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TONE IN THE MAKONDE DIALECTS: CHIMAHUTA*

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This paper expands the descriptive study of tone in the Makonde dialects, started in Odden [1990], by studying the Chimahuta dialect. Like the Chimaraba dialect and a number of closely related Bantu languages of Southern Tanzania, Chimahuta verbs lack lexical tone properties, and all tones appearing on the surface in verbs arise as a consequence of rules of tone insertion, docking, spreading, and deletion.

1. Introduction

The first paper in this series [Odden 1990] presents an account of tone in the Chimaraba dialect of Makonde. The present paper continues the analysis of Makonde by sketching the tonal grammar of the Chimahuta dialect. We will discover that the Chimahuta dialect uses the same fundamental tonal rules and representations as the Chimaraba dialect, with some interesting areas of divergence. There are various lexical, segmental and morphological differences between the dialects, and not surprisingly, tonal differences. §2 lays out the tonology of the verb, and §3 discusses sentence-level tonology in this dialect.

We begin with a summary of the earlier analysis of Chimaraba given in Odden [1990], focusing on the features in common between the dialects, which will form the foundation for the present analysis of Chimahuta. First, it was shown that the final syllable of every word is extraprosodic, and with the exception of a single tense, rules never assign tone to, or even see, the final syllable at the word-level. Stress and noncontrastive (but linguistically significant) vowel length are

* An earlier version of this paper was presented at the 20th African Linguistics Conference at the University of Illinois in April 1989. Data for this paper was gathered at the University of Dar es Salaam in Summer 1988 primarily from Weston Hamisi, with the support of the University of Dar es Salaam and a Fulbright grant.

automatically assigned to the penultimate syllable of all words. The following rule assigns a second mora to stressed syllables.

(1) **Stress Lengthening**

$$\begin{array}{c} [+stress] \\ \sigma \\ | \\ | \\ \emptyset \rightarrow \mu \end{array}$$

Only the stress of the last word in an utterance is phonetically realized in connected speech, so we assume that medial stresses are either severely reduced or eliminated altogether.

Verbs have no lexical tone contrasts, and any tones appearing at the surface are assigned by rule. Every verb stem is assigned a single floating H tone by a rule which occurs in both of the dialects surveyed as well as in a number of related Bantu languages (Kimatuumbi, Yao, Kikuria).

(2) **Stem H Insertion**

$$\emptyset \rightarrow H / [STEM_]$$

The stem H is then mapped to the penultimate syllable by one of three rules. Two of these rules, Stem Mapping and Future Negative Mapping, are morphologically conditioned and only apply in specified tenses. These two rules apply prior to the addition of the second mora to the stressed penult, so that the H mapped to the penultimate syllable by these rules will surface as a falling tone. An example in Chimaraba is *vakateleéka* 'if they cook'. The third tone docking rule, Default Docking, assigns any remaining free H's to the penultimate, but that rule applies after stress-induced lengthening, hence we find a rising tone on the surface, viz. *tunateleéka* 'we will cook'.

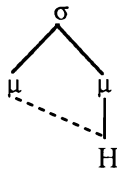
A second H tone, which originates from within the verbal prefixes, may appear at the left edge of the verb stem. Certain prefixes, such as the far past prefix *ní*, have a H tone, which shifts under the right conditions to the left edge of the verb stem by the rule Shift to Stem. By this shift, *nní* [*chiteleéka* becomes *nnichíteleéka* 'I cooked it'. The shifted stem-initial H tone may then undergo Tone Doubling, so intermediate *nniváfukuziíla* (from *nní vafukuziíla* by Shift to Stem) surfaces as *nniváfúkuziíla* 'I chased them'. Whenever two adjacent syllables bear H tones, the second loses its H tone by Meeussen's Rule, so underlying *análiíma* becomes *análiima* 'he will cultivate'. Finally, subject to morphological restrictions, a H spreads maximally rightward by the rule Rightward

Spreading, providing there is a following H, whereby underlying *kutélekelaána* becomes *kutélékéláána* ‘to cook for each other’.

At the sentence level, we find that certain verb tenses assign a H tone to the leftmost syllable of the following noun, providing there is a H tone after the verb. This H then spreads by Rightward Shift, so *niyumite ´ chikalaángo* becomes *niyumite chíkálaángo* ‘I bought a vegetable pot’. Certain nominal constructions (possessives and WH-modifiers) cause deletion of H tones in nouns, and others add H tones to toneless nouns: all of these tone insertion and deletion rules interact transparently with the rule assigning H to nouns after verbs. Nouns which become toneless due to their nominal construction reject the verbal H tone, just as lexically H toned nouns do. Similarly, nouns which are lexically toneless but which get a H due to their construction act just like nouns with an underlying H tone, taking a H from the verb.

Much of this analysis given to the Chimaraba dialect also holds for the Chimahuta dialect, but there are significant differences between the dialects. The first surface difference between the dialects is that the Chimahuta dialect has no contrast between rising tone and level H. Phonetically, the only opposition is between fall and H. This is due to a late rule, (3), spreading H leftward within the syllable.

(3) Leftward Spreading



In the course of the analysis, we will find ample motivation for assuming that a level penultimate tone derives from a more abstract rise.

2. Verb Tense

2.1. Stem tone assignment. The first tenses we will consider are those motivating Default Docking (6). If we look at examples of the future tense with 1 and 2 person subjects, we find that the patterns are identical in the two dialects, with the exception that where Chimaraba has a rising tone, Chimahuta has a phonetic level H.

(4) Chimahuta

nnaa [lɪyɑ]

‘I will eat’

<i>nna</i> [<i>shóóna</i>	‘I will sew’
<i>una</i> [<i>telééka</i>	‘you will cook’
<i>nna</i> [<i>pindikúúla</i>	‘I will change’
<i>tuna</i> [<i>kalangiláána</i>	‘we will fry for e.o.’
<i>tuna</i> [<i>va + lóóla</i>	‘we will watch them’
<i>nna</i> [<i>ku + limííla</i>	‘I will dig for you’
<i>tuna</i> [<i>ku + telekééla</i>	‘we will cook for you’

Chimaraba

<i>nnaa</i> [<i>lya</i>	‘I will eat’
<i>nna</i> [<i>shoóna</i>	‘I will sew’
<i>una</i> [<i>teleéka</i>	‘you will cook’
<i>una</i> [<i>chi + teleéka</i>	‘we will cook it’

Another context where Default Docking applies in Chimahuta is in the formation of instrument nominalizations.

(5) <i>chisuguliílo</i>	‘thing for washing clothes with’
<i>chitelekeélo</i>	‘thing for cooking with’
<i>chicheketeélo</i>	‘thing for cutting with’

A different tone pattern is found for the instrument nominalization in Chimaraba: there is a single H stretching from the stem-initial syllable to the penult, terminating in a falling tone, as in *chitélékéelo*. There are two differences between the dialects in the tone pattern of this nominalization. In Chimahuta, there is only one H tone, but in Chimaraba, there is also a floating pre-stem H. Additionally, the instrument nominalization is one of the categories triggering Stem Mapping in Chimaraba (hence the falling tone), whereas in Chimahuta the instrument nominalization is not a category triggering Stem Mapping. However, the Default Docking rule applies to any H not docked by an earlier rule. The form of Default Docking is thus identical in the two dialects, even though the class of forms to which the rule applies may differ between the dialects.

As noted earlier, Default Docking applies after Stress Lengthening, so that we do not derive a falling tone. The surface level H tone of *nnashóóna* (rather than a rising tone) is the result of Leftward Spreading (3).

(6) Default Docking

H´
|
|
μ]

The underlying form is *nnashoona*, with no tones. A stem H is inserted by Stem H Insertion (2), and the final syllable is rendered extratonal. The syllable *sho* is lengthened, since it is stressed, yielding intermediate *nnashoo(na)´*. This form then undergoes Default Docking, followed by Leftward Spreading (3), resulting in the surface form *nnashóóna*.

In the (positive) conditional seen in (7), there is a single falling tone on the penultimate syllable. Again, this is the same pattern as was encountered in Chimaraba, and it arises by application of Stem Mapping (9).

(7) Chimahuta

<i>káma vakáa</i> [<i>lya</i>	‘if he eats’
<i>káma aka</i> [<i>shóona</i>	‘if he sews’
<i>káma aka</i> [<i>la + líima</i>	‘if he cultivates them’
<i>káma vaka</i> [<i>panyáana</i>	‘if they beat e.o.’
<i>káma vaka</i> [<i>ngu + limíila</i>	‘if they cultivate for me’
<i>káma tuka</i> [<i>telekeláana</i>	‘if we cook for e.o.’

Chimaraba

<i>nikáa</i> [<i>lya</i>	‘if I eat’
<i>aka</i> [<i>líima</i>	‘if he cultivates’
<i>nika</i> [<i>va + limíila</i>	‘if I cultivate for them’

The remote past perfective relative clause verb tense also undergoes this mapping rule.

(8) <i>inyáma inna</i> [<i>líile</i>	‘the meat which I ate’
<i>wélu unna</i> [<i>kw + ing’ íile</i>	‘the field which I gave you’
<i>wélu unna</i> [<i>va + limidiile</i>	‘the field which I cultivated for them’
<i>inyáma ituna</i> [<i>telekéene</i>	‘the meat which we cooked’

A number of other tenses undergo Stem Mapping, but also select a secondary stem-initial H tone which obscures the tone pattern. These tenses will be discussed below. We will account for the falling tone pattern with the following rule:

- (9) **Stem Mapping** (applies in: conditional
subordinate tenses
subjunctive+OP)
- $$\begin{array}{c} H' \\ | \\ | \\ \mu] \end{array}$$

Stem Mapping applies to *káma vakapanya(na)´* to give *káma vakapanyána*, which later undergoes Stress Lengthening, creating the contrast between fall and level H on the penultimate syllable. Chimahuta has no analog to the future negative tense of Chimaraba, so the Future Negative Mapping rule required for Chimaraba will not be required in this dialect.

2.2. Doubling, Meeussen's Rule, and Shift to Stem. We now return to the future tense, selecting a 3 person subject prefix. This is a tense where Default Docking applies to the stem H, giving a level H tone. The subject prefix also has a H tone, which shifts by an early rule to the tense prefix *na*, and then shifts to the stem initial syllable in the correct circumstances.¹ The parallelism between dialects is maintained when we look at the relatively long verb roots in (10), which have no object prefix. There is a H on the root initial syllable, which doubles to the following syllable, and there is a level H on the penultimate assigned by Default Docking.

(10) **Chimahuta**

- | | |
|--|----------------------------------|
| <i>ana</i> [<i>píndíkulapindikúúla</i> | ‘he will turn repeatedly’ |
| <i>vana</i> [<i>súkúmiláána</i> | ‘they will push for each other’ |
| (Chimaraba: <i>vana</i> [<i>télékelaána</i> | ‘they will cook for each other’) |

The form *vanasúkúmiláána* derives from *vanasúkumiláána* (ultimately from *vánasukumiláána*). We rarely encounter a single H tone not followed by another H, except in the last two syllables of the word where the final syllable is extraprosodic, so we need a Doubling rule in Chimahuta, as we did in Chimaraba. We also notice in (11) that when there is an object prefix on the verb, the object prefix (which is in stem initial position) has the first H as expected, but there is no tone doubling between the object prefix and the root.

¹Details of Shift to Stem will be considered in this section. We will see that the dialects do differ in this rule.

(11) **Chimahuta**

<i>ana</i> [<i>tú + valangíila</i>	‘he will count for us’
<i>vana</i> [<i>ngú + telekééla</i>	‘they will cook for me’
(Chimaraba: <i>vana</i> [<i>ní + kálangíila</i>	‘they will fry for me’)

In Chimahuta, we must constrain Doubling so that it does not apply between the object prefix and the root syllable. This can be accomplished by restricting the leftmost syllable in the relevant syllable pair morphologically. The determinant cannot be [+OP] (see (16)).

We found that in Chimaraba, Doubling is blocked if the syllable which follows the potential recipient happens to have a H. Hence, Doubling cannot create adjacent H toned syllables. This constraint is lacking in Chimahuta, so Doubling does apply to the four-syllable roots of (12), bringing together the root initial H and the penultimate H. Meeussen's Rule deletes the second of two syllabically adjacent H tones (whether or not the moras which bear the H's are adjacent), so the penultimate H is deleted.

(12) <i>vana</i> [<i>píndíkuula</i>	‘they will change’
<i>vana</i> [<i>líμίlaana</i>	‘they will cultivate for each other’
<i>vana</i> [<i>píndikuúla</i>	output of initial mapping rules
<i>vana</i> [<i>píndíkuúla</i>	Doubling
<i>vana</i> [<i>píndíkuula</i>	Meeussen's Rule

These forms contrast with the Chimaraba form *vana* [*líμίlaána*, where Doubling was blocked by the presence of a following H.

There being no further complications to consider in the form of Meeussen's Rule, we will state that rule formally at this point.

(13) **Meeussen's Rule**

H → Ø/H__

However, more must be said about Doubling.

Since Doubling can bring H's together to make Meeussen's Rule applicable, Doubling obviously precedes Meeussen's Rule. This raises a question about how we get the right tone in trisyllabic stems, that is, no penultimate H at all.

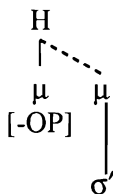
- (14) *ana* [*téleeka* 'he will cook'
vana [*tú + oona* 'they will see us'
ana [*shóneela* 'he will sew for'

Consider the incorrect derivation for *anatéleeka* in (15), where we apply the rules in the correct order and derive a penultimate falling tone (**anatéléeka*).

- (15) H H
 | |
 anateleeka **Shift to Stem**
- H H
 ↘ |
 anateleeka **Doubling**
- H
 ↘
 anateleeka* **Meeussen's Rule

In this derivation, Doubling spreads the first H to the leftmost mora of the penult, and Meeussen's Rule then deletes the following H (within the syllable). This would derive a falling tone on the penultimate syllable, whereas we actually have no H on the penultimate syllable. The solution to this problem is to impose the correct constraint on Doubling: in Chimahuta, Doubling is constrained by H tones—H cannot spread to a syllable that already has H. The final version of Doubling for this dialect is (16).²

- (16) Tone Doubling



²As noted in Odden [1990], the expression σ' is a formal anomaly. On the assumption that tones link to the mora, all syllables are literally "toneless", that is, not linked to a tone. This expression must therefore be taken to mean "a syllable which does not dominate any mora which is linked to a tone".

The requirement that the focal mora must be in a toneless syllable also explains why Doubling does not apply strictly within the syllable, for example, in *káma akashóona* ‘if he sews’, to derive **káma akashóona*.

To find further examples of the blockage of Doubling to H toned syllables and of the application of Meussen's Rule to the output of Doubling, we consider the recent past tense in (17). The data, hence the analysis, for both dialects are the same (excluding the low-level rise versus level H difference) in relatively long verb stems, where blockage of Doubling by H is not relevant.

(17) **Chimahuta**

<i>ání</i> [<i>tu + pilikanííla</i>	‘he listened to us’
<i>ání</i> [<i>li + sukúúma</i>	‘he pushed it’
<i>túní</i> [<i>va + hééka</i>	‘we laughed at them’
<i>túní</i> [<i>telééka</i>	‘we cooked’
<i>túní</i> [<i>pindikúúla</i>	‘we changed’
(Chimaraba: <i>vání</i> [<i>ni + telekeéla</i>	‘they cooked for me’)

The dialects diverge in the treatment of disyllabic stems. In the Chimaraba dialect, Doubling was blocked by the penultimate H. In Chimahuta, there is no such blockage, so Doubling does apply and results in a structure which undergoes Meeussen's Rule.

(18) **Chimahuta**

<i>ání</i> [<i>chii + lya</i>	‘he ate it’
<i>túní</i> [<i>liima</i>	‘we cultivated’
<i>ánii</i> [<i>lya</i>	‘he ate’

Chimaraba

<i>ánichiílya</i>	‘he ate it’
<i>túniliíma</i>	‘we cultivated’

The form *ániilya* illustrates the fact that Doubling does not apply *to*, i.e. strictly within, a H toned syllable, though it applies *before* a H toned syllable. This form also undergoes Meeussen's Rule.

(19) H H
| |*a nii lya***Output of docking rules**

NA

Doubling

H

|

a nii Iya

Meeussen's Rule

Chimahuta possesses a past progressive tense not found in Chimaraba, constructed with the prefix *na-*, which has the same tone pattern as the recent past tense. The subject prefix has a H tone which doubles to the following syllable, providing that it is toneless (hence Doubling is blocked in *vánaaIya*, which derives from *vánaáIya* by Meeussen's Rule). The penultimate syllable has a level H deriving from Default Docking, and that H will be deleted by Meeussen's Rule if it is preceded by a H, as in *ánaheeka*.

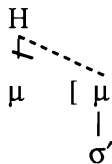
- | | |
|--------------------------------------|----------------------------------|
| (20) <i>vánaa</i> [<i>Iya</i> | 'they were eating' |
| <i>ńná</i> [<i>laa + Iya</i> | 'I was eating them' |
| <i>ána</i> [<i>heeka</i> | 'he was laughing' |
| <i>túna</i> [<i>i + chekééta</i> | 'we were cutting it' |
| <i>vána</i> [<i>telekeláána</i> | 'we were cooking for each other' |
| <i>vána</i> [<i>ngu + telekééla</i> | 'they were cooking for me' |

We discovered in the study of Chimaraba that the stem-initial H tone of the future and the remote past arrives in its stem-initial position by shifting from the prefixes *ni-* and *na-*. The Shift to Stem rule in Chimahuta is slightly different. The examples in (21) show that the H on the pre-stem prefix shifts to the stem initial vowel only if the stem-initial syllable is underlyingly toneless.

- | | |
|---------------------------------|----------------------|
| (21) <i>anáa</i> [<i>Iya</i> | 'he will eat' |
| <i>aná</i> [<i>shoona</i> | 'he will sew' |
| <i>aná</i> [<i>chii + Iya</i> | 'he will eat it' |
| <i>ana</i> [<i>tú + loola</i> | 'he will see us' |
| <i>ana</i> [<i>téleeka</i> | 'he will cook' |
| <i>anii</i> [<i>Iya</i> | 'he ate' |
| <i>vaná</i> [<i>liima</i> | 'they cultivated' |
| <i>nní</i> [<i>vii + Iya</i> | 'I ate them' |
| <i>tuni</i> [<i>vá + heeka</i> | 'we laughed at them' |
| <i>ani</i> [<i>téleeka</i> | 'he cooked' |

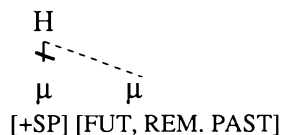
These examples are similar to what we encounter in Chimaraba, except when it comes to monosyllabic verbs with an object prefix. Where Chimahuta has *anáchiilya*, Chimaraba has *anachiilya*. The difference is quite simply that in the present dialect, the syllable which takes the shifted H tone must be toneless, regardless of whether that syllable is in an object prefix or a root. In Chimaraba, a H toned object prefix syllable could take the shifted H, where a H toned root syllable could not. The tone conditions in Chimahuta are thus uniform for both morphological conditions.

