a form that can be inserted into a phrase marker by Lexical Insertion. Derivational rules form words before Lexical Insertion, whereas inflectional rules operate on words that have been inserted into a syntactic representation.

One apparent problem with this approach to which I have no solution to offer is that it makes the rule that accounts for stative morphology inflectional. It follows the rules that attach the negative affix, the future prefix, and the optative prefix. These rules clearly apply to forms bearing features that are taken from the syntactic environment, i.e. tense and aspect features, which are properties of sentences or of verb phrases, and are therefore post-lexical.

One would think, however, that the feature [±active] is a lexical property of verbs, and independent of syntactic configuration. It is therefore odd that the one morphological rule that makes reference to that feature is a post-lexical rule.

5. Conclusion

We have discussed several morphological processes in Kwawu, especially in the domain of verbs, in the light of a theory of word-headedness, in particular that of Williams [1981] and Grimshaw [1986]. Whereas a variety of theories incorporating the notion "head of a word" could be envisioned, a theory that incorporates what we have termed the Head Convention has allowed us to make sense of a range of phenomena in Kwawu morphology that would otherwise be mysterious. To the extent that the particular analyses proposed here are valid, they provide evidence in favor of such a theory.

In particular, it was seen that there is a class of inflectional rules in Kwawu that can apply only to bare verb stems or, more precisely, only to verbs whose head is a bare stem. The analysis of verb reduplication leads us to

adopt a particular conception of what a stem is, which relies on the distinction between derivational and inflectional processes being based on a lexical/post-lexical division: a stem is a formative or morpheme that is inserted in a phrase-marker, and to which inflectional rules apply.

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THE BONDEI OBJECT PRONOUN IN
CLEFTS AND PSEUDO-CLEFTS*

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Verbs in Bondei, a Bantu language spoken in East Africa,
have crossreferencing pronouns which agree in noun class
with the subject and object of the clause. This paper
will examine the distribution of the syntactic category
object pronoun in four grammatical constructions: (a)
basic affirmative declarative clauses; (b) relative
clauses; (c) clefts; and (d) pseudo-clefts. In declara-
tive and relative clauses, the presence of the object
pronoun does not require a definite interpretation of the
object noun; the absence of the object pronoun does not
preclude a definite interpretation of the object noun.
In both cleft and pseudo-cleft constructions, however,
the object pronoun obligatorily functions to grammatically
mark clefted and pseudo-clefted objects as definite. In
the cleft constructions, the definiteness of the clefted
NP forces a contrastive interpretation. Thus, a judgement
concerning the function of this grammatical construction
with regard to contrastive function will be made on the
basis of the distribution of the syntactic category object
pronoun. In the pseudo-cleft constructions, it is not
possible to make the same judgment. Contrastive function
is unambiguously signaled by the relative morphology on
the verb of the pseudo-cleft. In this constuction, the
object pronoun serves only to force a definite interpre-
tation of the NP.

0. Introduction

This paper will examine the relation of the syntactic category object
pronoun and cleft and pseudo-cleft constructions in Bondei, a Bantu lan-
guage spoken in East Africa. Bondei, classified G24 by Guthrie [1948], is

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a member of the Seuta sub-group of northeast coastal Bantu [Nurse and Phil-
ippson 1980; Hinnebusch, Nurse and Mold 1981]. In addition to Bondei, this
sub-group includes Seuta, Shambala, Zigula, and Ngulu. There are approxi-
mately thirty to thirty-five thousand Bondei speakers in Tanzania in an area
southwest of the northwest coastal town of Tonga, north of the Pangani Riv-
er. In Bondei, subject and object pronouns appear as quasi-agreement affix-
es on the verb, i.e. these pronouns agree in noun class with the lexical
subject and object of the clause. Subject pronouns exhibit more variation
in form than object pronouns because they interact with other morphemes
which appear as prefixes on the verb, e.g. morphemes coding tense/aspect
and polarity. The form of the subject pronoun also depends upon whether
the verb exhibits main clause or relative clause morphology. (See the ap-
pendix for the forms of subject pronouns.)

In this paper, I will examine the distribution of the syntactic category
object pronoun in four grammatical constructions: (a) basic affirmative de-
clarative clauses; (b) relative clauses; (c) clefts; and (d) pseudo-clefts.
It has been noted that, in the languages of the world, cleft and pseudo-
cleft constructions show structural similarities to relative clauses [Taki-
zala 1972, Schachter 1973]. All three constructions are highly presupposi-
tional.[1] Clefts and pseudo-clefts, as opposed to relative clauses, however,
are focusing constructions, i.e. they present new or previously inactive in-
formation in conjunction with a presupposed clause which presents given or
already activated information.[2]

I will show that in Bondei the object pronoun in cleft and pseudo-cleft
constructions obligatorily functions grammmatically to mark clefted NP's as
definite. An NP which is marked as definite is coded by the speaker as
identifiable by the recipient. In the cleft constructions, the definite-

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[1]The terms "presupposition" and "assertion" are relevant on a logico-
semantic level of analysis, while the terms "new" and "given" or "identifi-
able" refer to the information status of NP's and are relevant on a dis-
course level of analysis.