(22) **Shift to Stem**



Finally, we account for the H tone which stands on the tense-aspect prefix in the future with 3 person subject by shifting that H from the subject prefix syllable to the tense prefix by the following rule. We will also apply this rule in the remote past (*aníchiilya*), where subject prefixes are uniformly H-toned. The sole difference between the remote past and the recent past (*áníchiilya*) is the application of Shift to Prefix in the remote past.

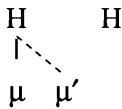
(23) **Shift to Prefix**



The form *anitéleeka* derives from *ániteleéka* as follows. First, Shift to Prefix gives *anitéleéka*. This undergoes Shift to Stem, resulting in *anitéleéka*. Doubling is blocked (since *leé* has a H tone), so Meeussen's Rule applies, giving the surface form.

2.3. Rightward Spreading and Meeussen's Rule. Rightward Spreading is the rule whereby a H at the left edge of a verb spreads maximally rightward to the penultimate H (which was assigned by Default Docking or Stem Mapping).

(24) Rightward Spreading



This rule will apply, *inter alia*, in the infinitive if there is no object prefix. An interesting difference between the dialects is that in Chimahuta, Meeussen's Rule applies to the output of Rightward Spreading (Meeussen's Rule is fed by Rightward Spreading), whereas in Chimaraba, Rightward Spreading counterfeeds Meeussen's Rule. We will consider one of the examples of this interaction here. The infinitive undergoes the rule Default Docking, and when an object prefix is present, Rightward Spreading is morphologically blocked, so the penultimate syllable has a level H tone, as seen in (25). If the object prefix immediately precedes the penult, Meeussen's Rule deletes the penultimate H.

- (25) *ku* [*lá + liima* 'to cultivate them'
 ku [*tú + limííla* 'to cultivate for us'
 ku [*tú + telekééla* 'to cook for us'

But looking at the plain infinitive, we find that Rightward Spreading applies within the stem, and the level penultimate H changes to a falling tone.

- (26) *ku* [*chíima* 'to close'
 ku [*púmúula* 'to breathe'
 ku [*télékéela* 'to cook for'

As the derivation in (27) shows, applying Meeussen's Rule after Rightward Spreading accounts for this change in the penultimate tone.

- (27) H H
 | |
 ku te le kee la output of Default Docking
- H H
 / |
 ku te le kee la Rightward Spreading

**Meeussen's Rule**

The alternation between penultimate level H when there is no Rightward Spreading and penultimate falling tone when there is spreading, can be seen in another tense. In the past progressive “when”-tense, a H tone is optionally assigned to the root initial syllable. When that H is assigned, Rightward Spreading applies, inducing a change in the tone of the penultimate syllable.

(28) a. **No initial H**

<i>paváchíí</i> [<i>lyá</i>	‘when they were eating’
<i>paníchi</i> [<i>súúma</i>	‘when I was buying’
<i>patúchi</i> [<i>telééka</i>	‘when we were cooking’
<i>patúchi</i> [<i>telekeláána</i>	‘when we were cooking for each other’

b. **Optional root initial H**

<i>paníchi</i> [<i>súuma</i>	‘when I was buying’
<i>paváchi</i> [<i>ímbíláana</i>	‘when they were singing for each other’
<i>paváchi</i> [<i>káláanga</i>	‘when they were frying’
<i>páchi</i> [<i>ngu + télékéela</i>	‘when he was cooking for me’
<i>paváchi</i> [<i>píndikúlíláana</i>	‘when they were changing for each other’

The second type of context where Meeussen's Rule applies to the output of Rightward Spreading is when the penult has an underlying falling tone, such as one finds in the conditional. This ultimately will bring us to a further interesting tonal feature of this dialect. The negative conditional is formed by adding a H to the prefix *-ka-* of the affirmative conditional, and spreading that H to the penult. As the data in (29) show, the penultimate syllable has no H. Segmentally, the positive and negative conditional forms are identical.³

(29) <i>káma aká</i> [<i>shoona</i>	‘if he doesn't sew’
<i>káma aká</i> [<i>lá + liima</i>	‘if he doesn't cultivate them’
<i>káma vaká</i> [<i>pányaaana</i>	‘if they don't beat each other’

³The positive and negative conditional of *lyá* are identical—*káma akáalya* ‘if he eats; if he doesn't eat’. In both forms, the stem H is assigned to the prefix *ka-*, and addition of a second H in the negative has no surface effect.

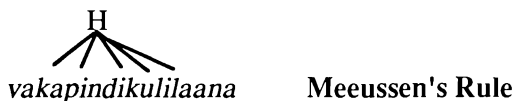
<i>káma vaká</i> [<i>ngú + límiila</i>	‘if they don't cultivate for me’
<i>káma vaká</i> [<i>píndíkúlílaana</i>	‘if they don't change for each other’

This pattern of a prefixal H spreading to the penultimate syllable with an underlying falling tone is encountered in a number of tenses, set out in (30), primarily the negative tenses and the relative clause tenses which in other Bantu languages have complex stem tone patterns.

(30) <i>aká</i> [<i>liima</i>	‘he won't plow’
<i>vaká</i> [<i>tú + heeka</i>	‘he won't laugh at us’
<i>niká</i> [<i>téleeka</i>	‘I won't cook’
<i>tuká</i> [<i>chí + píndíkuula</i>	‘we won't change it’
<i>tuká</i> [<i>píndíkúlílaana</i>	‘we won't change for e.o.’
<i>aká</i> [<i>ngú + télékétélékeela</i>	‘he won't freq. cook for me’
<i>ungúu</i> [<i>lya</i>	‘thing (Cl.14) that I am buying’
<i>chingú</i> [<i>sooma</i>	‘thing (Cl.7) that I am reading’
<i>itú</i> [<i>télékélaana</i>	‘thing (Cl.9) that we cook for e.o.’
<i>díní</i> [<i>kw + iing'a</i>	‘thing (Cl.5) that I give you’
<i>vaní</i> [<i>vá + loola</i>	‘people who I see’
<i>iní</i> [<i>kú + télékeela</i>	‘thing (Cl.9) that I cook for you’
<i>ingú</i> [<i>liile</i>	‘thing (Cl.9) that I ate’
<i>chingú</i> [<i>sómiile</i>	‘thing (Cl.7) that I read’
<i>ingú</i> [<i>súmísiije</i>	‘thing (Cl.4) that I sold’
<i>itú</i> [<i>télékéleene</i>	‘thing (Cl.4) that we cooked for e.o.’
<i>uní</i> [<i>vá + límídiile</i>	‘thing (Cl.3) that I cultivated for them’

The surface pattern found in this class of verb tenses is a H tone beginning with some relatively leftward position before the stem, extending to the antepenultimate syllable. This derives from assigning the stem H to the penult by Stem Mapping (which normally results in a falling tone) and spreading the leftmost H up to the penult by Rightward Spreading. Meeussen's Rule then applies to the output of Rightward Spreading, as the derivation in (31) shows.

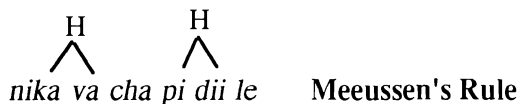
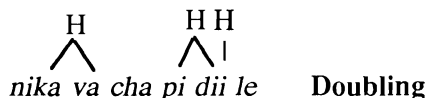
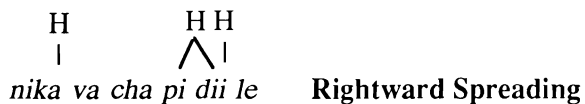
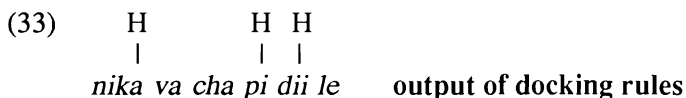
(31)	H	H	
	<i>vakapindikulilaana</i>		initial tone assignment



The last context within verb tenses to consider with respect to Meeussen's Rule is the negative perfective. Here we find, limiting ourselves to longer verbs, that the penultimate syllable has a falling tone. The antepenultimate syllable, but not preceding syllables, has a H. Finally, the prefix *ka* has a H tone, which doubles to the stem-initial syllable.

- (32) *niká* [*vá* + *chapídĩile* 'I didn't cook for them'
niká [*vá* + *telekédĩile* 'I didn't cook for them'
tuká [*pĩndikuliléene* 'we didn't change for each other'
niká [*vá*+ *pĩndikulídĩile* 'I didn't change for them'

This can be explained by postulating a H tone mapped to the penult by Default Docking, and a second H mapped to the antepenultimate. Rightward Spreading then applies, and Meeussen's Rule subsequently deletes the H from the second mora of the penult.



What confirms this analysis is the behavior of shorter verb stems. If the stem contains fewer than five syllables, we find a different pattern. The relevant data are given in (34).

- (34) *niká* [*liile* 'I didn't eat'
niká [*ukííle* 'I didn't leave'
niká [*chi + lííle* 'I didn't eat it'
niká [*lá + telééke* 'I didn't cook them'

The tone of the penultimate syllable changes from falling to level H or no tone, and the stem-initial syllable appears to resist Doubling, all under what would seem to be rather mysterious circumstances. In fact, these forms follow automatically from the analysis already specified.

Consider first the form *nikálatelééke* in (35), with a penultimate level H and no antepenultimate H. After the initial mapping rules, a H appears on the prefix *ka* (lexically), on *te* (the antepenult) and on *lee* (Default Docking). Doubling then applies to the stem initial syllable (Doubling in this dialect is not subject to the constraint that the following syllable must be toneless), but the rule does not apply to the penultimate syllable, since the syllable receiving the H tone must itself be toneless. Then Meeussen's Rule applies to the second stem syllable from the left, deleting the H of *te*. Since Meeussen's Rule iterates from left to right, the rule bleeds itself, preventing the penultimate syllable from undergoing the rule at the hands of the antepenultimate H.

- (35) H H H
 | | |
nika la te lee ke **output of mapping rules**
- H H H
 ^ | |
nika la te lee ke **Doubling**
- H H
 ^ |
nika la te lee ke **Meeussen's Rule**
- H H
 ^ ^
nika la te le e ke **Leftward Spread**

The form *nikáúkííle* involves assigning H tones to each of the syllables *ka*, *u*, and *kii*—the mapping rules give us intermediate *nikáúkííle*. Doubling cannot apply, and Meeussen's Rule deletes the middle H tone in the sequence, giving *nikáúkííle*. Leftward Spread applies to the penultimate syllable, giving the surface level H. Finally, in the form *nikáliile*, there is no stem antepenultimate syllable, so the antepenultimate H cannot dock and is simply lost (by Stray Erasure). The penult receives its H by Default Docking, giving *nikáliile*, but that H is deleted by Meeussen's Rule, since the preceding syllable is H toned.

2.4. Other stem tone patterns. In the preceding section, it was noted that the infinitive is a context where Rightward Spreading applies (except if an object prefix is present). We have thus given an account of why there is a H tone sequence in the stem, but we still need to have an account of how the first H tone gets to the stem. We assume that the infinitive prefix itself has the H tone, and that a rule shifts that H to the stem in the right circumstance. Relevant examples are given below.

- | | |
|-------------------------------|---------------------|
| (36) <i>kúu</i> [<i>lya</i> | 'to eat' |
| <i>kú</i> [<i>chii + lya</i> | 'to eat it' |
| <i>ku</i> [<i>líima</i> | 'to cultivate' |
| <i>ku</i> [<i>lá + líima</i> | 'to cultivate them' |

The contrast to note in particular is between *kú* [*chii + lya* with an object prefix and *kulíima* with no object prefix.⁴ The pattern of shifting to stem is simply that H shifts off of the prefix to any toneless syllable, and it also shifts to a H toned root syllable, but not to a H toned object prefix syllable. Perhaps this tone shifting is to be accounted for by a separate rule. However, one might also impose the appropriate morphological and tonal constraints on the Shift to Stem rule (22). There is no evidence available which tells us whether there should be a single, more complex shifting rule, or two shifting rules.

There is a periphrastic tense meaning "X has not yet V'd", which is based on the unanalyzeable stem *-nambi* followed by what seems to be a variant of the infinitive. The infinitive form of the verb always requires the prefix *-ku-*, yet this prefix is not allowed in this tense, except in one form.

- | | |
|-------------------------------|------------------------------------|
| (37) <i>nikánambi téléeka</i> | 'I haven't yet cooked' |
| <i>vakánambi úuka</i> | 'they haven't yet left' |
| <i>vakánambi pányána</i> | 'they haven't yet beat each other' |

⁴The form *kúulya* poses no problem—the final syllable is extraprosodic, so there is nowhere for the prefixal H to shift to.

<i>akánambi ngútelekeéla</i>	‘he hasn't yet cooked for me’
<i>nikánambi váoona</i>	‘I haven't yet seen them’
* <i>nikánambi kuváoona</i>	
<i>nikánambi kúulya</i>	‘I haven't yet eaten’
* <i>nikánambi Iya</i>	
<i>nikánambi chiilya</i>	‘I haven't yet eaten it’

The tone pattern of the stem is basically that of the infinitive: H is assigned to the penult by Default Docking, and a second H appears at the beginning of the stem, which spreads rightward by Rightward Spreading, causing deletion of the penultimate H by Meeussen's Rule. The monosyllabic root *Iya* constitutes a particularly interesting case. When the monosyllabic root is not preceded by an object prefix, i.e. when the super-stem is monosyllabic, then the infinitive prefix must be retained. Secondly, and here the parallelism with the infinitive is particularly strong, when the stem is composed of an object prefix plus a monosyllabic verb (*nikánambi chiilya*), we find no H tone on the object prefix. This is to be compared with the infinitive *kúchiilya* ‘to eat it’, where, too, no H appears in the stem. The explanation given for this form in the infinitive is that the infinitive prefix has a H tone, which would usually shift to the stem initial syllable, but here shift is blocked by the underlying H tone on the object prefix syllable. Meeussen's Rule later deletes the stem H. The same explanation holds for this periphrastic tense, except that the infinitive prefix, along with the H tone which sets off Meeussen's Rule, is later deleted.

The sentence-level tone sandhi behavior of this verb form is also parallel to that of the infinitive. Utterance-medially, the stem retains its H tone only if there is no object prefix (this loss of H is peculiar to the infinitive); the object takes an initial H tone.

(38) <i>kutélékéláná máloombe</i>	‘to cook maize for each other’
<i>kuvátelekela máloombe</i>	‘to cook maize for them’
<i>nikánambi vásumisa límbeende</i>	‘I haven't yet sold him the skin’
<i>vakánambi télékéláná máloombe</i>	‘they haven't yet sold each other the maize’
<i>nikánambi váteleke ntandaasa</i>	‘I haven't yet cooked them the stiff cassava porridge’

This “not-yet” tense is not the only example of a periphrastic tense constructed from an auxiliary verb plus prefixless infinitive. The future relative tense is formed from the auxiliary verb *lembela*.⁵

- (39) *inyáma ingúlembe kúulya* ‘the meat which I will eat’
midi ingúlembe súuma ‘the ropes which I will buy’
malómbe langúlembe téléeka ‘the maize which I will cook’
malómbe langúlembe vátelekeéla ‘the maize which I will cook for them’

The tone pattern selected by subjunctive verbs is controlled by whether an object prefix or negative prefix is selected. If the subjunctive has no object or negative prefix, as in (40a), the penultimate has a level H (and, as in Chimaraba, if the stem is monosyllabic, the H is assigned to the word-final syllable). If there is an object prefix (40b) or a negative prefix (40c), an extra H is mapped to the root initial syllable. Rightward Spreading applies, giving a sequence of H's stretching from the stem-initial to antepenultimate syllables. Finally Meeussen's Rule deletes the stem H from the penultimate syllable, providing that the prefix H is docked to some vowel, rather than being deleted (as it is in *uníing'e*).

- (40) a. *uu* [*lyé* ‘you should eat’
u [*líime* ‘you should cultivate’
u [*telééke* ‘you should cook’
u [*pindikúúle* ‘you should change’
- b. *u* [*níi + ng'e* ‘you should give me’
u [*chi + súume* ‘you should buy it’
u [*chi + téleeke* ‘you should cook it’
u [*ngu + píndíkúliile* ‘you should change for me’
- c. *unáa* [*lye* ‘don't eat’
una [*liime* ‘don't cultivate’
una [*téleeke* ‘don't cook’
nna [*télékélaane* ‘don't cook for each other’

Hence, *uchitéleeke* derives via Meeussen's Rule from *uchitéléeeke*, the first H being the floating prefix H of the “complex subjunctive” and the second being the stem H, docked by Stem Docking.

⁵In utterance-medial position, the word-final syllable *la* usually deletes.

The tone of the present negative also depends on the presence or absence of an object prefix. Being a noun-focal tense, there is also no pre-pausal form of the verb. When there is no object prefix, there is a single H on the negative prefix *ka-* and no stem H. When there is an object prefix, there is a string of H's from the negative prefix up to the antepenultimate syllable.

- (41) *niká* [*lya malóombe* 'I don't eat maize'
tuká [*sumisa dinúútu* 'we don't sell fried maize'
vaká [*kalangilana dinúútu* 'they don't fry maize for each other'

tuká [*vá + ona vasúnguula* 'we don't see rabbits'
tuká [*n + yáníkila dihóomba* 'we don't dry fish for him'
vaká [*tú + télékela ntandaasa* 'they don't cook stiff cassava porridge for us'

The variant with an object prefix involves assigning the stem H tone to the penult by Stem Mapping; Rightward Spreading spreads the prefix H up to the antepenultimate syllable, and Meeussen's Rule deletes the penultimate H. Explaining the variant without an object prefix is more difficult: we have to explain both why there is no stem H and why Rightward Spreading fails to apply. Since Rightward Spreading requires a following H tone as part of its conditioning environment, we will simply assume that the stem H tone is deleted by a morphologically conditioned rule.

$$(42) \quad H \rightarrow \emptyset / \left[\begin{array}{c} \text{+present neg} \\ \text{-OP} \end{array} \right]$$

Deletion of the stem H is sufficient to block Rightward Spreading.

A difference in tonal behavior between verbs having 3 person (singular or plural) versus 1 or 2 person subjects is fairly common in Bantu languages and has been found in a number of tenses in Makonde. Chimahuta also makes a more surprising distinction: the form of the perfective used with [+WH] subjects varies according to the plurality of the subject.

- (43) *nnáni á* [*liile* 'who (sg.) ate?'
nnáni a [*límiile* 'who (sg.) cultivated?'
nnáni a [*téleeke* 'who (sg.) cooked?'
nnáni a [*pílíkeene* 'who (sg.) listened?'

<i>vanáni</i> va [<i>líile</i>	‘who (pl.) ate?’
<i>vanáni</i> va [<i>limíile</i>	‘who (pl.) cultivated?’
<i>vanáni</i> va [<i>telééke</i>	‘who (pl.) cooked?’
<i>vanáni</i> va [<i>pilikéene</i>	‘who (pl.) listened?’