[2]See Chafe [1984] for a discussion of previously inactive, already acti-
vated, and semi-activated information.

ness of the clefted NP forces a contrastive interpretation. In short, I
will show that the syntactic category object pronoun in the environment of
cleft constructions correlates indirectly with contrastive function through
the mediation of the definiteness of the clefted NP. In pseudo-cleft con-
structions, the same correlation does not obtain. Contrastive function
does not correlate through the mediation of the definiteness of the NP with
the presence of the syntactic category object pronoun in pseudo-cleft con-
structions. Contrastive function is unambiguously signaled by the relative
morphology on the verb of the pseudo-cleft. In other words, pseudo-clefts
without the object pronoun may be contrastive.

The task of demonstrating the correlation between object pronouns, def-
initeness, and constrastive function in clefts and pseudo-clefts must be
distinguished from an examination of the functional distribution of the ob-
ject pronoun in discourse, i.e. the way Bondei speakers actually use the ob-
ject pronoun. In conversation, speakers make communicative choices with re-
gard to the appearance of the object pronoun on the basis of discourse fac-
tors [Wald 1979]. In order to discover which discourse factors are rele-
vant for speakers' decisions and what functions the object pronoun serves,
it is necessary to look at conversational data. Since this paper is based
upon elicited data from a single Bondei speaker, no claims can be made as
to how the object pronoun functions in discourse.[3] In contrast, this paper
involves an examination of the syntactic environments in which the grammar
allows or disallows the presence of the object pronoun. A speaker's choice
to use or not use the object pronoun in a clause is conditioned by dis-
course factors. Such a choice, however, is only relevant in some environ-
ments. This paper will examine the syntactic environments in which such
speaker choice is relevant and the relation of these environments to defi-
niteness and contrast.

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[3]I am grateful to Rose Lugembe not only for her patience with my ignor-
ance and her acute linguistic insights, but for many hours of good company.

1.   The Origin and Development of the Bantu Object Pronoun

      Givón [1976] has suggested that the Bantu object pronoun originated in a
preverbal pronoun in left-dislocation constructions, i.e. in referent-propo-
sition constructions. This hypothesis is supported by the function of the
object pronoun as an anaphor of an NP previously mentioned in the discourse.
As an anaphor, the object pronoun, like any pronoun, is interpretable as
identifying the referents of given NP's or identifiable NP's. Givón further
suggests that right-dislocations, i.e. afterthought-topic constructions,
played an important intermediate step in the development of the object pro-
noun. It is suggested that right-dislocations gave rise to the pattern of
an object pronoun appearing with a post-verbal lexical object. Wald [1979:
511] suggests an alternative hypothesis, namely, that this distributive pat-
tern of the object pronoun most plausibly originated in the use of the ob-
ject pronoun to agree with *given* postverbal object NP's. He suggests that
it was the object pronoun, and not the lexical object, which was the origin-
al unusual element in discourse productions. In any case, like Swahili [Wald
1979:512], Bondei has further innovated in its use of the object pronoun
to include indefinite, nonreferential, and generic objects.

2.   The Object Pronoun in Declarative Clauses

2.1.   The object pronoun as an anaphor. The object pronoun can serve as an
anaphor of an NP previously mentioned in the discourse.

(1) a. mumangu   pengine enda   eze, ...
        my husband maybe   3Ps FUT come[4]

        'my husband might be coming, ...'

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[4]The following abbreviations are used in the examples.

1Ps	first person singular	subject person/number
2Ps	second person singular	pronoun person/number
3Ps	third person singular	
1Pp	first person plural	
2Pp	second person plural	
3Pp	third person plural	

  b. nenda ni-mw-one
    1Ps FUT 1Ps-OP-see

    'I will see him'

(2) a. Jessie, wa-manya vigano vyovyose?
    Jessie 2Ps PRES-know stories any

    'Jessie, do you know any stories?'

  b. nki-vi-jaa
    1Ps PERF-OP-forget

    'I have forgotten them'

The object pronoun can serve as an anaphor of a left-dislocated NP. It is obligatory in this construction.

(3) wana   na- $\left\{\begin{matrix} wa- \\ *\emptyset \end{matrix}\right\}$ kunda

  children 1Ps PRES-OP-love

  'the children I love them'

(4) vikombe nki- $\left\{\begin{matrix} vi- \\ *\emptyset \end{matrix}\right\}$ tua

  cups 1Ps PERF-OP-break

  'those cups I broke them'

PRES	present	verb tense/aspect
PAST	past	
PERF	perfect	
FUT	future	
IND	indicative	verb mood
INF	infinitive	
SUBJUNC	subjunctive	
PART	participle	
COP	copula	verb type
APPLIC	applicative	
NEG	negative	verb polarity
OP	object pronoun	
EMP	emphatic	
REL	relative	
#1,#2, etc.	noun class	
DEM	demonstrative	
PL AN	plural animate	
SG AN	singular animate	

No intonation break is noticeable between the left-dislocated NP and the
rest of the clause.

2.2. <u>The object pronoun and postverbal objects</u>. Example (5) demonstrates
that a definite human object can appear with or without the object pronoun.

(5)   ka- $\left\{ {wa- \atop \emptyset} \right\}$ ona   wana   wada
       3Ps PERF-OP-see children those

       'he saw those children'

Example (6) demonstrates that a definite inanimate object can appear with or
without the object pronoun.

(6)   baadae   nki- $\left\{ {i- \atop \emptyset} \right\}$ pata   kae   ida tiketi
       at last 1Ps PERF-OP-get already DEM ticket

       'at last, I finally got the ticket'

Examples (7) through (10) **demonstrate** that the object pronoun can serve to
definitize an NP.