Despite the otherwise peculiar conditioning factor, the tone patterns themselves are clear. The simplest pattern is that selected by plural subjects: the stem H is mapped to the penultimate syllable as a falling tone by Stem Mapping. With a singular subject, we find that the stem-initial syllable has H tone, or, if that syllable already has the stem H tone (*áliile*), then the subject prefix must bear the extra H. In fact, no extra mapping rules are required for this form. We merely must assign a H tone the 3 singular subject prefix *a-* in this context, and the rule Shift to Stem will assign it to the stem-initial syllable, providing that syllable is toneless.

- (44) a. $\begin{array}{c} H H \\ | | \\ a \text{ } l i i \text{ } l e \end{array}$ **output of mapping rules**
- $\begin{array}{c} N A \\ \text{Shift to Stem} \end{array}$
- $\begin{array}{c} H \\ | \\ a \text{ } l i i \text{ } l e \end{array}$ **Meeussen's Rule**
- b. $\begin{array}{c} H \quad H \\ | \quad | \\ a \text{ } p i \text{ } l i \text{ } k e e \text{ } n e \end{array}$ **output of mapping rules**
- $\begin{array}{c} H \quad H \\ | \quad | \\ a \text{ } p i \text{ } l i \text{ } k e e \text{ } n e \end{array}$ **Shift to Stem**
- $\begin{array}{c} H \quad H \\ \wedge \quad | \\ a \text{ } p i \text{ } l i \text{ } k e e \text{ } n e \end{array}$ **Doubling**
- $\begin{array}{c} H \\ \wedge \\ a \text{ } p i \text{ } l i \text{ } k e e \text{ } n e \end{array}$ **Meeussen's Rule**

There seem to be no other contexts where 3 singular and 3 plural subject prefixes are distinguished tonally.

3. Object H Tone and Nominal Tonology

The first part of this section outlines the basic alternations encountered in nouns preceded by verb forms which assign a H tone to the object. The second part takes on tonal alternations triggered by various modifiers in the noun phrase, and the final part shows how assignment of H to objects may be affected by the application of the phrase-internal sandhi rules.

3.1. Meeussen's Rule at the sentence level. As was the case in Chimaraba, verbs in certain tenses assign a H tone to the first syllable of the following noun, and that H then spreads up to the first H in the noun by Rightward Spreading.⁶ This situation holds for Chimahuta as well. However, rather than merely assigning and spreading the H, we also find a categorial change in the surface tone of the penultimate syllable, whereby a level H toned syllable changes to falling tone, and a falling toned syllable loses its H altogether. The following examples illustrate the tone changes in nouns preceded by present tense verbs with 3 person subjects, which contrast with the isolation form and the form after a 1 person subject, which contributes no H to the noun.

(45) <i>mitéégo</i>	'traps'
<i>nguteya mitéégo</i>	'I'm setting traps'
<i>ateya mítéego</i>	'he's setting traps'
<i>chibáánda</i>	'hut'
<i>ngupyayi chibáánda</i>	'I'm sweeping the hut'
<i>apyayi chíbáanda</i>	'he is sweeping the hut'
<i>ungondóólo</i>	'kondoo'
<i>ning'aka ungondóólo</i>	'I'm hunting kondoo'
<i>ang'aka úngóndóolo</i>	'he's hunting kondoo'
<i>litíli</i>	'fruit (sp)'
<i>ngulya litíli</i>	'I'm eating litili'
<i>alya lítíli</i>	'he is eating litili'
<i>unéembo</i>	'elephant'
<i>ning'aka unéembo</i>	'I'm hunting an elephant'
<i>ang'aka úneembo</i>	'he's hunting an elephant'

⁶The conditions, phonological and morphological, on the rule assigning that H, Floating H Docking, are considered in §3.3.

<i>lijamáanda</i>	‘box’
<i>ngusumisa lijamáanda</i>	‘I’m selling a box’
<i>asumisa Ijámaanda</i>	‘he’s selling a box’

We know from the preceding section that Meeussen’s Rule applies to the output of Rightward Spreading, so the tonal change observed on the penult is as expected. The derivations in (46) show how representative surface forms are generated.

- (46) a. H H
 | |
alya li tii li **output of Floating H Docking**
- NA **Rightward Spreading**
- H
 |
alya li tii li **Meeussen’s Rule**
- b. H H
 | |
ateya mi tee go **output of Floating H Docking**
- H H
 ^ |
ateya mi tee go **Rightward Spreading**
- H
 ^
ateya mi tee go **Meeussen’s Rule**

The examples in (45) show what happens to nouns which have at least one toneless syllable at the beginning of the word. In these nouns, penultimate level H changes to falling tone, and falling tone deletes entirely. When the noun is disyllabic and therefore has no syllable preceding the penult, we find a divergence in behavior between level H and fall: H changes to fall as above, but fall does not change.

- (47) a. *mááka* ‘cat’
ninumisa mááka ‘I’m selling a cat’
anumisa máaka ‘he’s selling a cat’

<i>nyááma</i>	‘meat’
<i>ngusuma nyááma</i>	‘I’m buying meat’
<i>asuma nyááma</i>	‘he’s buying meat’
b. <i>séela</i>	
<i>ngusuma séela</i>	‘I’m buying wax’
<i>asuma séela</i>	‘he’s buying wax’
<i>ng’úuku</i>	‘chicken’
<i>ninsumisa ng’úuku</i>	‘I’m selling a chicken’
<i>ansumisa ng’úuku</i>	‘he’s selling a chicken’

As we can see from the further alternation *nivasumisa vang’úuku* ‘I’m selling chickens’ ~ *avasumisa vǎng’uuku* ‘he’s selling chickens’, the behavior of falling toned nouns is not a lexical irregularity of the stem, since when some syllable precedes the penult, their behavior is precisely as predicted, the fall being deleted.

The data in (47) can be handled with no further extensions of the analysis. In the case of level H nouns (48a), which have a rising tone at a more abstract level, the floating H contributed by the verb is assigned to the first mora of the noun’s penultimate syllable. The H of the second mora then deletes by Meeussen’s Rule. In the case of falling toned nouns (48b), the floating H docks with the first mora of the penult, but that mora already has a H tone. Therefore, the Twin Sister Convention deletes one of the two adjacent identical tones, effectively yielding no change.

(48) a.	H H	
	<i>asuma nyaa ma</i>	underlying
	HH	
	<i>asuma nyaa ma</i>	Floating H Docking
	H	
	<i>asuma nyaa ma</i>	Meeussen's Rule
b.	H H	
	<i>asuma see la</i>	underlying
	H H	
	∨	
	<i>asuma see la</i>	Floating H Docking

H
|
asuma see la **Twin Sister Convention**

There are two important constraints to be imposed on the sentence level application of Meeussen's Rule. The first is that the rule will not apply to a stem H tone which is not exclusively linked to the penultimate syllable. Consider the following alternations.

- | | |
|---------------------------|--------------------------|
| (49) <i>dimálápéende</i> | 'cockroaches' |
| <i>aona dímalápéende</i> | 'he sees cockroaches' |
| <i>ding'ávaanga</i> | 'dogs' |
| <i>asuma díng'ávaanga</i> | 'he's buying dogs' |
| <i>disúnguula</i> | 'rabbits' |
| <i>asuma dísunguula</i> | 'he's buying rabbits' |
| <i>litíkiiti</i> | 'watermelon' |
| <i>alya lítikiiti</i> | 'he's eating watermelon' |

As we saw in §2.3, the negative perfective assigns a H tone to the antepenultimate syllable, and that H may be deleted by Meeussen's Rule. It is therefore impossible to constrain Meeussen's Rule across the board to the penultimate syllable. Such a constraint must be imposed on the sentence level application of the rule.

The second constraint is that Meeussen's Rule does not apply to disyllabic verb infinitive stems.

- | | |
|------------------------|-------------------------------|
| (50) <i>kushóna</i> | 'to sew' |
| <i>alinga kúshóna</i> | 'he's trying to sew' |
| <i>kulíima</i> | 'to cultivate' |
| <i>valinga kúlíima</i> | 'they're trying to cultivate' |

We would expect, based on the behavior of other nouns with a penultimate fall, to find **alinga kúshoona* (cf. *alinga lítíili* 'he likes litili' from *alinga lítíili*). Although we have no explanation for the problem at the present, there is a significant difference between the infinitive and nouns like *unéembo* where Meeussen's Rule does apply. The infinitive underlyingly has two H tones, a stem-initial H and the H assigned to the penult by Default docking, hence *kushóna* derives from *kushóna*—cf. *kutélékéela* 'to cook for'.

Finally, there are a number of nouns with penultimate falling tone which simply are exceptions to Meeussen's Rule.

(51) <i>lulíimi</i>	‘tongue’
<i>aona lúlíimi</i>	‘he sees the tongue’
<i>dinóondwa</i>	‘stars’
<i>alo dínóondwa</i>	‘he’s looking at the stars’
<i>dimbóoko</i>	‘lice’
<i>awala dímbóoko</i>	‘he’s killing lice’
<i>liléende</i>	‘greens’
<i>alya líléende</i>	‘he’s eating greens’
<i>lukúuni</i>	‘firewood’
<i>asumisa lúkúuni</i>	‘he’s buying firewood’
<i>mawáangwa</i>	‘bones’
<i>apasu máwáangwa</i>	‘he’s breaking bones’
<i>midíidi</i>	‘ropes’
<i>asuma mídíidi</i>	‘he’s buying ropes’

For almost all the irregular nouns with known cognates in Chimaraba, the corresponding form in Chimaraba has a level H tone, which too is the tone pattern of the infinitive in that dialect. Thus compare these forms with Chimaraba *ndíidi* ‘rope’, *liwáángwa* ‘stone’, *lukúúni* ‘firewood’, *mbóoko* ‘louse’. Of the 16 recorded irregular nouns, eight have Chimaraba cognates with level H, and only one, *liléende* ‘greens’, has a falling tone (and none has rising tone). Historically, this exceptionality probably had the same source as the blockage of Meeussen’s Rule on the infinitive. Synchronically, these words are best treated as exceptions.

3.3. NP tonology. In Chimaraba we found that there were four morpho-tonemic alternations operating at the level of the noun phrase. By one rule, a H tone spreads to the end of the noun if it is followed by a demonstrative. By a second rule, any toneless noun followed by a modifier in its phrase receives a H on the penult. A third rule deletes H tones in nouns which are followed by [+WH] modifiers, and the final rule deletes all H tones in words which precede a c-commanding possessive pronoun, i.e. one in the same phrase as the pronoun. Versions of these rules can be found in Chimahuta as well.

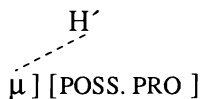
The first construction to investigate is the noun plus possessive pronoun construction. In Chimaraba, we found that all H tones of the noun were deleted in this construction, and a floating H was assigned to the final vowel of the word before the pronoun. The pattern in Chimahuta looks rather different. As the examples in (52a) show, if the noun has an underlying rising tone on the penult (surface level H), that H appears to shift to the final syllable. If the noun has no underlying tone, then one H is assigned to the final vowel. Finally, if the penult has a falling tone (52b), or if the H tone appears before the penultimate syllable (52c), then we find H tones from that point to the end of the word.

- (52) a. *lipááhu* 'lung'
lipahú lyaangu 'my lung'
chiláámbo 'world'
chilambó chaake 'his world'
chikalaángo 'frying pan'
chikalangó chaangu 'my frying pan'
- b. *ntandaasa* 'stiff cassava porridge'
ntandasá waangu 'my stiff cassava porridge'
likuungwa 'drum'
likungwá lyaake 'his drum'
nankakataambwe 'spider'
nankakatambwé waangu 'my spider'
- c. *nkwáanja* 'game'
nkwánjá weetu 'our game'
ntoliilo 'sweet potato leaves'
ntoliló waangu 'my sweet potato leaves'
língaavi 'fruit (sp.)'
lingávi lyaangu 'my fruit'
litíkiiti 'watermelon'
litíkítí lyaangu 'my watermelon'
dimálápéende 'cockroaches'
dimálápéndé jaangu 'my cockroaches'

Our account of this pattern is as follows: we will assume that the possessive pronoun comes with a floating H which docks to the final vowel of the noun preceding it.⁷

⁷In this dialect, the syntactic restrictions on placement of the possessive are more stringent than in Chimaraba. The possessive must immediately follow the head noun of the phrase, hence the possessive can never be preceded by anything but the noun. Consequently, we cannot tell how these rules would affect non-nouns.

(53) Possessive H Docking



This rule directly accounts for the form *likungwá lyaake* in (52b).

The rule Rightward Spreading handles the examples in (52c). The final vowel receives a H tone, which then triggers Rightward Spreading. Thus underlying *lingaavi lyaangu* becomes *lingaaví lyaangu* by Possessive H Docking, and that form becomes *lingááví lyaangu* by Rightward Spreading (later, phrase-medial stresses and vowel length are eliminated). The word-final H is not deleted by Meeussen's Rule, since that rule only applies to H's linked exclusively to the penult, at the sentence level.

The apparently problematic forms are those in (52a), where nouns with underlying rising tones (surface level H) seem to shift their H to the final vowel. The challenge, then, is to explain the contrast between *nkwánjá weetu* and *chilambó chaake*. The crucial difference is the distance between the word-final H tone and the H tone in the penult. In the intermediate form *nkwáanjá*, which is the output of Possessive H Docking, the first and second H's are separated by a mora, whereas in *chilaámbó*, the two H tones are on adjacent morae. Therefore, we simply require a rule deleting the first of two moraically-adjacent H's before the possessive.

(54) Possessive H Deletion

$$H \rightarrow \emptyset / \text{ _____ } H \text{ _____ }] [\text{POSS. PRO.}]$$

This rule differs (in addition to the direction and the morphological conditions) from Meeussen's Rule in requiring the involved tones to be in adjacent morae, where Meeussen's Rule merely required the tones to be on adjacent syllables.⁸

Nouns followed by demonstratives undergo tonal alternations as well. If the noun has an underlying H tone, the rightmost H spreads to the end of the word before a demonstrative. If the noun has no underlying H, a H is assigned to the penultimate syllable, and that H then spreads to the right.

⁸These alternations also give us evidence that phrase-medial words are assigned stress and vowel length at a more abstract level, even though the stress and vowel length are phonetically realized only in utterance-final position, since the only way to sustain the crucial rise versus fall contrast in the possessive construction is for there to be vowel length on the penult.

(55) <i>ng'áambe</i>	'tortoise'
<i>ng'ámbé yuula</i>	'that tortoise'
<i>ng'ámbé yúuno</i>	'this tortoise'
<i>chikáápu</i>	'basket'
<i>chikápú chíino</i>	'this basket'
<i>chikápú chiila</i>	'that basket'
<i>chikápú cháneecho</i>	'that basket'
<i>chínduuli</i>	'cassava'
<i>chíndúlí chíino</i>	'this cassava'
<i>nankakataambwe</i>	'spider'
<i>nankakatámbwé yuula</i>	'that spider'
<i>likuungwa</i>	'drum'
<i>likúngwá líino</i>	'that drum'

It was possible to account for the added H found in toneless nouns in Chimaraba by a more general rule, since a toneless noun followed by any modifier receives a H on the penult in that dialect. However, in Chimahuta, the insertion of H only applies to toneless nouns followed by a demonstrative, as the following examples show.

(56) <i>makungwa mavíili</i>	'two drums'
<i>ntandasa wákunóowa</i>	'good stiff cassava porridge'
<i>ntandasa wohewóóhe</i>	'all the stiff cassava porridge'

We therefore require the following rules, the first rule to assign a H to the penult of toneless nouns, and the second rule to spread the last H of all nouns rightward.

(57) **Demonstrative H Insertion**

[_ω ∅ → H]	[+DEMONST.]
... μ μ]	

Demonstrative Spreading

H
|
|
μ ... ω] [+DEMONST.]

The final rule of NP-tonology is the equivalent of the Chimaraba rule WH-Modifier H deletion. In Chimahuta, this rule applies only before one morpheme, *ntaani*, and not before other [+WH] modifiers (as was the case in Chimaraba).

(58) <i>chikáápu</i>	‘basket’
<i>chikapu ntaani</i>	‘what type of basket?’
<i>chikápu chilíída</i>	‘which baskets?’
<i>vikápu vingáápi</i>	‘how many baskets?’
<i>umálápéende</i>	‘cockroach’
<i>umalapende ntaani</i>	‘what kind of cockroach?’
<i>lijamáanda</i>	‘box’
<i>lijamanda ntaani</i>	‘what kind of box?’

The corresponding rule is therefore governed lexically, not by a general morphological feature.

(59) WH-Deletion

[_ω ... H → ∅ ... ω] [*ntaani*]

3.4. Object H tones and NP tonology. In this section, we scrutinize the morphological and phonological conditions on Floating H Docking more closely and see how that rule interacts with the phrase-level tone rules of the previous section.

As in Chimaraba, the basic phonological condition on Floating H Docking is that the word to which the H docks must already have a H tone. If this condition is not satisfied, the floating H docks to the final vowel of the verb.

(60) <i>awené kaanya</i>	‘he saw the mouth’
<i>asumá linkungwa</i>	‘he’s buying a drum’
<i>avawalá vanankakatambwe vakúlúungwa</i>	‘he’s killing large spiders’
<i>valyá mitandaasa</i>	‘they are eating plates of stiff cassava porridge’

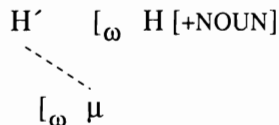
The morphological conditions on Floating H Docking in Chimahuta are similar to those found in Chimaraba. In Chimaraba, the postverbal word must be a noun. The constraints in Chimahuta correspond roughly to that constraint. We find that the floating H is not assigned to the postverbal element, but is instead assigned to the final vowel of the verb, in the following circumstances: first (61a), [+WH] words do not take the H tone, except that *cháani* ‘what’ does not cause the floating H to land on the verb; second (61b), most adverbs do not take the object H, although ‘badly’ and ‘now’, which seem to have the noun class prefix *vi*, do take the object H; third (61c), the locative morpheme *pa* takes the H tone, but the instrumental morpheme *na* does not; finally (61d), prenominal demonstratives will not take the object H tone.

- (61) a. *ateleká vingáápi* ‘how many is he cooking?’
ahená chikááni ‘when is he leaving?’
ateleké sangáápi ‘what time did he cook?’
alolá kwaachi ‘where is he looking?’
vavapanyá vanááni ‘who (pl.) are they beating?’
achekete cháani ‘what did he cut?’
(nchekete cháani ‘what did I cut?’)
- b. *aimbá saana* ‘he really sings’
aimbá chiihi ‘he's just singing’
aimbá weeka ‘he's singing alone’
aimbá chikadíiki ‘he's singing a little’
aimba víbaaya ‘he sings badly’
ateleka víino ‘he's cooking now’
- c. *alo páweelu* ‘he's looking at the field’
acheketé na chipúula ‘he's cutting with a knife’
alenjé na vakúliima ‘he's talking with the farmers’
- d. *avasumá aváno vang’ámbe* ‘he's buying these tortoises’
avawalá avalá vanankakataambwe ‘he's killing those spiders’

We can account for the difference between the instrument and the locative by according them different morphosyntactic status. If the instrumental morpheme is a word, then it does not satisfy the minimal phonological criterion that the recipient

word must have a H tone already. On the other hand, given the exceptional status of *cháani*, and the unclear morpho-syntactic status of adverbs, lexical conditioning may be required anyway. We will assume that a simple [+NOUN] condition will suffice, pending further investigation of this problem.

(62) Floating H Tone Docking



Three constructions may affect the presence of H tones in a noun, where application of Floating H Docking is of interest. The first is the combination of noun plus a possessive pronoun, before which a H tone will be added. In Chimaraba we found that the H added to toneless nouns in that construction subsequently triggers Floating H Docking. In Chimahuta, there is free variation in these constructions: either the postverbal H docks at the left edge of the noun and spreads rightward, or the H does not dock to the noun and instead appears on the verb.

(63) *avawala vánánkákátámbwé vaangu* ‘they are killing my spiders’

avawalá vanakakatambwé vaangu ”

ateleka mítándásá yaangu ‘he is cooking my plates of stiff cassava porridge’

ateleká mitandasá yaangu ”

vavalanga díkányá jaao ‘they are counting their mouths’

vavalangá dikanyá jaao ”

Similar variation exists for toneless nouns followed by a demonstrative: the H assigned by the demonstrative may trigger Floating H Docking, or it may not.

(64) *avawala vánánkákátámbwé váano* ‘he is killing these spiders’

avawalá vanankakatambwé váano ”

asuma líkúngwá liino ‘he is buying this drum’

asumá likúngwá liino ”

Since the two different H tones appear in different positions (penultimate versus final), it is hard to imagine a strictly structural account of this variation, one not invoking rule ordering. We may account for this variation by assuming that two orderings are possible between the relevant rules: if Demonstrative Deletion or Possessive Docking applies before Floating H Docking, then the later rule becomes applicable; if Floating H Docking precedes Demonstrative Deletion or Possessive Docking, then the floating H will not dock, since the noun will not yet have been assigned a H tone.

The final rule, WH-Deletion, does not appear to allow any variation. When a noun loses its H tone by that rule, Floating H Docking cannot apply.

- (65) *asumá vikapu nítaani* ‘what kind of baskets is he buying?’
 amwené ung’avanga nítwaaani ‘what kind of dog did he see?’
 asumisá lijamanda nítaani ‘what kind of box is he selling?’

This requires that a single order be imposed on Floating H Docking and WH-Deletion: WH-Deletion precedes Floating H Docking.

4. Conclusion

This completes our survey of tonal principles in two dialects of Makonde. Given the similarities and differences between these two dialects, we are encouraged to undertake more extensive comparison and reconstruction of the earlier tonal grammar of Makonde. Such a reconstruction would be of considerable value in unraveling the complex relations between the various P-zone Bantu languages. But a prerequisite to systematic comparative work on Makonde tone is the existence of descriptions of the relevant dialects, and three more dialects of Makonde remain undescribed. Such a comparison must therefore wait for another day.

APPENDIX 1

Paradigm-style examples of the verb tense are given here, including appropriate stem-length, subject prefix, and object prefix contrasts.

FUTURE POSITIVE

1 subject	3 subject	Gloss	OP
<i>naalya</i>	<i>anáalya</i>	'eat'	--
<i>nnachiilya</i>	<i>anáchiilya</i>	'eat'	it
<i>nnalíima</i>	<i>ánáliima</i>	'cultivate'	--
<i>nnachisúúma</i>	<i>anachísuuma</i>	'buy'	it
<i>nnatelééka</i>	<i>anatéleeka</i>	'cook'	--
<i>nnachitelééka</i>	<i>anachítelééka</i>	'cook'	it
<i>nnapilikáána</i>	<i>anapílikaana</i>	'hear'	--
<i>nnavavalangúíla</i>	<i>anavávalangúíla</i>	'count for'	them

FAR PAST

1 subject	3 subject	Gloss	OP
<i>nníilya</i>	<i>aníilya</i>	'eat'	--
<i>nníviilya</i>	<i>áníviilya</i>	'eat'	them
<i>nníliima</i>	<i>áníliima</i>	'cultivate'	--
<i>nniváheeka</i>	<i>aniváheeka</i>	'laugh'	them
<i>nnitelééka</i>	<i>anitéleeka</i>	'cook'	--
<i>nnichítelééka</i>	<i>anichítelééka</i>	'cook'	it
<i>nnipílikaana</i>	<i>anipílikaana</i>	'hear'	--
<i>nnivápindikúúla</i>	<i>anivápindikúúla</i>	'change'	them

NEAR PAST

1 subject	3 subject	Gloss	OP
<i>ñniilya</i>	<i>ániilya</i>	'eat'	--
<i>ñníviilya</i>	<i>áníviilya</i>	'eat'	them

<i>ńńíliima</i>	<i>áníliima</i>	‘cultivate’	--
<i>ńńívahééka</i>	<i>ánívahééka</i>	‘laugh’	them
<i>ńńítelééka</i>	<i>ánítelééka</i>	‘cook’	--
<i>ńńíchitelééka</i>	<i>áníchitelééka</i>	‘cook’	it
<i>ńńípilikáána</i>	<i>ánípilikáána</i>	‘hear’	--
<i>ńńívapindikúúla</i>	<i>ánívapindikúúla</i>	‘change’	them

POSITIVE CONDITIONAL

(káma +)

1 subject	3 subject	Gloss	OP
<i>nikáalya</i>	<i>akáalya</i>	‘eat’	--
<i>nikachiilya</i>	<i>akachiilya</i>	‘eat’	it
<i>nikáliima</i>	<i>akáliima</i>	‘cultivate’	--
<i>nikavahéeka</i>	<i>akavahéeka</i>	‘laugh’	them
<i>nikateléeka</i>	<i>akateléeka</i>	‘cook’	--
<i>nikavitelekéela</i>	<i>akavitelekéela</i>	‘cook’	it

NEGATIVE CONDITIONAL

(káma +)

1 subject	3 subject	Gloss	OP
<i>nikáalya</i>	<i>akáalya</i>	‘eat’	--
<i>nikáchiilya</i>	<i>akáchiilya</i>	‘eat’	it
<i>nikáliima</i>	<i>akáliima</i>	‘cultivate’	--
<i>nikáváheeka</i>	<i>akáváheeka</i>	‘laugh’	them
<i>nikátéleeka</i>	<i>akátéleeka</i>	‘cook’	--
<i>nikávítélékeela</i>	<i>akávítélékeela</i>	‘cook’	it

SUBJUNCTIVE

2 subject	Gloss	OP
<i>uulyé</i>	'eat'	--
<i>uvíilye</i>	'eat'	them
<i>ulíime</i>	'cultivate'	--
<i>uchilíime</i>	'cultivate'	it
<i>uteléléke</i>	'cook'	--
<i>uvatélékéele</i>	'cook for'	them

INFINITIVE

	Gloss	OP
<i>kúúlya</i>	'eat'	--
<i>kúchiilya</i>	'eat'	it
<i>kulíima</i>	'cultivate'	--
<i>kuchíshoona</i>	'sew'	it
<i>kutéléeka</i>	'cook'	--
<i>kuchítéléeka</i>	'cook'	it
<i>kupíndíkúula</i>	'change'	--
<i>kuvátelekééla</i>	'cook for'	them

APPENDIX 2

The rules cited above are recapitulated here, in their order of application.

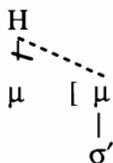
(2) Stem H Insertion

$$\emptyset \rightarrow H / [\text{STEM} ____]$$

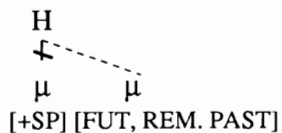
- (9) **Stem Mapping** (applies in: conditional subordinate tenses subjunctive+OP)



- (22) **Shift to Stem**

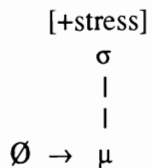


- (23) **Shift to Prefix**



- (42) $H \rightarrow \emptyset / \left[\begin{array}{c} \text{+present neg} \\ \text{-OP} \end{array} \right]$

- (1) **Stress Lengthening**



(6) **Default Docking**

$$\begin{array}{c} H' \\ | \\ | \\ \mu] \end{array}$$
(53) **Possessive H Docking**

$$\begin{array}{c} H' \\ \text{---} \\ \mu] \text{ [POSS. PRO]} \end{array}$$
(54) **Possessive H Deletion**

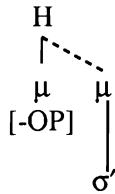
$$H \rightarrow \emptyset / \text{---} H \omega] \text{ [POSS. PRO.]}$$
(57) **Demonstrative H Insertion**

$$\begin{array}{c} [\omega \emptyset \rightarrow H \quad] \quad [+DEMONST.] \\ | \\ | \\ \mu \mu] \end{array}$$
Demonstrative Spreading

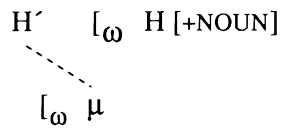
$$\begin{array}{c} H \\ | \\ | \\ \mu \dots \omega] \quad [+DEMONST.] \end{array}$$
(59) **WH-Deletion**

$$[\omega \dots H \rightarrow \emptyset \dots \omega] \text{ [ntaani]}$$

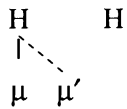
(16) Tone Doubling



(62) Floating H Tone Docking



(24) Rightward Spreading



(13) Meeussen's Rule

H → Ø / H__

REFERENCE

Odden, David. 1990. "Tone in the Makonde dialects: Chimaraba." *Studies in African Linguistics* 21:61-105.

THE ORIGINS OF THE REMOTE FUTURE FORMATIVES IN KINYARWANDA, KIRUNDI AND GIHA (J61)*

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Among the interlacustrine languages of eastern Africa Kinyarwanda, Kirundi and Giha have been classified in Bastin [1978] as dialects of the same language, identified in the zone classification system as J61. While it is certainly debatable whether or not they should be considered to constitute a single language, this classification clearly reflects the high degree of similarity and mutual intelligibility found among these three languages. Given the very close correspondences that we do find, in particular among the basic tense formatives and their meanings, it is of special interest that the remote future formatives in these languages differ as much as they do in phonological form: *-za:-* in Kinyarwanda, *zo:-* in Kirundi, and *-ro-* in Giha. Just as perplexing is the apparent *lack* in these languages of a future formative of the general form *-li-*, a form characteristic of nearly every other language in zone J. My objective in this paper is to describe and trace the probable development of these various forms of the remote future marker and, in so doing, demonstrate that they do originate in the same source as the more common form *-li-*.

0. Introduction

A long-standing, and seemingly unquestioned, belief about the remote future formative in Kinyarwanda, Kirundi and Giha (J61 in the Tervuren classification system, see maps 1 and 2), dating at least as far back as van der Burgt's [1902] sketch of Kirundi, is that the source of this formative is to be found in the auxiliary verb 'come'. It is not difficult to understand why this analysis has been

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so readily and widely accepted: the form of the remote future formative in many eastern Bantu languages resembles, to a greater or lesser extent, the form of the verb 'come'. However, we cannot assume a priori that because the two forms resemble one another that one is derived from the other, particularly when the resemblance is only partial. In the case of the languages in J61 I will argue that auxiliary 'come' is not the source of the remote future marker; rather, sound changes have occurred that have resulted in 'come' and the remote future formative having a similar form.

1. The Remote Future Formative and the COME Hypothesis

In general the three languages of J61—Kinyarwanda, Kirundi, and Giha—show very close correspondences in form and meaning in most verbal constructions. The remote future (RF) construction stands out because of the relatively wide range of variation found in the form of the tense formative, as illustrated in (1).

- (1) a. *βa-za:-tem-a* *ígiti* Kinyarwanda
 3P-RF-cut down-FV tree
 'they will cut down the tree' [FV = (stem) final vowel]
- b. *βa-zo:-tem-a* *amáshaka* Kirundi
 3P-RF-cut-FV sorghum
 'they will harvest the sorghum'
- c. *βa-ró-kor-a* Giha: Sambeek n.d.
 3P-RF-work-FV
 'they will work'

The RF formative in Kinyarwanda and Kirundi resembles the verb *ku:-za* 'to come' (root = -:z-), a fact noted very early by Hurel [1911] for Kinyarwanda and van der Burgt [1902] for Kirundi. Hurel lists two future constructions for Kinyarwanda: one (2a) a periphrastic construction involving auxiliary 'come' plus the infinitive, the other (2b) incorporating *-za(:)-* as a prefix. He considers these two occurrences of *-za(:)-* to represent one and the same auxiliary element.

- (2) a. *a-za gu-kora* 'he will work (later today)'
 b. *a-za-kora* 'he will work (after today)'
 (N.B. tone and vowel length are not marked by Hurel)

Both constructions continue to exist in modern Kinyarwanda. Van der Burgt, in a similar vein, states quite categorically with respect to Kirundi that the RF formative “est l'auxiliaire essentiel pour le temps futur et dérive indubitablement de *ku-za* = venir” [1902:43].

Analysis of the verb ‘come’ as the source of the RF formative is widespread in descriptions of other eastern Bantu languages as well. The examples in (3-7) attest to a few of the instances that can be found in the literature.

- | | | |
|--|--|------------------|
| (3) <i>ni-za-et-a</i>
1S-F-bring-FV
‘I will bring (it)’ | Pare G22

-z- ‘come’ | [Nurse 1979a] |
| (4) <i>tu-tso-γul-a</i>
1P-F-buy-FV
‘we will buy’ | Luguru G35

-t _{sa} ‘come’ (<i>t_{sa} + o > tso</i>) | [Nurse 1979b] |
| (5) <i>a-ka-ísáá-boomb-a</i>
3S-F-RF-work-FV
‘he’ll work later on’ | Chibemba M42

<i>uku-isa</i> ‘to come’ | [Givón 1969] |
| (6) <i>m-dzá-wɔn-a m ma:wá</i>
2P-RF-see-FV in morning
‘you’ll see in the morning’ | Chichewa N31

<i>ku:dza</i> ‘to come’ | [Watkins 1937] |
| (7) <i>u-do-zwim-a</i>
3S-F-hunt-FV
‘he will hunt’ | Venda S21

<i>u-da</i> ‘to come’ (<i>da + u-(inf) > do</i>) | [Zierfogel 1961] |

Given the pervasiveness of the phenomenon, analysis of Kinyarwanda *-za:-* and Kirundi *-zo:-* as originally derived from auxiliary ‘come’ seems, at first glance, both straightforward and quite appealing. Nevertheless, as seductively simple and explanatory as the ‘come’ hypothesis might appear, there are several disturbing observations that suggest problems with such an analysis. First, the verb ‘come’ in Kinyarwanda either has the vowel /i/ initially (for example, when preceded by the reflexive prefix (-*ĩ:-*)) or produces lengthening of the preceding vowel, as the examples in (8-9) attest, whereas the RF formative never appears with an initial vowel nor does it produce vowel lengthening.

- (8) *kw-î:y-iz-ir-a* 'to come oneself'
- (9) a. *ku-:z-a* 'to come'
 b. *a-ra-:z-a* 'he/she will come (later)'
 c. *βa-:z-a βuri mu:nsi* 'they come every day'

Second, *-:z-* 'come' is not followed by a long /a:/ in derived compounds as are other monosyllabic verbs such as *-tá* 'abandon, break off (habit)' (compare 10a and 11a). Nor does *-:z-* exhibit a long /a:/ when followed by another morpheme, such as the associative suffix *-an-*, whereas *-tá* does (compare (10b) and (11b)). The RF formative always exhibits long /a:/; hence, even if the source were *-:z-*, something would have to have been added to produce the observed lengthening.

- (10) a. *umu-:za-joro* 'rain that begins at night and is prolonged'
 -:z- 'come'
 ijoro 'night'
- b. *ku-:z-an-a* 'to come with; bring'
- (11) a. *ín-tá:-bê:re* 'child weaned too early'
 -tá 'abandon'
 îβê:re 'breast'
- b. *gu-tá-an-a* 'to separate oneself from, break with (something)'

Third, the verb *-:z-* is always low-toned, whereas the RF formative has an underlying high tone [Overdulse 1975, Botne 1983] which is realized on the surface only in certain constructions such as the negative.

- (12) *ejó* *nti-βá-zâ:-kor-a* *mu rúgo*
 tomorrow NEG-3P-RF-work-FV in compound
 'tomorrow they will not work in the compound'

Fourth, Kinyarwanda and Kirundi are in an area where the predominant RF formative is a reflex of *-li-*; no other languages in the area appear to have a reflex of 'come' as a future formative, though some, such as Orusyan (J36) and Lumasaba (J31), have developed a future formative from the auxiliary *-kanga/-kana* 'want, intend'.

While these observations are not in themselves sufficient reason to reject the ‘come’ hypothesis outright as the source of the remote future markers *-za:-* in Kinyarwanda or *-zo:-* in Kirundi, they do suggest that a closer examination of the phenomenon is warranted. In the following sections, then, we consider alternatives to the ‘come’ hypothesis that provide a much more satisfactory explanation of the data.

2. *-li-* as Source of the Remote Future Formative

The majority of languages in zone J express the remote future through the use of a variant form of *-li-*. The following examples illustrate the various forms that *-li-* has assumed in these languages.

- | | | | |
|------|--|----------------|--------------------------|
| (13) | <i>a-li-tu-laba</i>
3S-RF-1P-see
‘he/she will see us’ | Luganda J15 | [Ashton et al. 1954] |
| (14) | <i>a-ri-gonza</i>
3S-RF-love
‘he/she will love’ | Ruziba J22 | [Rehse 1912] |
| (15) | <i>a-rya-gura ebintu</i>
3S-RF-buy things
‘he/she will buy things’ | Runyankore J11 | [Morris and Kirwan 1972] |

Of particular relevance for the analysis of Kinyarwanda *-za:-* is the example in (15) from Runyankore, a language bordering Kinyarwanda on the north. In Runyankore we find the form *-rya-*, which can be further analyzed as *-ri + a-*. Such an analysis is confirmed by the relative and negative RF constructions in which we find only the formative *-ri-*, as in (16). (Note that the use of “(” in the examples indicates deletion of following vowel, “)” deletion of a preceding vowel.)

- | | | | |
|------|--|----------|--------------------------|
| (16) | a. <i>o-ri-gura...</i>
3Srel-RF-buy
‘he/she who will buy...’ | Relative | [Morris and Kirwan 1972] |
|------|--|----------|--------------------------|

- b. *t(i-a-rí-gura ebintu Negative*
 NEG-3S-RF-buy things
 'she will not buy things'

The relevance of the formative *-a-* for the present analysis is not to be found in its function (which is unclear), but in its areal distribution. In addition to Runyankore, we also find it in Lunyoro J11 (see Mould [1981]), Karagwe J21, and perhaps in Mashi J53 general future *-aa-* [Polak-Bynon 1975] (see map 3 in Appendix). That Kinyarwanda also incorporates this formative can be seen from a comparison of the basic tense formatives in the remote past, recent past, present/near future, and remote future [Botne 1983].