(7)   ka-$\emptyset$-ona   wana
       3ps PERF-OP-see children

       'he saw some children'

(8)   ka-wa-ona   wana
       3Ps PERF-OP-see children

       'he saw the children'

(9)   a-ka-$\emptyset$-kunda   kitabu,...
       3Ps-PART-OP-want book

       'when she wants a book, ...'

(10)   a-ka-ki-kunda   kitabu,...
       3Ps-PART-OP-want book

       'when she wants the book, ...'

Example (11) demonstrates that an indefinite human object can appear with
or without the object pronoun.

(11)   wa- $\left\{ {wa- \atop \emptyset} \right\}$ ona   wanafunzi washano
       3Pp PERF-OP-see students five

       'they saw five students'

Example (12) demonstrates that an indefinite inanimate object can appear with or without the object pronoun.

(12) wa- $\left\{ \begin{matrix} ya- \\ \emptyset \end{matrix} \right\}$ gua   machunga mashano
      3Pp PERF-OP-buy oranges five
      'they bought five oranges'

Examples (13) through (15) demonstrate that nonreferential objects can appear with or without the object pronoun.

(13) ka-onda   ku- $\left\{ \begin{matrix} m- \\ \emptyset \end{matrix} \right\}$ toa mtu
      3Ps PERF-want INF-OP-hit   person
      'he wanted to hit somebody'

(14) nke-ku $\left\{ \begin{matrix} vi- \\ \emptyset \end{matrix} \right\}$ ona   viti   vyovyose
      NEG 3Ps PAST-INF-OP-see chairs any
      'he didn't see any chairs'

(15) nke-ku- $\left\{ \begin{matrix} wa- \\ \emptyset \end{matrix} \right\}$ ona   wana   wowose
      NEG 3Ps PAST-INF-OP-see children any
      'he didn't see any children'

When there is no lexical object, the object pronoun precludes any indefinite or nonreferential interpretation. It must be interpreted as a definite NP.

(16) nke-ku-wa-ona
      NEG 3Ps PAST-INF-OP-see
      'he didn't see $\left\{ \begin{matrix} them \\ {}^*any \end{matrix} \right\}$'

Example (17) demonstrates that a generic object can appear with or without the object pronoun.

(17) wantu wa- $\left\{ \begin{matrix} mw- \\ \emptyset \end{matrix} \right\}$ ogoha simba
      people 3Ps PRES-OP-fear lion
      'people fear the lion'

3. The Object Pronoun and Pronominal Objects

The object pronoun is obligatory for pronominal human objects, which, of course, are both human and definite. Animate nonhumans and inanimates do not require the object pronoun.

(18)   ka- $\left\{ \begin{array}{c} ni- \\ *\emptyset \end{array} \right\}$ toa   mie   'he hit me'
       3Ps PERF-OP-hit 1Ps

(19)   na- $\left\{ \begin{array}{c} ku- \\ *\emptyset \end{array} \right\}$ toa   wewe   'I am hitting you'
       1Ps PRES-OP-hit you

(20)   nki- $\left\{ \begin{array}{c} m- \\ *\emptyset \end{array} \right\}$ toa   yuda   'I hit him'
       1Ps PERF-OP-hit 3Ps DEM

(21)   ka- $\left\{ \begin{array}{c} di- \\ \emptyset \end{array} \right\}$ toa   dida   'he hit it' (dog)
       3Ps PERF-OP-hit #5 DEM

(22)   ka- $\left\{ \begin{array}{c} ki- \\ \emptyset \end{array} \right\}$ toa   kida   'he hit it' (chair)
       3Ps PERF-OP-hit #7 DEM

4. Multiple Objects

Bondei allows multiple objects and multiple object pronouns for three argument verbs.

(23)   nki-ki-mw-enka   mdee   kitabu
       1Ps PERF-OP #7-OP #1-give girl (#1) book (#7)

       'I gave the girl a book'

Only a single object pronoun can appear for compound direct objects of two argument verbs. If direct objects can take different concord, the object pronoun agrees with the first NP.

(24)   nki- $\left\{ \begin{array}{l} m- \\ *ki- \\ *m-ki- \end{array} \right\}$ toa   mwana   na kitabu

       1Ps PERF-OP $\left\{ \begin{array}{l} (\#1) \\ (\#7) \\ (\#1-\#7) \end{array} \right\}$ -hit child (#1) and book (#7)

       'I hit the child and the book'

(25) nki- $\begin{Bmatrix} ki- \\ *m- \\ *ki-m- \end{Bmatrix}$ toa   kitabu na mwana

   1Ps PERF-OP $\begin{Bmatrix} (\#7) \\ (\#1) \\ (\#7-\#1) \end{Bmatrix}$ -hit book .and child

   'I hit the book and the child'

   Compound objects which take the same concord can be marked by a plural object pronoun. In example (26), where the objects both take animate concord, the object pronoun which agrees with plural animate objects can appear.

(26) nki-wa-wisha   mdee na mbwanga
      1Ps PERF-OP-feed girl and boy

   'I fed the girl and the boy'

   In example (27) the object pronoun di agrees with the first lexical object kui 'dog', and the object pronoun wa is the plural animate object pronoun which agrees with both lexical objects. The sequence of object pronouns di-m which are the agreement markers for kui 'dog' and mbwanga 'boy', respectively, can only be interpreted as the direct and indirect objects, giving the interpretation 'I fed the dog to the boy'.

(27) nki- $\begin{Bmatrix} di- \\ wa- \\ *di-wa- \end{Bmatrix}$ wisha kui na mbwanga

      1Ps PERF-OP-feed   dog and boy

   'I fed the dog and the boy'

   Applicative or prepositional verb forms are restricted as to which lexical object can be crossreferenced by the object pronoun. Only the object of the prepositional meaning can be marked by the object pronoun, as demonstrated in examples (28) and (29).

(28) nki- $\begin{Bmatrix} wa- \\ *i- \end{Bmatrix}$ do-e-a   nkande   mdee na mbwanga

      1Ps PERF- $\begin{Bmatrix} OP\ (PL\ AN) \\ *OP\ (SG\#9) \end{Bmatrix}$ -take-APPLIC-IND food(\#9) girl and boy

   'I took food from/to the girl and the boy'

(29)   nki- $\left\{ \begin{matrix} \text{m-} \\ \text{*wa-} \end{matrix} \right\}$ gus-i-a

  1Ps PERF- $\left\{ \begin{matrix} \text{OP (SG AN)} \\ \text{*OP (PL AN)} \end{matrix} \right\}$ -sing-APPLIC-IND

  'I made the children sing for the teacher'

In summary, I have shown that the object pronoun in Bondei can crossref-erence a wide range of NP's in simple declarative clauses. It can serve as an anaphor for previously mentioned NP's. It can mark topicalized NP's. It can also mark given and new postverbal NP's, including nonreferential and generic NP's. In the absence of a lexical object, however, the object pro-noun must be interpreted anaphorically. The object pronoun is obligatory when the object is a pronoun which refers to a human referent. In the case of two argument verbs, only a single object pronoun can appear. The object pronoun must agree with the first NP when direct objects take different con-cord. When direct objects take the same concord, a plural object pronoun may appear. In the case of three argument verbs, two object pronouns ap-pear; the first must be interpreted as the direct object, and the second as the indirect object. In the case of applicative verbs, the object pronoun must be interpreted as the object of the prepositional meaning.

5.   The Object Pronoun in Relative Clauses

Relative clauses are formed (1) by relative morphology on the verb of the embedded clause or (2) by the use of the relativizing word amba 'to say' with the verb retaining main clause morphology. When relative verbal morphology is used, the relative can be inflected for tense, as in example (30), or be realized as a tenseless construction, as in example (31).

5.1.   Subject relatives. The following are examples of subject relatives.

Verb Coding

(30)   mvyie e-ku-gwa-e   'the woman who fell down'
       woman 3Ps PAST-INF-fall down-REL

(31)   mvyie mwe-ku-gwa-e   'the woman who $\left\{ \begin{matrix} \text{is falling down} \\ \text{fell down} \\ \text{will fall down} \end{matrix} \right\}$'
       woman 3Ps REL-INF-fall down-REL

amba   Coding

(32)   mvyie amba-e   ka-gwa   'the woman who fell down'
       woman say-REL 3Ps PERF-fall down

5.2.   Object relatives.   Although object relatives can be formed without an
object pronoun, the consultant consistently included them in elicited rela-
tives of definite NP's. No meaning difference was noted for constructions
with and without the object pronoun. The head of the relative which the ob-
ject pronoun crossreferences is in preverbal position.

5.2.1.   Inanimate objects.

Verb Coding

(33)   kiti   n-e-ku- $\left\{ {ki- \atop \emptyset} \right\}$ gua-cho   'the chair which I bought'
       chair 1Ps-PAST-INF-OP-buy-REL

(34)   tonte   ni- $\left\{ {di- \atop \emptyset} \right\}$ da-do   'the banana which I am eating'
       banana 1Ps PRES-OP-eat-REL

amba   Coding

(35)   kiti   amba-cho nki- $\left\{ {ki- \atop \emptyset} \right\}$ gua   'the chair which I bought'
       chair say-REL 1Ps PERF-OP-buy

(36)   tonte   amba-do n-a- $\left\{ {di- \atop \emptyset} \right\}$ da   'the banana which I am eating'
       banana say-REL 1Ps-PRES-OP-eat

5.2.1.   Animate objects.

Verb Coding

(37)   mwana n-e-ku- $\left\{ {m- \atop \emptyset} \right\}$ toa-e   'the child whom I hit'
       child 1Ps-PAST-INF-OP-hit-REL

(38)   mwana ni- $\left\{ {m- \atop \emptyset} \right\}$ toa-e   'the child whom I am hitting'
       child 1Ps PRES-OP-hit-REL

amba   Coding

(39)   mwana amba-e   nki- $\left\{ {m- \atop \emptyset} \right\}$ toa   'the child whom I hit'
       child say-REL 1Ps PERF-OP-hit

(40) mwana amba-e   n-a-$\left\{ \begin{matrix} m- \\ \emptyset \end{matrix} \right\}$ toa   'the child whom I am hitting'
      child say-REL 1Ps-PRES-OP-hit

5.3. <u>Ambiguity in relative clauses</u>. Because the object pronoun can appear
in a relative construction but is not obligatory, some relatives are ambigu-
ous. The following examples without the object pronoun can be interpreted
as subject or object relatives.