(17) Kinyarwanda tense formatives

remote past	<i>-a</i>	+	<i>(ra-)</i>
recent past	<i>-a</i>	+	<i>(a-)</i>
pres/nf	\emptyset	+	<i>ra-</i>
remote future	<i>-zV</i>	+	<i>a-</i>

We may note here a pattern of regular alternation between *-ra-* and *-a-* in this sequence of tenses, rendering the segmentation of *-za:-* into two components quite appropriate. Kimenyi [1986] scoffs at this analysis as farfetched, arguing that *-za:-* is never segmented. However, he neglects to consider that the usage of *-ra-/a-* in past constructions is determined by syntactic criteria, while in the non-past they are obligatory. So while it is true that *-za:-* always occurs as an inseparable unit, we can see from this pattern of regular and systematic alternation of forms and from the fact that neighboring languages also manifest this *-a-* formative in the same environment that *-za:-* is a bimorphemic form derived originally from two distinct elements: *-zV-* and *-a-*.

The question we must now consider is, "To what did this *-a-* become attached? Was it the auxiliary verb *-:za* 'come' as traditionally hypothesized? Or was it something else?" I suggest that it was not *-:za*, but rather *-zí-*, a form derived phonologically from *-rí-* through spirantization. What is crucial for this analysis is the original nature of the vowel, a high close */i/* or the non-close */i/*. Guthrie [1971] reconstructs **-di-* (non-close) as the RF formative in his comparative series CS2245. However, although most of the languages of zone J have shifted from a proto-Bantu seven vowel system to a five vowel system in which the */i/* and */i/* have collapsed together, Lulogooli (E41 in Bastin [1978], but considered part of the Greater Luyia group (J30) by Mould [1981]) has maintained the seven vowel system. And here we find *-ri-* rather than *-ri-* (**j > i, *i > ɪ* [Mould

1981:187]). This observation suggests that, in fact, the original form had the high, close /i/, a significant fact for phonological processes in Kinyarwanda.

In Kinyarwanda an /r/ followed by a high, close /i/ became spirantized. Consider, for example, the case of the class 5 nominal prefix which was originally *-rĩ-*. Before C-initial stems the /r/ became lost, a phenomenon also reported for northeast coast Bantu languages [Hinnebusch 1981]. Before V-initial stems the /r/ became spirantized, as the examples in (18)-(19) attest.

(18) *i+zĩ+ifo* - *á+mâ:+i)so* 'eye/s' { < *i-rĩ-(y)ico* }

(19) a. *ĩ+zi+iko* - *a+má+zĩ:ko* 'hearth/s' { < *i-rĩ-(y)iko* }

b. *ĩ+z(ĩ+uru* - *a+má+zũ:ru* 'nose/s' { < *i-rĩ-(y)ulu* }

Subsequently the /z/ became reanalyzed in some instances (as in 19) as part of the stem. Such reanalysis is not limited to Kinyarwanda, but occurs in other eastern Bantu languages as well. Hetherwick [1914], for example, records an alternation in Chinyanja (N31) plural forms of class 5 nouns in the process of being reanalyzed that mirrors that observed for Kinyarwanda.

(20) *dz(i)+ino* - *ma+no* ~ *ma+ino* ~ *ma+dzino* 'tooth/teeth' Chinyanja N31

From the example in (19b) we see that the vowel /i/ of the prefix in Kinyarwanda is lost with subsequent lengthening of the following vowel, in this instance /u/. It is this path of change, I believe, that is responsible for the present form of the RF formative in Kinyarwanda. The formative *-rĩ-* was followed by *-a-*; in this environment the /r/ became spirantized and the *-a-* lengthened in the same manner as the class 5 nominal prefix, resulting in *-za:-*.

(21) *-rĩ* + *a-* > *-zí* + *a-* > *-zâ:-*

Comparison of the RF formative with the class 5 prefix gains further support from Runyankore, the neighboring language to the north. There we find that spirantization of the class 5 prefix did not occur in vowel-initial nominals, as illustrated in (22).

(22) *erĩ-ifo* 'eye' Runyankore J11

Nor did the RF formative undergo spirantization even though the same conditions existed in Runyankore (23) as those proposed for Kinyarwanda. That is, both formatives, *-rĩ-* and *-a-*, were present.

- (23) *a-rya-gura eβintu* 'he/she will buy things' Runyankore

In sum, the evidence points to an earlier period in Kinyarwanda in which there existed a formative *-rj-* associated with remote future reference. Subsequent incorporation of *-a-* led to spirantization of the */r/* and lengthening of the vowel */a/*. This alternative hypothesis accounts for all the suspicious problems noted with the 'come' hypothesis and provides a coherent and plausible explanation commensurate with the data observed. Nevertheless, there are some indirect indications that *-rj-* may not have been an original formative in proto-Bantu as implied in Guthrie's reconstruction of **-di-*.

3. An Alternative History of *-rj-*

In two zone J languages on the eastern side of Lake Victoria, Kikwaya (J25) in Tanzania and Luyia (J32) in Kenya, we find a peculiar aberrancy in the form of first person subject prefixes. In Kikwaya there are three future formatives. Relevant to our study is the similarity in form between the near future formative *-la-* and the remote future formative *-li-*. Depending on which is present, the form of the first person singular subject prefix differs, as illustrated in (24) and (25). (Through a regular phonological process in Bantu languages *//* becomes *[d]* immediately following a nasal.)

- (24) a. *ni-la-kol-e* 'I will do' (near future) Kikwaya [Sillery 1932]
 b. *n-da-kol-e*
- (25) a. *ni-li-kol-a* 'I will do' (remote future) Kikwaya
 b. **n-di-kol-a / *ndi-li-kol-a*

In the near future construction two forms of the 1S prefix are found, *ni-* or *n-*. However, when the construction incorporates the RF formative, only the *ni-* subject prefix is acceptable. A similar phenomenon is found in Luyia, as reported by Appleby [1961]. Normally the first person singular is indicated by *en-*, with some regular phonological variations resulting in deletion of the */n/*. However, with the remote future formative the form becomes *ndi-* (26).

- (26) a. *ndi-li-khol-a* 'I will do' (remote future) Luyia
 b. **en-di-khol-a*

Why should the simple (*e*)*n*- form of the first person subject prefix be precluded in these languages in juxtaposition with the remote future formative *-li-*? A likely answer is that *-li-* is not the original canonical form of this formative. Rather, the RF must have had (at least) the form *-Vli-* at an earlier stage, and it is this form that constituted the original motivation for the non-occurrence of the (*e*)*n*- form. If the 1S subject prefix was originally of the form **ni-* or **ndi-*, as reconstructed by Guthrie [1971], then reduction to nasal alone only occurred before C-initial formatives such as *-la-*. This suggests that the remote future formative must have had an initial vowel, probably **/i/*. If, on the other hand, the 1S prefix was a nasal alone, as suggested in Meeussen [1967], reanalysis of a RF sequence *nili-* as *ni + li-* (rather than as *n + ili-*) and extension of the *ni-* form to other constructions would also account for the distribution noted. In either case the analysis of *-li-* as a reduced form of *-ili-* is significant. Is this *-ili-* a canonical, underived form, or is it derived from some auxiliary verb, for example? Consideration of morpho-syntactic phenomena in several contiguous zone J languages suggests that it is analyzable as composed of two parts.

In Botne [1989] I have argued that the RF formative in the J40 languages (Kikonzo J41 and Kinande J42) originated in the auxiliary verb *-gind-* ‘want’. More specifically, the RF formative developed out of a particular form of this verb, *-(g)ind-il-ḷ-a* [*-indiḷʷa-*]. Note the suffix */-ḷ/* here. Both Mashi (J53) and Nyanga (D43), languages located just south of Kikonzo and Kinande, incorporate a final */i/* (from **ḷ*) in some future constructions (27-28).

(27) *rhw-aa-gend-i-sunik-a* Mashi J53
1P-F-go-push

‘we are going to push’

(28) *tw-a-kinduk-i* Nyanga D43 [Mateene 1980]
1P-F-cross

‘we will cross (one day)’

As we can see in Mashi, a periphrastic construction with what seems to have been an */i/* suffix from the auxiliary has become a grammaticalized verbal form. This phenomenon resembles what we have observed in Kikonzo and Kinande. These data suggest that the final *-a-* in the Kinande/Kikonzo future has been added to the verbal expression as it was in Runyankore/ Lunyoro and Kinyarwanda, languages that are contiguous with them. Moreover, they suggest that our hypothesized form *-ilḷ-* can be analyzed as *-il + ḷ-*, that is, root plus suffix. A supporting

argument for this analysis of root plus suffix can be adduced from the RF in Giha. Unlike Kinyarwanda and Kirundi where we find *-za:-* and *-zo:-*, respectively, there appears to be no evidence of spirantization in the RF formative, which is *-ro-*. Given the closeness of these languages and the pervasiveness of spirantization in this region, how can we explain this? Since Giha underwent spirantization of the class 5 nominal prefix as noted for Kinyarwanda above, we must conclude that Giha did not make use of the *j* suffix in these constructions, employing *-a* instead. Coalescence of auxiliary final *-a* and infinitive initial *(k)u-* of a periphrastic construction resulted in *-ro-* (see next section for discussion).

Additional evidence can be adduced from Chigogo (G11). In Botne [1988] I suggest that the future formatives in Chigogo (as in 30) most plausibly derive from an earlier periphrastic construction composed of auxiliary *-hila* 'want' plus the infinitive (*-hila* from **-pila*).¹

(29) *-hila ku-root* > *-hilɔ-root* > *-ɔɔ-root* (RF); *-ɔ-root* (NF) Chigogo G11

(30) a. *n-ɔ-saga matama* 'I will grind (some) maize' (NF) Chigogo G11

b. *n-ɔɔ-panta matama* 'I will plant (some) maize' (RF)

Kinyarwanda and the other J languages have undergone weakening of **p* to [h]. Thus, it seems quite plausible that an auxiliary verb **-pil-* 'want' was the source of the remote future. From an original periphrastic construction in which the final vowel of the auxiliary was the suffix [i] (a syntactic type that no longer exists in most of the J languages) came a grammaticalized formative *-lj-* in seven-vowel systems, *-li-* in five-vowel systems.

(31) **-pil-i ku-root* > *-hil-i ku-root* > *-li-root* (5-vowel languages)
-lj-root (7-vowel languages)

In Kinyarwanda, which added the *-a-* formative, the final result is *-za:-*, rather than *-li-*. Thus, while the data directly support an earlier stage of *-lj-*, indirectly they suggest that this form may have been derived from an even earlier auxiliary

¹In not too distant Kimabiha (P25) we find the form *tu-lembe-kutenda* 'we will (to) make' (remote future) in which *lembe-* is the grammaticalized form of the infinitive *ku-lembe* 'to want'. This appears to be a derived stem, from *-li-mbe-l-a*, where the prefix *-li-* is an intransitivizer/reflexivizer. In closely related Kimakua (P31) we find what appears to be a cognate form *-li-pe-l-a* 'to expect, hope'. **mb* became [p] in Kimakua. Thus, Chigogo *-hila* 'want' would appear to be cognate with the verbs in these two languages, with /p/ ultimately becoming weakened to /h/.

verb, most plausibly a verb 'want'. Let us turn now to consideration of the form -zo:- in Kirundi and -ro- in Giha.

4. Evolution of Kirundi -zo:- and Giha -ro-

Considering the close linguistic relationship among Kinyarwanda, Kirundi and Giha, we might expect to find reflexes of the remote future in Kirundi and Giha similar to that found in Kinyarwanda. In Kirundi we do: Kirundi -zo:- differs from Kinyarwanda -za:- only in vowel quality. In Giha, however, the RF formative is -ro- .

The obvious link between the formatives in Kirundi and Giha is the vowel quality. This is not a trivial observation because there are no other languages in zone J that have verbal formatives with /o/. There are such languages in zone G and, significantly, these formatives are associated with future reference (see map 4).

- (32) a. *n-ɔ-bita* Chigogo (G11) [Cordell 1941]
 1S-F-go
 'I will go (near future)'
- b. *n-ɔɔ-bita*
 1S-RF-go
 'I will go (remote future)'
- (33) a. *n-o-ɣula tsinjowo* Luguru (G35) [Nurse 1979b]
 1S-Pr/F-buy bananas
 'I am buying/will buy bananas'
- b. *tu-tso-ɣula tsinjowo*
 1P-RF-buy bananas
 'we will buy bananas (remote)'
- (34) *n-o-gula ɲhoo* Kizalamo (G33) [Nurse 1979b]
 1S-Pr/F-buy bananas
 'I am buying/will buy bananas'

A common source of /o/ in verbal formatives in Bantu is contraction/coalescence of final -a of an auxiliary verb and initial *ku-* of the infinitive in a periphrastic construction. As mentioned in the previous section, for Chigogo, a zone G

language, my suggestion (presented in Botne [1989]) is that the remote future derives from such a process involving an auxiliary formative *-hila* 'want' (see 29). A similar process in Giha would account for the presence of the form *-ro-*. Unlike Kinyarwanda and Kirundi the RF formative in Giha did not undergo spirantization since we find /r/, rather than /z/, even though spirantization of /r/ occurred with the class 5 nominal prefix as it did in both Kinyarwanda and Kirundi. Thus, there would have been a different vowel, undoubtedly [a]. An auxiliary verb ending in *-a* would be in position to combine with *ku-* to produce /o/, a common change in eastern Bantu languages. If we assume that incorporation of prefixal *-a-* into Kirundi and Kinyarwanda preceded coalescence of *-a* and *ku-*, then we have a viable case for Kirundi as the intersection of the two processes (see map 5).

What these data suggest, then, is that the three J61 languages illustrate the intersection of three different historical developments: (1) utilization of the suffix *-j* on an auxiliary verb; (2) spirantization of /r/ to /z/ when it occurs before /j/; and (3) contraction/coalescence of auxiliary final *-a* and infinitive initial *ku-* to /o/. The relationship of these three developments in the languages under consideration is outlined in (35), at the top of the next page (note that there is no distinction between /l/ and /r/ in these languages).

This analysis of Giha *-ro-* gains support from the analysis of the Chigogo RF formative. In Botne [1988] I have argued that Chigogo and Giha are close genetic relatives and were once areal neighbors. Given that Giha and Chigogo are the only languages in east Africa manifesting the RF formative with *-ro-/lo-*, it is not surprising to find that they have undergone the same development of an auxiliary. At this point it is not clear where certain innovations arose nor why they might have spread, nor is it apparent when the loss of initial *hi-* might have occurred. What is clear from the distribution of these different developments is that they intersect in J61, apparently resulting in different forms of the remote future formatives that otherwise would be expected to be more similar.

(35)	Kinyarwanda	Kirundi	Giha	
	---	---	<i>-hil-a ku-</i>	<i>-a</i> final aux
	<i>-hil-j ku-</i>	<i>-hil-j ku-</i>	---	<i>-j</i> final aux
	<i>-hiz-a:-ku-</i>	<i>-hiz-a:-ku-</i>	---	incorporation of <i>-a-</i> ; spirantization
	---	<i>-hiz-o:-</i>	<i>-hil-o-</i>	contraction/coalescence
	<i>-hiz-a:-</i>	---	---	loss of <i>ku-</i>
	<i>-za:-</i>	<i>-zo:-</i>	<i>-lo-</i>	(phonological loss of <i>-hi-</i>)

5. Summary and Conclusion

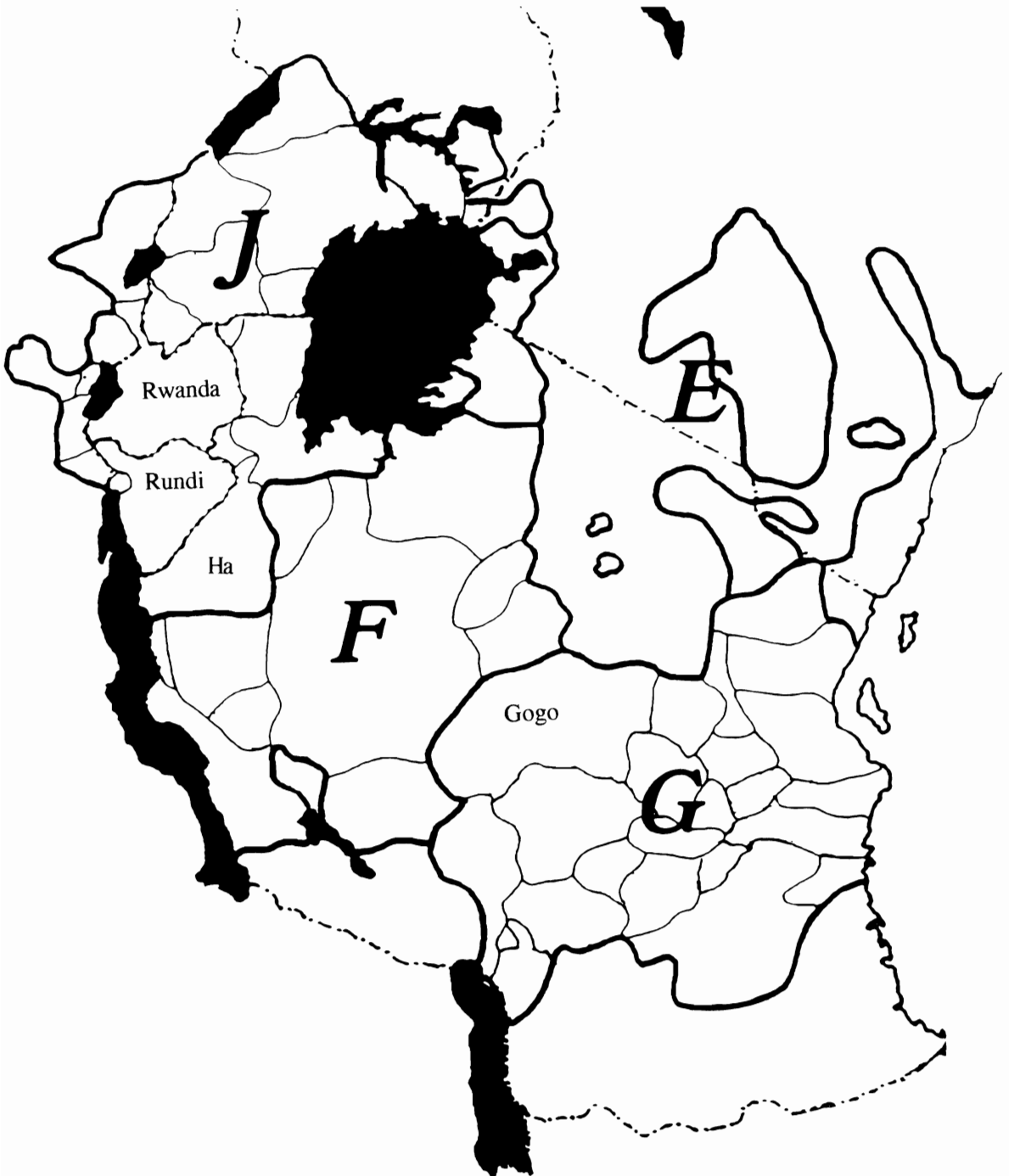
Traditionally, the source of the remote future formative in J61 has been considered to be the verb *ku:-za* ‘to come’, an analysis which presented several problems. Evidence from different zone J languages supports the hypothesis that the remote future formative in various languages of zone J, including J61, is a reflex of *-lj-*, which itself may be derived from an auxiliary verb **-pila* ‘want’. Exceptions to this are the languages of J40 and J50 and Orusyan (J36) in which the RF formative has developed from different auxiliaries.