(41) mwana mwe-ku-ona-e
      child $\left\{ \begin{matrix} 3Ps \\ 2Ps \end{matrix} \right\}$ REL-INF-see-REL

      'the child who saw'   (SUBJECT RELATIVE)
      'the child whom you saw' (OBJECT RELATIVE)

(42) mwana e-ku-ona-e
      child 3Ps PAST-INF-see-REL

      'the child who saw'   (SUBJECT RELATIVE)
      'the child whom he saw' (OBJECT RELATIVE)

The following examples with the object pronoun can be interpreted as subject
or object relatives.

(43) mwana mwe-ku-mw-ona-e
      child 3Ps REL-INF-OP-see-REL

      'the child who saw him' (SUBJECT RELATIVE)
      'the child whom he saw' (OBJECT RELATIVE)

(44) mwana e-ku-mw-ona-e
      child 3Ps PAST-INF-OP-see-REL

      'the child who saw him' (SUBJECT RELATIVE)
      'the child whom he saw' (OBJECT RELATIVE)

Although the grammar permits these interpretations, some are more felici-
tous than others in context. The choice of the subject marker (e vs. mwe)
and the presence or absence of the object pronoun are both relevant factors
for the contextual interpretation of the clause.

6. <u>Clefts</u>

     Givón [1979] states that it is well known that in cleft constructions
of the world's languages, one element, usually a nominal, is the asserted

focus, while the rest of the material, which often resembles a relative clause, is presupposed (p. 217). These constructions are strong disruptions of the neutral syntax in terms of the presence of the focused constituent at the beginning of the clause as well as the presence of a focus-marking morpheme and relative clause morphology and syntax (p. 78).

Hetzron [1971] classifies clefts as emphatic constructions. He calls emphasis "the phenomenon where all but one (of the) components of a sentence are known to be combined together within the proposition in terms of a presupposition, and the emphasized element is filling the only slot left open in the previous knowledge" (p. 84).

It should be noted that the description of cleft constructions as being composed of an asserted NP and a presupposed relative clause is not based on any specific discourse studies of conversational or written data. Rather, it is the result of typological observations which capture the logico-semantic structure of the cleft construction as it exists in the languages of the world. When Prince [1978] examined clefts in spoken and written English, she found instances of clefts in which the focused NP represents new information and the *that*-clause represents old or known information, i.e. information which can be described as presupposed given the prior discourse. In addition, however, she found clefts in which the information in the logically presupposed *that*-clause constitutes new information in the discourse. She labeled these clefts "informative-presupposition clefts". These informative-presupposition clefts have a general function of presenting statements as facts, as well as a number of various sub-functions. In conversation, then, the NP which is asserted on the logico-semantic level may be given in the discourse, and the information represented in the relative clause, which is presupposed on the logico-semantic level, may be new information in the discourse. During the elicitation of the following cleft examples, however, the consultant was always given a context in which the asserted NP would constitute new information and the presupposed relative clause would represent given or known information.

In Bondei, clefts are formed with the general copula ni and the em-

phatic particle ne . A relative clause serves to restrict the clefted NP, which is new or previously inactive information. The relative clause presents given or already activated information. The NP is in preverbal position with regard to the verb of the relative clause.

6.1. Subject clefts. In examples (45) and (46) the already activated information is that someone or something fell or is falling. The new information consists of the identity of the entity which fell or is falling. There are, of course, no object pronouns in these examples.

(45) ni mvyie ne mwe-ku-gwa
      COP woman EMP 3Ps REL-INF-fall down

      'it's a woman who fell down'

(46) ni kiti ne ki-gwa-cho
      COP chair EMP #7-fall down-REL

      'it's a chair that is falling down'

6.2. Object clefts. In example (47), the already activated information is that the speaker wants something, and the new information is that what she wants is a child. In example (48), the already activated information is that something was eaten, and the new information is that what was eaten was a banana. There is no object pronoun in these examples.

(47) ni mwana ne ni-kunda-e
      COP child EMP 1Ps-want-REL

      'it's a child that I want'

(48) ni tonte ne n-e-ku-da-do
      COP banana EMP 1Ps-PAST-INF-eat-REL

      'it's a banana that I ate'

The object pronoun cannot appear without changing the interpretation of the cleft. When the object pronoun appears, the NP must be interpreted as definite. The definiteness of the NP forces a contrastive interpretation, as in example (49).

(49) ni tonte ne n-e-ku-di-da-do
      COP banana EMP 1Ps-PAST-INF-OP-eat-REL

      'it's the banana that I ate'

Hetzron [1971] calls contrast

"another type of stressing element, with a primarily corrective func-
tion: to replace an element wrongly used in a previous utterance, or
to show additional elements which may appear in exactly the same slot,
surrounded by the same elements. Thus, a contrastive element always
replaces another concrete one, or several of them,—which is not the
case for emphasis" (p. 34).

Chafe [1976] discusses three factors which are involved in contrastive-
ness: shared background knowledge, a set of possible candidates, and the
assertion of the correct candidate. He calls the asserted alternative the
focus of contrast. In this paper, it is assumed that simple focus and con-
trastive focus are distinct functions.

In example (49), the banana is understood as being one member of a set
of possible edibles which was, in fact, eaten, while the others were not
eaten. Thus, the already activated information is that something was eaten.
The cleft conveys the new information that "what was eaten was the banana as
opposed to the other possible edibles, e.g. the mango and the papaya." The
new information is not the identity of the banana per se, but the relation
"the banana and not the other possibilities." The assertion of the banana
is serving a corrective function.

Note that the object pronoun cannot serve as an anaphor in clefts, as
demonstrated in example (50).

(50) *ni ne n-e-ku-di-da-do
       COP EMP 1Ps-PAST-INF-OM-eat-REL

      'it's it which I ate'

Pronouns can be focused, but not with the cleft construction, as in examples
(51) and (52). In these examples, the pronoun is focused with the emphatic
particle ne .

(51) mie   ne mwe-ku-da-e   tonte
      1Ps Pro EMP 1Ps REL-INF-eat-REL banana

      'I'm the one who { is eating / ate / will eat } the banana'

(52) mie   ne amba-e nkina-n-id-e
      1Ps PRO EMP say-REL NEG 1Ps FUT-1Ps-eat-SUBJUNC

      'I'm the one who won't eat'

The emphatic particle ne can also focus lexical NP's in other than cleft constructions. Example (54), with the particle ne , is the focused counterpart of example (53).

(53) wana   we-se-o-ku-da
      children 3Pp-NEG-REL-INF-eat

      'the children who are not eating'

(54) wana   ne we-se-o-ku-da
      children EMP 3Ps-NEG-REL-INF-eat

      'those are the children who are not eating'

While these ne examples resemble clefts in that the verb must take relative morphology, they differ in that there is no copula. It is not clear how ne constructions and clefts differ with regard to their meaning or discourse function. A satisfactory answer to this question would require an examination of both clefts and ne constructions in Bondei discourse.

In cleft constructions, the relativizing morphology must agree with the clefted NP, as demonstrated in example (47) repeated here as (55). This is not the case for pseudo-clefts, as will be seen below (p. 13). In the case of pseudo-clefts, the relative morphology can agree either with the noun class of the focused NP or with the general concept "the thing".

(55) ni mwana ne ni-kunda- $\left\{ {e \atop *cho} \right\}$ 'it's a child that I want'

      COP child EMP 1Ps-want-REL $\left\{ {\#1 \atop \#7} \right\}$

6.3. The relation of the object pronoun, definiteness, and contrastive focus in clefts. In summary, I have shown that the appearance of the object pronoun in clefts forces a definite interpretation of the focused NP. The definiteness of the NP precludes a simple focus interpretation of the cleft, since the definiteness of the NP forces a contrastive interpretation. When no object pronoun appears, however, the focused NP is interpretable as indefinite. A contrastive focus is not forced; the cleft can receive a simple

focus interpretation. Because of these relations between the presence or absence of the object pronoun and the definite or indefinite interpretation of the clefted NP, there exists a correlation between the presence of the object pronoun and contrastive function in clefts.   This is not to say that the object pronoun marks contrastive function. The relation between the presence of the object pronoun and contrastive function is mediated by the definiteness of the NP.

7. <u>Pseudo-clefts</u>. Pseudo-cleft constructions are formed by a relative clause, the general copula ni , and an NP. The relative clause constitutes the given or already activated information, while the NP which follows the copula constitutes the new information. The NP is in postverbal position with regard to the verb of the relative clause.

Hetzron [1971] classifies the pseudo-cleft as a presentative construction. He says,

> "... at issue is not the novelty of the element, but what the speaker intends to build up in the discourse. ... The element which is meant to represent a special contrast to all possible other elements susceptible to appear in the same slot, i.e., the element whose individual and specific presence is the most important in the sentence, comes last" (p. 79).

Presentative constructions serve a cataphoric function. The element they present will be relevant in the subsequent discourse.

7.1. <u>Subject pseudo-clefts</u>. In Bondei, pseudo-clefts differ from clefts in that the relative morphology can agree either with the noun class of the pseudo-clefted NP or with the general concept "the thing". Examples (56) and (57) exhibit the two possible agreements for pseudo-clefted subject NP's.

(56) che-ku-bonda-cho   tindi   ni mpeho
      #7 PAST-INF-break-REL #7 banana plant COP wind

      'what broke the banana plant is the wind'

(57) ye-ku-bonda-yo   tinde   ni mpeho
      #9 PAST-INF-break-REL #9 banana plant COP wind

      'what broke the banana plant is the wind' (not the rain, not the hail)

In example (56), the subject pronoun and the relative suffix agree with
the noun class of the "what", i.e. the concept of "the thing". This agree-
ment gives no information about the pseudo-clefted NP. In example (57), the
subject pronoun and the relative suffix agree with the noun class of mpeho
'wind'. This agreement, therefore, is cataphoric and points ahead to the
specific pseudo-clefted NP by identifying its noun class.

The use of the specific noun class agreement morphology necessitates a
different interpretation of the pseudo-cleft from the more general class #7
agreement. The pseudo-cleft with specific noun class morphology signals a
contrastive meaning. In example (56), the presupposition is that something
broke the banana plant, and the new information is that it was the wind. In
example (57), the presupposition is that it was one of a set of known possi-
bilitites which broke the banana plant. The new information is that "it was
the wind and not the other possibilitites (the rain, the hail) which broke
the banana plant."

7.2. Object pseudo-clefts. Object pseudo-clefts can also take two differ-
ent kinds of relative agreement morphology, as demonstrated in examples (58)
and (59). There is no object pronoun in these examples.