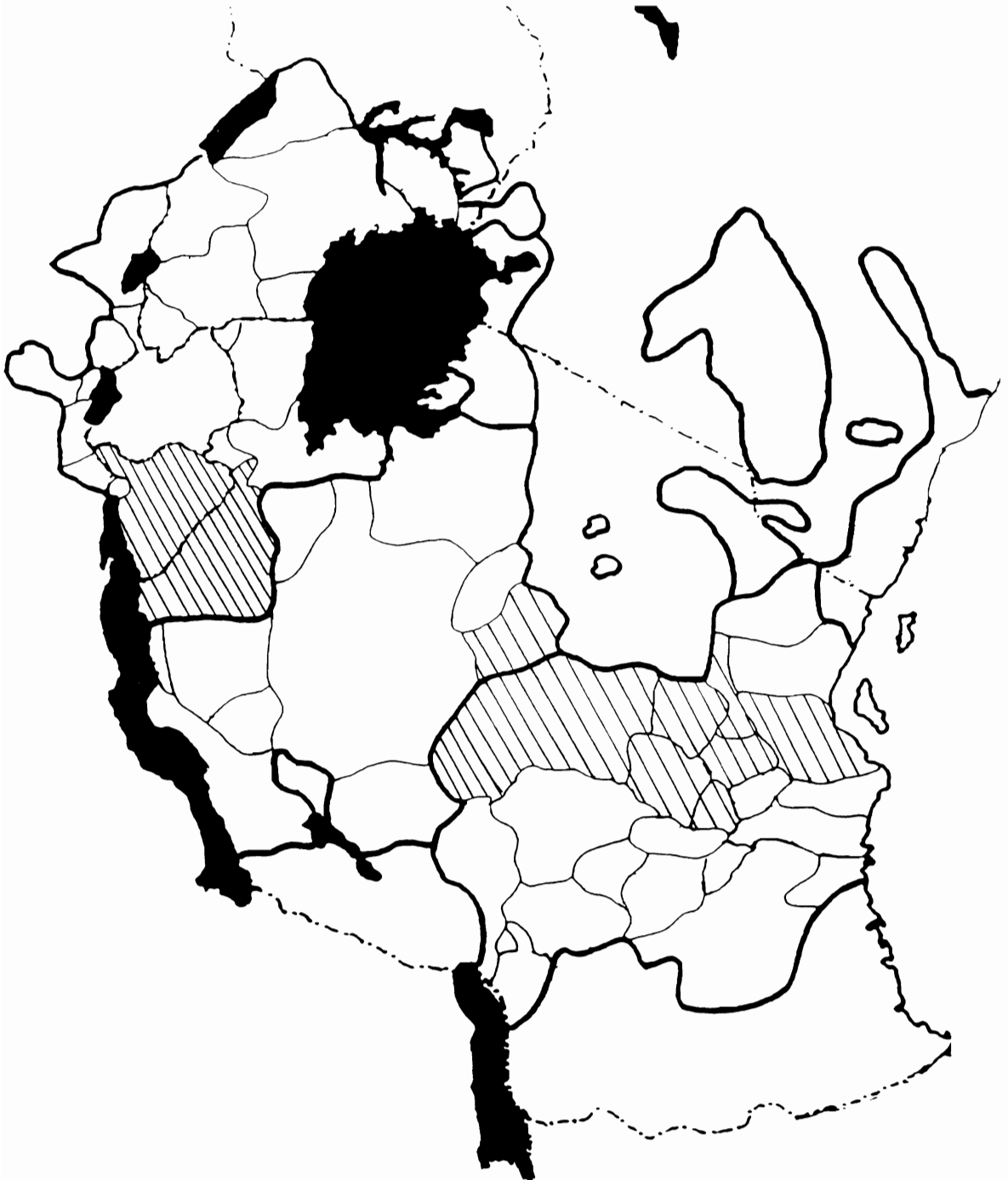
An alternative hypothesis put forward here—that *-lj-* evolved from an auxiliary verb **-pila* ‘want’—is based on indirect and circumstantial evidence, there being no instance of this auxiliary plus infinitive in any of the languages in question. Thus, while we can confidently conclude that the remote future formative in J61 had an earlier form *-lj-*, we need to gather further evidence supporting (or refuting) the auxiliary ‘want’ hypothesis. Nevertheless, the hypothesis is warranted on the strength of the answers it provides to a number of problems in variation and distribution of forms found in the J61 area, presenting a coherent picture of the interaction of several linguistic processes observed there.

If we are to make accurate comparative studies, reasonable reconstructions of verbal formatives and satisfactory classifications of languages and their movements, then we need to question some of the assumptions about morphological development that have been around for generations. While ‘come’ as an auxiliary verb may, indeed, be the source of future tense formatives in some Bantu languages, we cannot, automatically and without detailed analysis, assume that because the form (usually only the consonant) of the RF formative resembles that of the verb ‘come’ that the one is necessarily derived from the

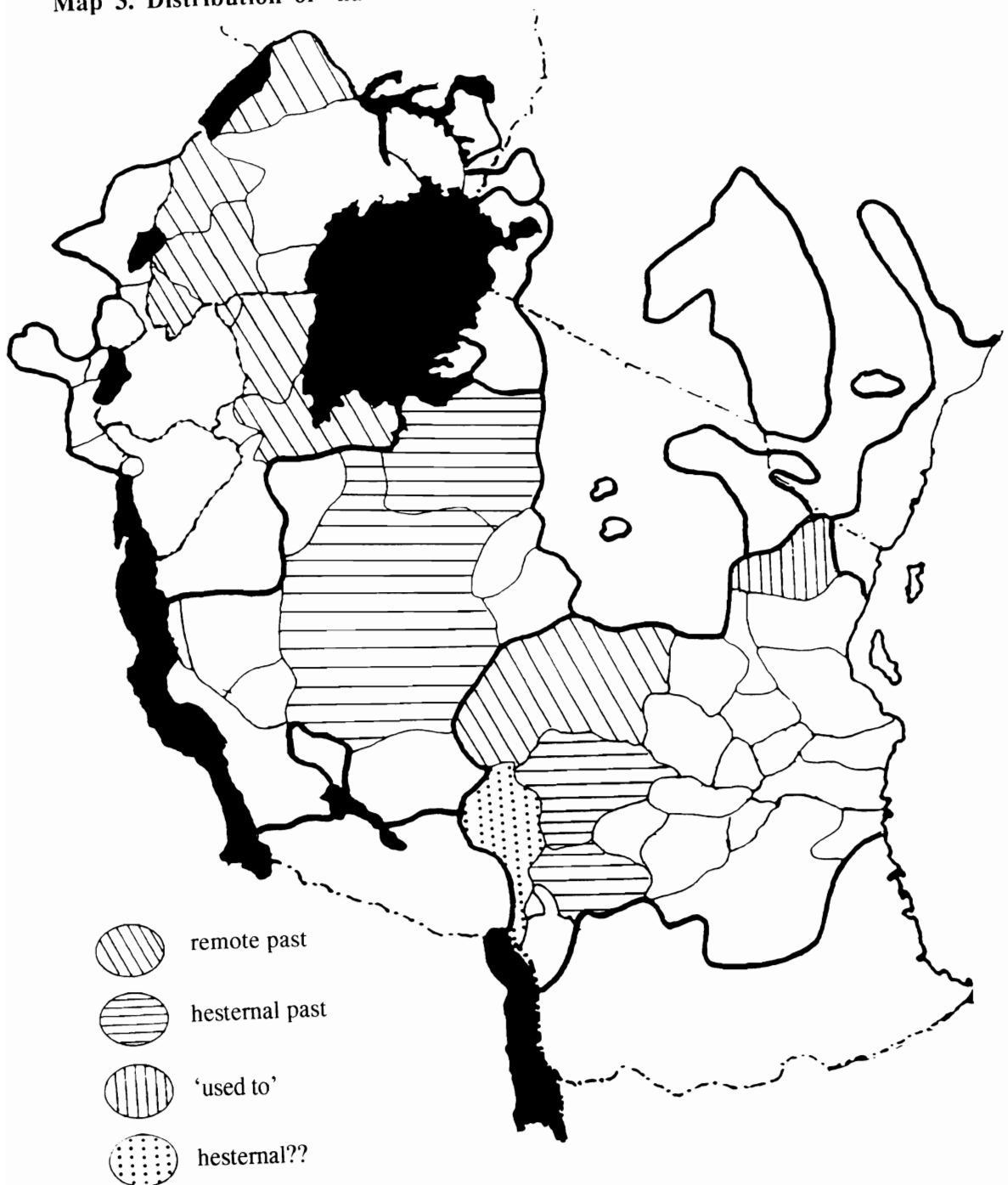
other. In many instances we simply have a case of convergent phonological evolution. We need to go back and look again at languages like Luguru, for example, and provide evidence for an analysis one way or another.

Map 1. Eastern Bantu Zones

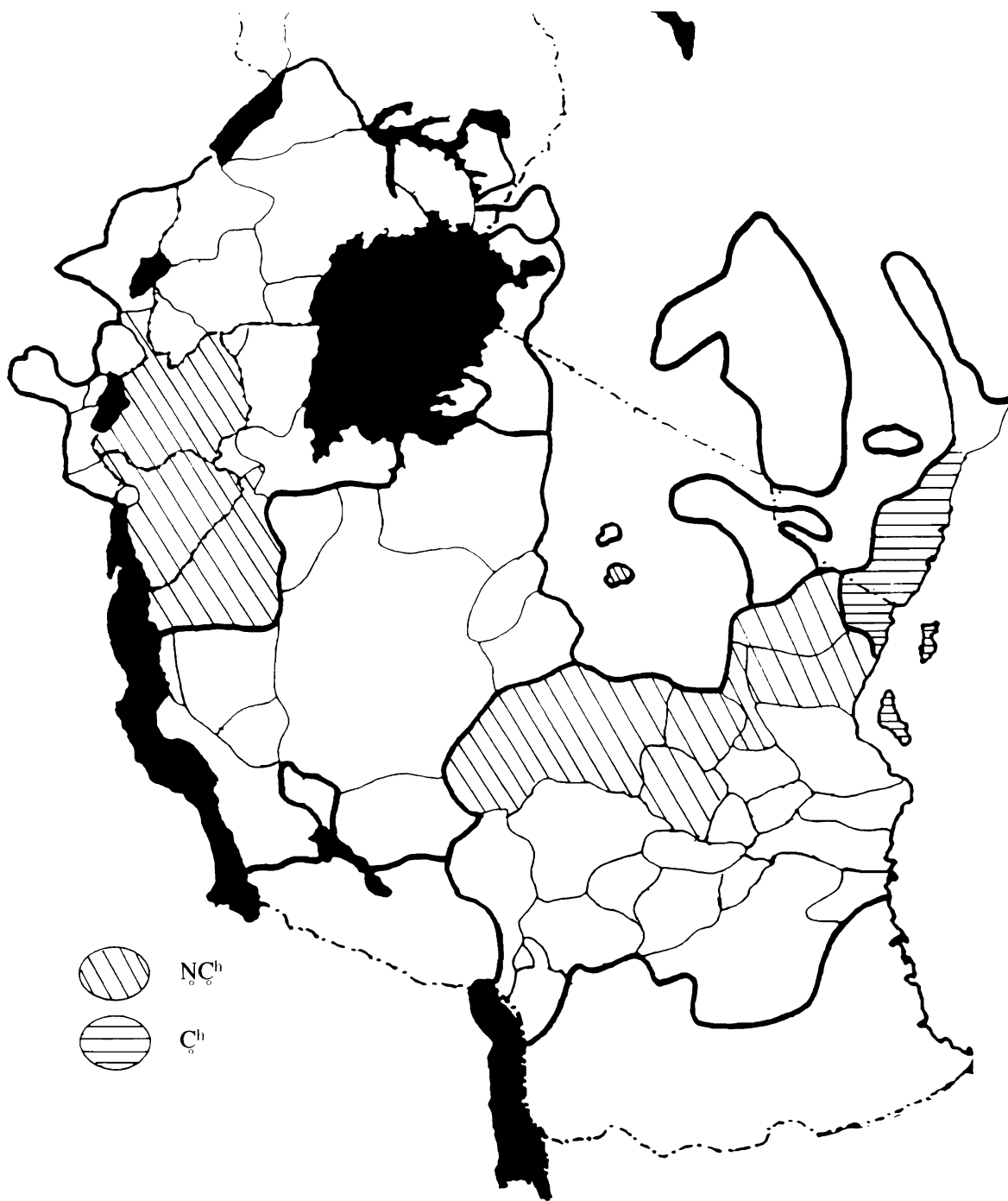


Map 2. Distribution of RF /o/ formatives

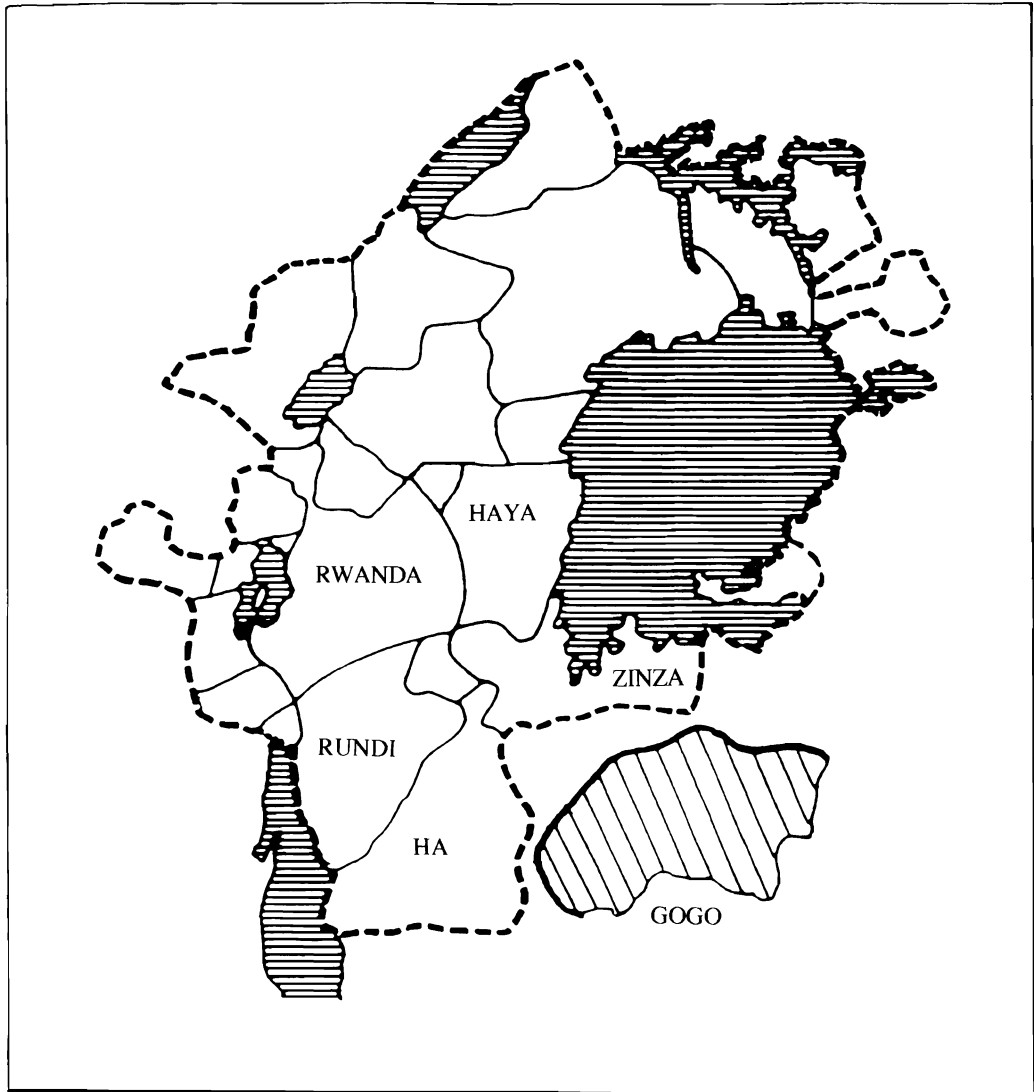
Map 3. Distribution of -ka- formative (past)



Map 4. Distribution of nasal clusters with weakening of N
(based on data from Nurse 1979b)



Map 5. Suggested historical relationship of Cigogo to Giha & Ruzinza



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RESUMPTIVE PRONOUNS IN TUKI*

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This paper argues that in Tuki, gaps construed with WH- or topicalized phrases are null resumptive pronouns rather than WH-traces. Gaps alternate with overt resumptive pronouns. Structures with a gap parallel analogous structures with overt resumptive pronouns with regard to subadjacency violations and violations of the Condition on Extraction Domains of Huang [1982], coordination tests, and weak crossover phenomena: gaps and overt pronominals fail to produce weak crossover violations, unlike structures with quantified NP's. Moreover, both the gaps and the overt resumptive pronouns license parasitic gaps, further strengthening the analogy.

1. Introduction

This paper reveals that gaps in Tuki WH-constructions should be analyzed as null resumptive pronouns which do not involve movement rather than variables left

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f1 = future tense one marker
Neg = negation marker
OM = object marker
p1 = past tense one marker
p2 = past tense two marker
SM = subject marker

by “Move Alpha”. In Tuki, a Bantu language of Central Cameroon (West Africa), the head of the WH-phrase can be associated with a gap or a resumptive pronoun. Generative Grammar analyzes the gapped examples as instances of “Move Alpha”, a general rule that prohibits movement from island environments. The fact that the resumptive pronoun strategy in Tuki violates Bounding Theory is expected under current assumptions in the field whereas such a violation is unexpected under a movement analysis of the gapped constructions. However, Tuki consistently appears to violate island conditions such as the Complex Noun Phrase Constraint, the WH-island, the Constraint on Extraction Domain, and the Sentential Subject Constraint. Moreover, coordination of a clause containing an overt resumptive pronoun and a clause containing a gap is possible. Furthermore, while resumptive pronouns fail to exhibit weak crossover effects, gapped sentences also fail to exhibit weak crossover effects, suggesting once again that these gaps are pronominals and not WH-traces.