(58)   mvyie a-kunda-cho   ni tonte
       woman 3Ps PRES-want-REL #7 COP banana

       'what the woman wants is a banana'

(59)   mvyie a-kunda-do   ni tonte
       woman 3Ps PRES-want-REL #5 COP banana

       'what the woman wants is the banana'

These two forms force different interpretations. In example (58), the
presupposition is that the woman wants something, and the new information
is that what she wants is a banana. In example (59), the presupposition is
that the woman wants one of a set of known possibilities. The new informa-
tion is that "it is the banana and not the other possibilities which, in
fact, the woman wants."

In examples (60) and (61), a pronoun which refers to a human referent
is clefted.

(60) ni-onda-cho   ni   wewe
     1Ps-want-REL #7 COP 2Ps

     'what I want is you'

(61) ni-onda-ye   ni   wewe
     1Ps-want-REL #1 COP 2Ps

     'what I want is you', 'the one I want is you' (not him, not her)

The presence of a human referent in these examples clearly demonstrates the difference in the information activated by the different morphology on the verbs. In (60) the cho gives no information about what is wanted, since it agrees with the general concept 'the thing'. In (61) the ye signals that what is wanted belongs to noun class #1, which consists of nouns that are human or divine. Thus, the set of possibilities has been delineated by the relative morphology, and a contrastive interpretation is forced.

7.3. The object pronoun in pseudo-clefts. The object pronoun cannot appear in a pseudo-cleft which has only class #7 concord, as demonstrated in example (62).

(62) mvyie a- $\left\{ \begin{matrix} \emptyset- \\ *m- \end{matrix} \right\}$ kunda-cho   ni   mwana
     woman 3Ps PRES-want-REL #7 COP child

     'what the woman wants is a child'

When this class #7 agreement is used, no information is given by the relative morphology about the identity of the NP which follows the relative clause. This type of pseudo-cleft cannot have a contrastive interpretation Hence, it cannot focus an NP which is interpreted as definite, since definite NP's require a contrastive interpretation.

    In contrast, the object pronoun can appear in pseudo-clefts which have the specific noun class morphology of the focused NP. The morphology of the specific noun class agreement provides some information about the noun. The NP is, in some sense, semi-active in this type of pseudo-cleft. The relative morphology serves as a cataphoric reference, invoking the semantic associations which accrue to the noun class to which the NP belongs. The following example with specific noun class morphology does not have an ob-

ject pronoun.

(63)   mvyie a-∅-kunda-e   ni mwana
        woman 3Ps PRES-OP-want-REL #1 COP child

   a.   'what the woman wants is (to have) a child' (as opposed to a career)

   b.   'what the woman wants is the child' (as opposed to the house, in the
        context of a divorce)'

Example (63) demonstrates that the specific noun class morphology forces a
contrastive interpretation independently of the presence of the object pro-
noun. The NP need not be interpreted as definite, as in (a), as long as the
contrastive sense can be maintained.

     When the object pronoun appears with the specific noun class morphology,
however, the NP must be interpreted as definite, as demonstrated in the fol-
lowing example.

(64)   mvyie a-m-kunda-e   ni mwana
        woman 3Ps PRES-OP-want-REL #1 COP child

        'what the woman wants is $\left\{ \begin{matrix} \text{the child} \\ \text{*a child} \end{matrix} \right\}$'

     In summary, the two possibilities for marking the noun class of focused
NP's in the relative clause of pseudo-clefts correlate with the function of
contrastiveness. Pseudo-clefts which take the general class #7 agreement
morphology cannot function to contrast the focused NP. Consequently, the
object pronoun is restricted from appearing in this syntactic environment
since the appearance of the object pronoun in clefts or pseudo-clefts corre-
lates with definiteness, and focusing a definite NP forces a contrastive in-
terpretation. Pseudo-clefts which take the specific noun class morphology
must be interpreted as contrastive (ex. 63). The object pronoun can appear
in this syntactic environment, but when it does the NP must be interpreted
as definite. The object pronoun in this construction correlates with defi-
niteness, and definiteness requires a contrastive interpretation. The cor-
relation, however, is not symmetrical. A contrastive interpretation of
pseudo-clefts is possible without the presence of the object pronoun. The
NP may be interpreted as definite or indefinite.

8. Conclusion

In this paper I have shown that the object pronoun in Bondei can appear in a wide range of syntactic environments. It can serve as an anaphor for previously mentioned NP's. It can mark left-dislocated NP's. It can appear with given and new postverbal NP's. It appears freely in relative clauses. It can appear in declarative and relative clauses without necessarily changing their meaning, i.e. without necessarily definitizing their objects.

When the object pronoun appears in the relative clause of a cleft, however, it definitizes the clefted NP. In other words, the presence of the object pronoun precludes an indefinite interpretation of the clefted NP. Thus, depending upon whether or not the object pronoun is present or absent in the cleft, the NP will be interpreted as definite or indefinite.

The definiteness of the clefted NP forces a contrastive meaning of the cleft. Thus, on the basis of the meaning change which the presence of the object pronoun effects (definite vs. indefinite), we can say that while new, indefinite NP's can be focused by cleft constructions without the syntactic category object pronoun, definite NP's can only be given contrastive focus. Focus and contrastive focus are distinct functions. In cleft constructions, the presence of the object pronoun signals a definite interpretation of the NP which, in turn, forces a contrastive function. In both the case of simple focus and contrastive focus, however, some new information is being communicated, either the identity of the referent or the contrastive relation.