In the next section, we introduce the reader to Tuki and claim that Tuki is a pro-drop language. In §3, we establish the parallelism between gaps and resumptive pronouns in Tuki WH-constructions. In §4, we provide evidence that the behavior of the gapped sentences is similar to the behavior of the sentences containing resumptive pronouns with respect to island constraints. §5 shows that overt resumptive pronouns as well as gaps do not exhibit weak crossover effects (at S-structure). The analysis of anaphoric binding in §6 strengthens the idea that resumptive pronouns are syntactically bound. §7 examines two cases of coordination, one of which appears to violate the Coordinate Structure Constraint (CSC) but in fact does not. In §8 we show that Tuki exhibits weak crossover effects at LF, providing thereby further support that gaps in Tuki WH-constructions are non-overt resumptive pronouns, which explains the non-existence of weak crossover effects at S-structure.

2. Tuki as a Pro-drop Language

Tuki is a language of the Niger Kordofan (Niger-Congo) linguistic family; subfamily: Benue Congo; branch: Bantoid; division: Bantu; group: Sanaga A60. It is spoken by 26,000 speakers who live in Central Cameroon (West Africa). Tuki is verb initial in VP; basic word order is SVO:

- (1) a. *Mbara a nobam vadzu* ‘Mbara beats children’
 Mbara SM beats children
- b. *vadzu va nobam Mbara* ‘children beat Mbara’
 children SM beat Mbara

Tuki is also a null subject language since it allows the subject position of finite clauses to be empty [Chomsky 1981, 1982; Jaeggli 1982; Rizzi 1982]. Like many

Bantu languages, Tuki is a noun-class language. Every noun in Tuki belongs to a noun-class which determines the agreement-prefix markers that the noun will control on verbs and modifiers including the subject marker (SM). Consider (2) and (3) below:

- (2) a. *vakutu va nyam mbungu* 'women eat cassava'
 class 1
 women SM eat cassava
- b. *ndone i nyam mbungu* 'cows eat cassava'
 class 10
 cows SM eat cassava
- (3) a. **vakutu i nyam mbungu*
- b. **ndone va nyam mbungu*

In (2), the subject markers *va* and *i*, which represent AGR in INFL, agree in noun class with the NP's *vakutu* and *ndone* respectively. Any random assignment of subject markers to inappropriate NP's will result in ungrammaticality (cf (3)). In case the two NP's *vakutu* and *ndone* are absent in the sentence, but are recoverable metasyntactically, we will have well-formed empty categories in subject position:

- (4) a. $[e]_i$ *va_i nyam mbungu* 'they eat cassava'
 SM eat cassava
- b. $[e]_i$ *i_i nyam mbungu* 'they eat cassava'
 SM eat cassava

Riemsdijk and Williams [1986], following Chomsky [1981], have suggested that the agreement relation between AGR and the subject should be sanctioned by coindexation:

- (5) NP_i [_{INFL} [+tns] AGR_i]_{INFL} VP

It is assumed that in (5) either AGR_i c-commands NP_i and can govern it or that INFL "inherits" the subscript from AGR_i and acts as a proper governor whenever NP_i is not phonologically present. Whatever the assumption adopted, the empty category in subject position in Tuki is properly governed. Consequently, it does not violate the Empty Category Principle (ECP). The distribution of the class of

phonologically empty arguments, of which pro (the empty pronoun) is a member, is constrained by the ECP:

The Empty Category Principle (ECP): [_{NP} e] must be properly governed.

Government: X governs Y if and only if

- (a) X c-commands Y, and
- (b) X is an X⁰, i.e. X is a member of the class {N, V, P, A, INFL}, and
- (c) every maximal projection dominating Y dominates X.

Proper Government: X properly governs Y if and only if

- (a) X governs Y and X is lexical (N, V, A, or P), or
- (b) X locally A'-binds Y.

Rizzi [1982] assumes that in a null subject language, the INFL node containing AGR can function as a lexical proper governor, thereby licensing the occurrence of empty categories in subject position. This assumption seems to be born out in Tuki as evidenced by the grammaticality of the following sentence:

- (6) *andzu*_i [_{IP} *o bunganam* [_{CP} *x_i ee* [_{IP} *x_i a ma gwa*]]]
 who you think that SM p2 die

“who do you think that died?”

In (6), the WH-element *andzu* ‘who’ has been extracted from subject position over the lexical complementizer *ee* ‘that’. The fact that the construction is not ruled out by the ECP suggests that INFL properly governs the trace left in subject position. In a subsequent section, we will come back to the problem of the empty category in subject position in Tuki.

3. Resumptive Pronouns

Following Sells [1984a, 1984b, 1987], we will assume that resumptive pronouns are pronouns which appear in WH-movement constructions and which are directly bound by the operator in such constructions, as in the following Tuki sentences:¹

¹In Tuki empty pros referring to [+human] NP's are ungrammatical when they are not resumptive. For instance, the following sentence is illicit:

- (7) a. *mutu odzu_i ngu mu_i dingam*
 man who I him love
 ‘the man who I love him’
- b. *okutu odzu_i ngu mu bina na a_i*
 woman who I p1 dance with her
 ‘the woman who I danced with her’
- c. *mangadzu odzu_i nosi waa_i a dingam Puta*
 child who mother his SM loves Puta
 ‘the child who his mother loves Puta’

In Tuki, resumptive pronouns are morphologically identical to object pronouns. There are eight object pronouns in the language which can refer only to NP's bearing the feature [+human]. In other words, there are no object pronouns for [-human] NP's.² There are also no overt subject resumptive pronouns.

(8) **Tuki Object Pronouns**

Singular		Plural	
<i>n</i>	‘me’	<i>su</i>	‘us’
<i>o</i>	‘you’	<i>nu</i>	‘you’
<i>mu</i>	‘him/her’	<i>va</i>	‘them’
<i>a</i>	‘him/her’ (after preposition)	<i>abu</i>	‘them’ (after preposition)

-
- (i) **o mu dinga Pro* ‘you loved him’
 you p1 love him

It seems to be the case that A'-binding licenses the occurrence of resumptive pronouns. The other tests in the paper clearly indicate that the empty categories bound by WH-elements are *pro*. It might be argued that they are pronominal variables. The existence of such pronominal variables has been suggested by Marc Authier [1988]. Ken Safir [personal communication] suggests that since sentences like ‘John killed’ cannot be understood as ‘John killed him’, these gaps might be argued to be unruly traces rather than true pronouns. Empty pronominals referring to [-human] NPs are allowed in Tuki. This is hardly surprising given the unavailability of overt pronouns for [-human] NP's.

²We have no explanation as to why there are no object pronouns for [-human] NP's. Larry M. Hyman [personal communication] informs me that it is usual in many African languages to have object pronouns for [+human] NP's only.

3.1. WH-questions. Syntactic WH-movement in Tuki is optional. We are primarily concerned with WH-elements that are apparently moved from object position to A'-bar positions.

Consider the following questions:

- (9) a. *andzu_i [imgbeme y unam x_i]*
 who lion SM kills
 'who does the lion kill?'
- b. *andzu_i [imgbeme i mu_i nam]*
 who lion SM him kills
 'who does the lion kill him?'

In (9) the WH-word *andzu* 'who' which is [+human] can be associated either with a gap or a resumptive pronoun. In contrast, the WH-word *ate* 'what' which is [-human] can only be associated with a variable :

- (10) *ate_i [okutu a Mbara a nambam x_i]*
 what woman of Mbara SM cooks
 'what does Mbara's wife cook?'

We will assume throughout this paper (cf. also note 1) that *mu* in (9b) is a pronominal object clitic which identifies a *pro* in argument position and that the gap (x_i) in (9a) and (10) is an instance of A'-bound *pro*. Notice that the resumptive (object) pronoun *mu* in (9b) occurs to the left of the verb. Thus, the object gap and the overt resumptive pronoun occupy distinct syntactic positions. This situation will have no bearing on our analysis. In this particular respect, Tuki is much like French (*j'ai vu Marie* 'I saw Marie'; *je l'ai vue* 'I saw her') and unlike English. *Mu* is therefore a pronominal clitic that stands for a direct object NP, and that gets incorporated into the verb à la Baker [1988].

The contrast in behavior between *andzu* 'who' and *ate* 'what' with respect to the generation of resumptive pronouns will become crucial when we look at island phenomena in Tuki in a subsequent section.

3.2. Relativization

3.2.1. Headed Relative Clauses. In Tuki headed relative clauses, the head of the relative clause can be associated either with a resumptive pronoun or a variable:

- (11) a. [okutu] odzu_i Mbara a ma mu_i bana
 woman whom Mbara SM p2 her marry
 ‘the woman whom Mbara married her’
- b. [okutu] odzu_i Mbara a ma bana x_i
 woman whom Mbara SM p2 marry
 ‘the woman whom Mbara married’

Relative clauses in Tuki are characterized by their lack of pied piping:

- (12) [okutu] odzu_i Mbara a m enda na a_i na Purasi
 woman whom Mbara SM p2 go with her to Paris
 ‘the woman with whom Mbara went to Paris’

However, it is possible to relativize into an embedded relative clause (13) and an embedded question (14). This constitutes palpable evidence that apparent Complex Noun Phrase Constraint violations (involving or not involving gaps) can be analyzed as resumptive pronoun binding cases and therefore avoid being true island violations.

- (13) a. [okutu odzu] [_{CP} odzu_i [_{IP} Mbara i dzimam [_{NP} mutu [_{CP} odzu
 woman this whom Mbara SM knows man who
 [_{IP} a ma mu_i noba]]]]]
 SM p2 her beat
 ‘the woman that Mbara knows the man who beat her’
- b. [okutu odzu] [_{CP} odzu_i [_{IP} Mbara i dzimam [_{NP} mutu [_{CP} odzu
 woman this whom Mbara SM knows man who
 [_{IP} a ma noba x_i]]]]]
 SM p2 beat
 ‘the woman whom Mbara knows the man who beat’

- (14) a. [okutu odzu] [_{CP} odzu_i [_{IP} Mbara a kambim [_{CP} andzu [_{IP} a ma
 woman this whom Mbara SM wonders who SM p2
 mu_i berana]]]]]
 her call
 ‘the woman that Mbara wonders who called her’
- b. [okutu odzu] [_{CP} odzu_i [_{IP} Mbara a kambim [_{CP} andzu [_{IP} a ma
 woman this who Mbara SM wonders who SM p2
 berana x_i]]]]]]
 call
 ‘the woman that Mbara wonders who called’

Assuming that the derivation of relative clauses is an instantiation of the rule Move Alpha, Tuki relative clauses avoid being Subjacency violations because they are cases of resumptive pronoun binding:

- (15) a. mutu [_{CP} odzu_i [_{IP} Mbara a m udza [_{NP} maru ama [_{CP} ee
 man whom Mbara SM p2 tell story this that
 [_{IP} Puta a m una x_i]]]]]]
 Puta SM p2 kill
 ‘the man who Mbara told the story that Puta killed’
- b. tevere [_{CP} odzu_i [_{IP} Mbara a m udza [_{NP} maru ama [_{CP} ee
 table which Mbara SM p2 tell story this that
 [_{IP} Puta a m(u) ofa x_i]]]]]]
 Puta SM p1 throw
 ‘the table that Mbara told the story that Puta threw away’

So the Complex Noun Phrase Constraint violations are avoided irrespective of whether the position relativized can be associated with a resumptive pronoun or a variable. In (14b) for instance, since *tevere* ‘table’ is [-human], the position it has vacated cannot be filled with a resumptive pronoun. Nevertheless, the position violates the CNPC without any ungrammaticality resulting. We will come back to the problem of island violations in the next section. Furthermore, we will assume that Tuki relative clauses have the following structure:

- (16) [NP_i [CP [IP ... resumptive pronoun_i or [e]_i ...]]]

The relation between the head (NP) and the operator in COMP (CP) is one of coindexing [Chomsky 1982].

3.2.2. Free Relatives. In free relatives as well as in other Tuki WH-constructions, the resumptive pronoun may appear only when the position associated with it carries the feature [+human]. Thus, if the relativized position is [-human], the resumptive pronoun may not appear:

- (17) a. *ate_i Mbara a dingam ee [e]_i a kusa i diyam*
 what Mbara SM loves that he SM buys SM is expensive

‘what Mbara wants to buy is expensive’

- b. *Putu a m(u) ena ate_i Mbara a dingam ee [e]_i a kusa*
 Puta SM p1 see what Mbara SM loves that he SM buys

‘Putu saw what Mbara wants to buy’

- (18) *Putu a m(u) ena andzu_i Mbara a dingam ee [e]_i a (mu) bana*
 Puta SM p1 see who Mbara SM loves that he SM her marries

‘Putu saw who Mbara wants to marry (her)’

3.3. Summary of Section 3. In this section we have seen that topic NP or the head of the relative clause, when it is [+human], can be associated either with a resumptive pronoun or a gap. The resumptive pronoun may not appear if the head of the relative clause is [-human]. However, irrespective of the presence/absence of the resumptive pronoun, relativization in Tuki seems to constitute a case of resumptive pronoun binding. Following most current generative analyses stemming from the work of Chomsky [1977, 1981, 1982], the gapped examples introduced above would be analyzed as instances of “Move Alpha” leaving a variable (the trace left by WH-movement). Such an analysis disallows movement from island environments. While it is not surprising to find that the resumptive pronoun strategy illustrated above violates island constraints [Chomsky 1982; Georgopoulos 1985], the same result is unexpected under a variable analysis of the gapped examples. Nevertheless, Tuki allows such apparent violations, as is illustrated in the next section again for the Complex Noun Phrase Constraint, the WH-Island Constraint, the Constraint on Extraction Domain (CED), and the Sentential Subject Constraint.

4. Island Environments

In this section, we consider the island environments in Tuki. Chomsky [1977] has subsumed Ross's [1967] island constraints under the Subjacency Condition. Subjacency prohibits movement from island configurations.

Consider the following sentences:

- (19) a. *i mu [karate odzu] odzu_i [IP ngi idziman [NP mutu [CP odzu
it is book this that I know man who
[IP a ma tomena x_i iya ame]]]]
SM p2 send mother my
'it is this book that I know the man who sends—to my mother'*

- b. *i mu [iya ame] odzu_i [IP nga ti idzima [CP ate
it is mother my whom I neg know what
[IP x_i a nu nambam anenga aye]]]
SM f1 cook evening this
'it is my mother whom I don't know what (she) will cook this evening'*

In (19a), the focused NP *karate odzu* 'this book' is associated with a variable inside a relative clause. In (19b), the focused NP *iya ame* 'my mother' is extracted over the WH-element *ate* 'what'.

In the following sentence, extraction has taken place over an adverbial clause:

- (20) *i mu [manya ama] ama_i avan dze o timbita x_i, o yanam
it is food this before that you touch you must
o suwa amboo roo
inf. marker wash hands your
'it is this food that before you touch—, you must wash your hands'*

Example (20) violates the Condition on Extraction Domain [Huang 1982], and the data introduced so far appears to indicate that Tuki allows island violations. Tuki also seems to differ from other languages that violate certain island constraints. Rizzi [1982] shows that in Italian it is possible to extract from embedded questions while extraction from relative clauses is strictly prohibited; Rizzi then claims that the bounding node in Italian is S' (CP) rather than S (IP). Huang [1982] indicates that extraction from adjuncts is disallowed since they are not properly governed.

Having just seen that Tuki allows extraction from relative clauses, embedded questions (cf. 14b), and adjuncts, it seems appropriate to suggest that gaps in Tuki should not be analyzed as variables left by Move Alpha, but rather as null resumptive pronouns which do not involve movement, on analogy with the full resumptive pronoun strategy illustrated in the examples above. Further evidence for a parallelism between gaps and full resumptive pronouns is provided by the fact that it is possible to conjoin a clause containing a full resumptive pronoun and a clause containing a gap:

- (21) [_{IP} *Mbara a sesam* [_{CP} *andzu_i* [_{IP} *Puta a dingam x_i ka*
 Mbara SM asks who Puta SM loves then
 [_{IP} *Tsimi a mu_i benam*]]]]
 Tsimi SM him hates
 ‘Mbara asks who Puta loves and Tsimi hates him’

We assume that in the above sentence, the gap (x_i) and the clitic *mu* are A'-bound pronominals. We will come back to coordination in Section 7.

Assuming that apparent violations of Subjacency in Tuki do not involve trace-binding, it seems appropriate to elaborate on what a non-movement analysis of the constructions illustrated above would mean for the grammar. If indeed these constructions are not derived by WH-Movement, how did the WH-phrases reach their surface structure positions. It is plausible to posit that WH-phrases are base-generated in COMP in Tuki constructions involving resumptive pronoun binding. The possibility that WH-phrases can be generated in COMP position is raised in Chomsky [1982]. If WH-items could move to COMP in Tuki and leave traces that could optionally be spelled out as overt resumptive pronouns (as in Egyptian Arabic), we would expect the language to obey Bounding Theory. However, this is not the case. We conclude that WH-constructions examined so far involve resumptive pronoun binding and WH-phrases are base-generated in COMP position.

5. Weak Crossover at S-Structure

Overt resumptive pronouns do not exhibit weak crossover effects in Tuki:

- (22) a. *andzu_i [nosi waa_i] [a mu_i dingam x_i]*
 who mother his SM him loves
 ‘who does his mother love him?’

- b. *andzu*_i [*okutu* [*odzu*_j *a* *dingam* *x*_j]] *a* *mu*_i *benam*
 who woman whom SM loves SM him hates
 ‘who does the woman whom he loves hate him?’

Likewise, sentences containing gaps fail to exhibit weak crossover effects, providing further evidence that these gaps are pronominals, not variables:

- (23) a. *andzu*_i [*nosi* *waa*_i] [*a* *dingam* *x*_i]
 who mother his SM loves
 ‘who does his mother love?’
- b. *andzu*_i [*okutu* [*odzu*_j *a* *dingam* *x*_j]] *a* *benam* *x*_i
 who woman whom SM loves SM hates
 ‘who does the woman whom he loves hate?’

On analogy with their English counterparts, the sentences in (23) should be ruled out by the Bijection Principle [Koopman & Sportiche 1982] or the Leftness Condition [Chomsky 1976; Higginbotham 1980]:

The Bijection Principle (BP)

- a. Weak half: A quantifier can bind only one variable. (Violation results in semigrammaticality)
- b. Strong half: A quantifier must bind a variable. (Violation results in ungrammaticality)

The Leftness Condition states that a pronoun cannot be coindexed with a variable to its right. The fact that the constructions in (23) are licit seems to imply that the gaps are non-overt pronouns which may be phonetically realized when the position they are associated with is [+human]. Sentences such as (23) have important consequences for Safir's [1984, 1986] Parallelism Constraint on Operator Binding (PCOB):

(24) Parallelism Constraint on Operator Binding (PCOB)

If one local A'-bindee of O is [α lexical] and [β pronominal], then all local bindees of O must be [α lexical] or [β pronominal].