The object pronoun can only appear in one of two possible pseudo-cleft constructions. It can appear in the relative clause of a pseudo-cleft which takes specific noun class concord. This morphology itself serves to require a contrastive interpretation for the NP which is being focused. The object pronoun in this construction forces a definite interpretation of the NP. The definiteness of the NP does not force a contrastive interpretation; it is, however, compatible with the contrastive interpretation signaled by the verb morphology.

In contrast to these two constructions, the object pronoun cannot appear in the relative clause of a pseudo-cleft which takes general class #7 concord. This construction cannot have a contrastive meaning. Thus, definite

pseudo-clefted NP's are not compatible with this construction, since defi-
niteness forces a contrastive interpretation. Since it is the presence of
the object pronoun which forces a definite interpretation of the pseudo-
clefted NP, the object pronoun cannot appear in this type of pseudo-cleft.
The two types of pseudo-clefts differ with regard to their interpretations,
noncontrastive vs. contrastive. On the basis of this meaning difference,
we can say that new, indefinite NP's are presented in class #7 pseudo-clefts
which appear without the object pronoun.

The following facts may be stated for the interpretation of contrast in
clefts:

(1)   the presence of the object pronoun in clefts requires a definite
      interpretation of the NP;

(2)   the presence of a definite NP in a cleft construction forces a con-
      trastive interpretation.

It is also possible that a cleft with an indefinite NP can receive a
contrastive interpretation, given the appropriate context. This question
must be left open, however, because a satisfactory answer can only be given
after an examination of actual examples from Bondei discourse. That, how-
ever, is beyond the scope of this paper.

The following facts may be stated with respect to the interpretation of
contrast in pseudo-clefts:

(1)   specific noun class pseudo-clefts force a contrastive interpreta-
      tion independently of the presence or absence of the object pro-
      noun; moreover, this contrastive interpretation is possible with
      an indefinite interpretation of the NP;

(2)   the presence of the object pronoun in specific noun class pseudo-
      clefts requires a definite interpretation of the NP;

(3)   class #7 pseudo-clefts do not permit a contrastive interpretation.

The relation between focus, contrastive focus, and definiteness may be rep-
resented as in the diagram opposite. In clefts, the object pronoun corre-
lates with definiteness which, in turn, correlates with contrastive func-
tion. The relation between the object pronoun and contrastive function is
mediated by definiteness.

Cleft

```
            |
   ┌────────┴────────┐
( + OM )          ( - OM )
   |                  |
 (+DEF)            (-DEF)
   |                  |
┌──────────┐    ┌──────────┐
│+ Contrast│    │- Contrast│
└──────────┘    └──────────┘
```

P-cleft spec.

```
            |
   ┌────────┴────────┐
( + OM )          ( - OM )
   |                  |
 (+DEF)           (+/- DEF)
   └────────┬────────┘
      ┌──────────┐
      │+ Contrast│
      └──────────┘
```

P-cleft #7

```
            |
   ┌────────┴────────┐
(  *  )           ( - OM )
                      |
                   (-DEF)
                      |
                ┌──────────┐
                │- Contrast│
                └──────────┘
```
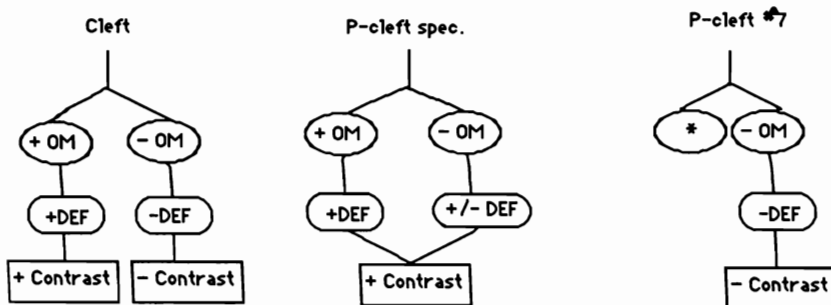
   In pseudo clefts, a different relation exists. Noun class morphology
correlates with contrastive function. Class #7 pseudo-clefts correlate
with noncontrast, while specific noun class pseudo-clefts correlate with
contrast for both definite and indefinite NP's. In specific noun class
pseudo-clefts, the object pronoun correlates with definiteness. The con-
trastive interpretation which the definiteness of the NP forces is compati-
ble with the contrastive interpretation signaled by the verb morphology.

Appendix

The following surface forms are examples of the possible forms the subject
pronoun can take in combination with tense/aspect and polarity morphemes.

	Singular	Plural
1P Pres	na	ta
1P Pres-Neg	nkí	ṅka
1P Past/Perf	nkí	ti
1P Continuous Past	ní	ti
1P Past-Neg	nce	nkate
1P Rel	mwe	we
2P Pres	wa	mwa
2P Pres-Neg	nku	nka
2P Past/Perf	ku	m
2P Continuous Past	u	m
2P Past-Neg	nkwe	nkamwe
3P Pres	a	wa
3P Pres-Neg	nka	nka
3P Past/Perf	ka	wa
3P 1Ps Continuous Past	a	wa
3P Past-Neg	nke	nkawe
3P Rel	mwe	we

Noun classes take secondary concord.

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