Safir's constraint rules out constructions in which a single operator binds two variables, one of which is a trace and the other a pronominal. Since we have argued that gaps in the above weak crossover configurations are non-overt

resumptive pronouns, it is plausible to suggest that all local A'-bindees of the operator *andzu* 'who' are [+pronominal]. If this argumentation proves to be accurate, both types of Tuki bindee would bear the feature [+pronominal], although one is overt and the other may be phonetically unrealized. If we compare how the PCOB and the BP fare with regard to the Tuki facts discussed, it seems quite evident that the PCOB is more successful in handling them. We will show in §8 the correlation between the absence of resumptive pronouns at LF and the occurrence of weak crossover effects at that level of representation. Since the PCOB, unlike the BP, is sensitive to the pronominal nature of the empty category corresponding to the WH-item in an A' position at S-structure, it is better equipped to handle the Weak Crossover facts in Tuki.

The "mixed" coordinations and weak crossover violations found in Tuki obtain in other languages. Sells [1984b] observes that the "mixed" coordinations and weak crossover violations are possible with resumptive pronouns even in languages which have EC gaps, like Swedish and Hebrew. Consider for instance the following Hebrew conjoined structures:

- (25) a. *ha' iš še_i Rina* [_{VP} *roca--*] *ve* [_{VP} *ohevet oto_i yoter mi kulam*
 the man who Rina wants and loves him more than anyone
- b. *kol professor še_i Dani* [_{VP} *roce le hazmin--*] *aval* [_{VP} *lo*
 every professor who Dani wants to-invite but not
maarix oto_i maspik
 esteems him enough

The above Hebrew constructions are similar to the Tuki empirical material in that there is an empty category in one conjunct and a resumptive pronoun in the other. Similar phenomena are observed in Palauan (see Georgopoulos [1983, 1984, 1985] for details). It seems to be the case then that the basic resumptive pronoun facts of Tuki do not constitute an isolated case in linguistic theory.

6. Anaphoric Binding

The claim that resumptive pronouns are syntactically bound is further supported by the analysis of anaphoric binding in the language. In Tuki, a lexical anaphor cannot precede and c-command the NP with which it is coindexed, as illustrated by the ungrammaticality of the sentence in (26):

- (26) * [*okutu waamate_i*]_j *udzam ee* [*e*]_i / *Isomo_i a ta mu_j/∅ dinga*
 woman his own says that he/Isomo SM neg her/∅ love
 'his own wife says that he/Isomo does not love her/∅'

In (26) the clause containing the antecedents [e]/*Isomo* is embedded within the clause containing the lexical anaphor *waamate* 'his own'. Irrespective of whether the antecedent is an NP or an empty pronominal, the sentence is illicit.

- (27) **vatu va kutu dzara maru m(a) Isomo_i*
 men SM prog. talk story of Isomo
 [*Okutu waamate_i]_j udzam ee [e]_i a mu ombee wa onumutu*
 woman his own says that he SM is bad of husband
 'People were talking about Isomo's problem. His own wife says that he is a bad husband.'

In (27) a possible antecedent in the immediately preceding discourse cannot bind a reflexive in the immediately following discourse. However, WH-fronted constituents can contain lexical anaphors bound by a following antecedent, as evidenced by the following construction:

- (28) [_{CP} *okutu waamate_i ate]_j [_{IP} o bunganam [_{CP} ee [_{IP} *Isomo_i a*
 woman his own what you think that Isomo SM
ta dzu mu_j dinga?
 neg still her love
 'which of his own wives do you think that Isomo no longer loves her?'*

It is commonly assumed within the standard transformational tradition that binding in (28) is done before WH-movement. Now if we question the subject of the clause containing the lexical anaphor *waamate* in (26), we obtain a grammatical sentence:

- (29) [*okutu waamate_i ate]_j udzam ee *Isomo_i a ta mu_j dinga*
 woman his own what says that Isomo SM neg her/Ø love
 'which of his own wives says that Isomo does not love her/Ø?'*

It is worth comparing the ungrammatical (26) to the grammatical (29). In (29) the resumptive pronoun *mu* or the gap is bound by an anaphor in an A-bar position, which is not the case for (26). Notice that (29) and (28) enjoy the same status of grammaticality, showing that both the resumptive pronoun and the gap can be bound by an item in a non-theta position and suggesting that the binding relationship between the WH-phrase and the resumptive pronoun/gap has taken place in the syntax. Thus, in Tuki, since resumptive pronouns and gaps can be

coindexed with a lexical anaphor located in a fronted WH-phrase, one can reach the conclusion that Tuki resumptive pronouns are syntactically bound at S-structure.

7. Coordination

In a preceding section, we argued that it was possible to conjoin a clause with a gap and a clause with a resumptive pronoun in Tuki (cf. (21) above), thereby showing that there exists a parallelism between gaps and resumptive pronouns in the language. Coordination is constrained crosslinguistically, and we did not mean to imply that Tuki violates the Coordinate Structure Constraint (CSC). Ross [1967] defines conjuncts of coordinate structures as islands:

- (30) **Coordinate Structure Constraint (CSC):** In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct. (Ross's §4.84).

In this section, we will see that although Tuki allows across-the-board extraction, it does not violate the Coordinate Structure Constraint. We will see also problematic cases of coordination that apparently show trespassing of the CSC.

Tuki uses different elements for coordination depending on the nature of the conjuncts. For instance, NP's are conjoined with *na* 'and' which can also function as a preposition and can mean 'at, in, on, to, with', whereas clauses are conjoined with *ka* 'then'. First, we consider what we term clausal coordination.

7.1. Clausal Coordination. As predicted by the CSC, it is impossible to extract one constituent of a conjoined structure in Tuki:

- (31) **ngi idzimam* [_{NP} *mutu* [_{CP} *odzu*_i [_{IP} *Putu a dingam* x_i *ka*
 I know man who Putu SM loves then
 [_{IP} *Mbara a benam Dima*]]]]
 Mbara SM hates Dima
 'I know the man whom Putu loves and Mbara hates Dima'

However, across-the-board extraction allows extraction from both conjuncts, provided that the affected elements in each conjunct be "identical" in syntactic category (see Williams [1978:36, (31)]). Consider in this respect (32b):

- (32) a. *ngi idzimam* [_{NP} *mutu* [_{CP} *odzu*_i [_{IP} *Putu a dingam x_i ka*
 [_{IP} *Mbara a benam x_i]]]]*

‘I know the man whom Puta loves and Mbara hates’

- b. *ngi idzimam* [_{NP} *mutu* [_{CP} *odzu*_i [_{IP} *Putu a mu_i/∅ dingam ka*
 [_{IP} *Mbara a mu_i/∅ benam]]]]*

‘I know the man whom Puta loves him/∅ and Mbara hates him/∅’

Sentence (32a) is grammatical because the same extraction rule has applied in both conjuncts. Notice that in (32b), the two conjuncts are the two VP's and that in each case the trace left by the extracted element can be replaced by a resumptive pronoun. Assuming Williams's requirement that WH-movement must apply across-the-board to an identical item in both conjuncts, then we have to conclude that WH-movement has affected both conjuncts in (32) and that the trace that is left behind is optionally spelled out as a resumptive pronoun. Given that the phonological realization of the trace cannot change its syntactic category in compliance with Williams's condition, both gaps and resumptive pronouns must be of the same syntactic category. That is they are both bound by the WH-word at S-structure.

We conclude here that Tuki does not violate the CSC, although it seems to violate consistently other island constraints in constructions containing resumptive pronouns. Georgopoulos [1985] observes the same behavior in Palauan and concludes that the CSC is a constraint different in kind from other constraints subsuming Subjacency. Scandinavian languages, too, observe the CSC, while many island constraints are violated [Engdahl and Ejerhed 1982].

7.2. NP Coordination. We will refer to coordination of two NP's in Tuki as NP coordination. As pointed above, Tuki uses for coordination of NP's *na* which sometimes functions as a comitative marker meaning ‘with’:

- (33) *Mbara endam na Puta na waspita*
 Mbara goes with Puta to hospital

‘Mbara goes with Puta to the hospital’

The facts that we are going to present will appear at first as violations of the Coordinate Structure Constraint, but in the end it will be shown that the CSC is not violated in Tuki. Consider the following paradigm:

- (34) a. *Mbara a m -una [Putu na Dima]*
 Mbara SM p1 kill Puta and Dima
 ‘Mbara killed Puta and Dima’
- b. *andzu_i Mbara a m una x_i na Dima*
 who Mbara SM p1 kill and Dima
 ‘who did Mbara kill and Dima?’
- c. *andzu_i Mbara a mu mu_i una x_i na Dima*
 who Mbara SM p1 her kill and Dima
 ‘who did Mbara kill her and Dima?’
- d. *andzu_i Mbara a mu una Puta na a_i*
 who Mbara SM p1 kill Puta and he
 ‘who did Mbara kill Puta and him?’
- e. **andzu_i Mbara a mu una Puta na x_i* (P-stranding is disallowed)
 who Mbara SM p1 kill Puta and
 ‘who did Mbara kill Puta and?’

Above, an element may be extracted out of a conjoined structure. But only the first conjunct may leave an empty category when it is extracted. When the second conjunct is extracted out of the conjoined NP, it must leave a phonologically realized proform which is incidentally the Subject Marker [a]. The sentence (34d) is accounted for below (cf. 39a,b).

On the other hand, a resumptive pronominal chain, (i.e. $cl_i \dots e_i$) can stand for the first conjunct when it is questioned, as illustrated in (34c). The same facts obtain with regard to the behavior of coordinate structures in relativization and focus constructions: one of the conjuncts of a conjoined structure can be relativized or focused. In each case, a resumptive pronoun can replace the first conjunct, while a subject marker can replace the second conjunct.

(35) Relativization

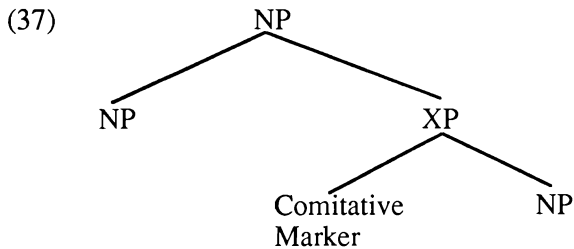
- a. [*okutu odzu*] *odzu_i Mbara a ma mu_i una x_i na Puta*
 woman this whom Mbara SM p2 her kill and Puta
 ‘this is the woman that Mbara killed her and Puta’

- b. [okutu odzu] odzu_i Mbara a m una x_i na Puta
 woman this whom Mbara SM p2 kill and Puta
 ‘this is the woman that Mbara killed and Puta’
- c. [okutu odzu] odzu_i Mbara a m una Dima na a_i/*∅
 woman this whom Mbara SM p2 kill Dima and her
 ‘this is the woman that Mbara killed Dima and her’

(36) **Focus Constructions**

- a. *i mu* [okutu odzu] odzu_i Mbara a mu mu_i una x_i na Puta
 it is woman this whom Mbara SM p1 her kill and Puta
 ‘it is this woman whom Mbara killed her and Puta’
- b. *i mu* [okutu odzu]_i odzu_i Mbara a mu una x_i na Puta
 it is woman this whom Mbara SM p1 kill and Puta
 ‘it is this woman whom Mbara killed and Puta’
- c. *i mu* [okutu odzu] odzu_i Mbara a mu una Dima na a_i/*∅
 it is woman this whom Mbara SM p1 kill Dima and she
 ‘it is this woman whom Mbara killed Dima and her’

It may appear that the first conjunct may be extracted freely in any of the constructions exhibited above, thereby violating the CSC. This fact may be very surprising in view of the absence of reported cases of CSC transgressions, even in languages that apparently violate Subjacency. It seems to be the case that coordination in Tuki, in particular coordination of NP's, functions differently from the one found in languages like English or French. Recall that the element used for coordination of NP's in Tuki is also a comitative marker. Suppose that the “connector” for Tuki NP's is in fact a comitative marker. Then an analysis of the above data would follow under the suggestions made by Schwarz [1987]. She reveals that to serve the semantic function of Coordination, many languages (such as Russian, Polish, Bulgarian, Latvian and Tagalog) have a Comitative Coordination Structure for NP coordination as illustrated below:



In (37), XP can be PP or NP, depending on whether the Comitative Marker is a lexical preposition or a case-marker. XP in (37) is sometimes extraposable, or can be argued to be an independent constituent. If we adopt the structure in (37), then the empirical material in (34) can be accounted for. Examples (34c, d) point to the fact that the second conjunct with the connector *na* can be separated from the first conjunct. If that proves to be true, the connector and the second conjunct are a simple case of extraposition. This reasoning is corroborated by the fact that *na* and the second conjunct can be preposed in (34a) as illustrated below in (38):

- (38) *na Dima [Mbara a m -una [Putu [_{XP} ...]]]*
 and Dima Mbara SM p1 kill Puta
 ‘and Dima, Mbara killed Puta’

It appears that the connector *na* is a Comitative marker which functions as a preposition (cf. 33). The view that the comitative marker *na* is a preposition would explain why it is only the first conjunct of a coordinate structure which can be moved and leave behind a trace (cf 34). Since the comitative marker *na* seems to be a preposition, movement of a second element of a coordinate structure is an instance of Preposition Stranding, a phenomenon which is strictly disallowed in Tuki. It appears that prepositions are not proper governors in Tuki. Consider (33) (repeated here for convenience) and (39):

- (33) *Mbara endam na Puta na waspita*
 Mbara goes with Puta to hospital
 ‘Mbara goes with Puta to the hospital’
- (39) a. **andzu_i Mbara endam na x_i na waspita*
 who Mbara goes with to hospital
 ‘who does Mbara go with to the hospital?’

- b. *andzu Mbara endam na a na waspita*
 who Mbara goes with her to hospital
 ‘who does Mbara go with her to the hospital?’

Example (39a), as expected, becomes grammatical if a resumptive pronoun occupies the position (after the preposition) vacated by S-structure movement of *andzu* ‘who’ (cf. 39b).

Thus, NP coordination in Tuki is simply a case of Comitative Coordination Structure which is very common among languages, rather than a violation of the Coordinate Structure Constraint. The connector *na* is a preposition-comitative marker which does not allow Preposition Stranding.

8. Formal versus Semantic Variables

So far, we have argued that gaps in Tuki WH-constructions should be analyzed as null resumptive pronouns. Optionally these gaps are realized phonologically when their A'-binders are [+human]. We also said that resumptive pronouns, null or overt, are “linked” to their A' antecedents at S-structure. It is generally assumed in generative grammar that A'-bound pronominals are variables. More precisely, A'-bound pronominals are semantic variables (cf. Higginbotham [1983:409] as well as Koopman & Sportiche [1982/83:fn. 1]; Hoji [1985:44]) as opposed to formal variables which are generally defined as follows:

- (40) **Variable:** A variable is an EC bound by an operator in an A' position (“a variable is an A'-bound EC”) (adapted from Riemsdijk and Williams [1986]).

For illustration, consider the following English sentence:

- (41) Everyone_i loves his_i mother.

The schematic S-structure and LF representations of (41) are given in (42):

- (42) a. **S-structure:** [_{NP} everyone_i] loves his_i mother
 b. **LF:** [_{IP} [_{NP} everyone] [_{IP} t_i loves x_i mother]]

According to (40), *t* being an empty category is a variable, which is bound to *everyone* in (42b). *His* in (42a) is also bound to *everyone*, i.e., it is construed as a variable bound to *everyone*, but it is not a variable since it is not linked to *everyone* nor is it an empty category.

Adopting here the distinction between formal and semantic variable (see Hoji [1985] for details), we can say that resumptive pronouns (null or overt) in Tuki WH-constructions are semantic variables different in nature from formal variables. Recall that we argued above that resumptive pronouns do not exhibit weak crossover effects in Tuki; and gaps were also shown to fail to exhibit such effects, suggesting that gaps and overt resumptive pronouns are of the same kind. Since syntactically bound resumptive pronouns are semantic variables, we conclude that semantic variables do not exhibit weak crossover effects in Tuki at S-structure as illustrated once again in the following sentence:

- (43) *andzu_i isa waa_i a mu_i/x_i dingam*
 who father his SM him/x loves
 ‘who does his father love him/x?’

Below we will present evidence that the distinction between semantic and formal variables is empirically motivated with regard to the weak crossover phenomena. In effect, we will show that formal variables exhibit weak crossover effects at LF in Tuki. Consider a WH-in-situ construction:

- (44) **karate ate udzam ee nosi waa_i a dingam [mwana ate]_i*
 book what says that mother his SM loves child what
 ‘which book says that his mother loves which child?’

Example (44) is ungrammatical, which suggests that coindexing is not possible between pronouns and unmoved WH-words to their right. Consider the LF representation of (44):

- (45) [*karate ate*]_i [*mwana ate*]_i [*x_i udzam ee nosi waa_i a dingam x_i*]]

In (45), the variable x_i is to the right of waa_i ‘his’, and the sentence is ruled out by the Leftness Condition (or the Bijection Principle). As opposed to the previous cases where the weak crossover effects were nonexistent, in (45) WH-movement has taken place at LF. Since the variable left by movement of *mwana ate* cannot be spelled out as a resumptive pronoun, x_i is a formal variable. The latter being bound by a pronoun to its left disqualifies the construction. So, up to now, we have encountered two cases to which the Leftness Condition has reacted differently: on the one hand, the interpretation of structures involving semantic variables bound at S-structure does not show weak crossover effects; on the other hand, the interpretation of structures involving formal variables bound at LF obeys the Leftness Condition.

Now what about the interpretation of quantifiers? Consider the following sentences with respect to the Leftness Condition:

- (46) a. **ee* [e]_i *a mu yedza i saseyam [mutu ongima]_i
 that he SM is mad SM annoys man every
 ‘that he is mad annoys everyone’*
- b. **iyere waa*_i *a dingam [mangadzu a sukuru ongima]_i
 teacher his SM loves child of school every
 ‘his teacher loves every student’*

In both sentences above, a bound variable reading between the pronoun and the quantifier phrase is impossible. The LF representations for both sentences are:

- (47) a. [*mutu ongima*]_i *ee* [e]_i *a mu yedza*] *i saseyam* x_i
 man every that he SM is mad SM annoys
- b. [*mangadzu a sukuru ongima*]_i [*iyere waa*_i *a dingam* x_i]
 child of school every teacher his SM loves

In the above structures, pronouns are coindexed with formal variables to their right; the Leftness Condition consequently disqualifies them. This is again *prima facie* evidence that Tuki exhibits weak crossover effects only at LF.³

³The Tuki weak crossover effects at LF may also be accounted for by what Reinhart [1987] calls the S-Structure Restriction on Binding. Assuming the GB framework of Chomsky [1981, 1982], Reinhart notices in substance (irrelevant details omitted) that all NP's are indexed freely, and the binding principles filter out inappropriate cases of coindexing. The theory distinguishes two types of coindexing relations, however, bound and unbound: a node α binds a coindexed node β iff α c-commands β at S-Structure. Unbound nodes are “free”, which means that a free node is not necessarily uncoindexed—it may be coindexed with an NP that does not c-command it. Reinhart [1987] gives the following sentences in which the pronoun may be coindexed with the full NP:

- (i) a. Each gardener_i talks to his_i plants
 b. Max_i talks to his_i plants
- (ii) a. *His_i friends voted for each candidate_i
 b. His_i friends voted for Max_i

Reinhart indicates that in (i) the coindexed pronoun is defined as bound, whereas in (ii) the coindexing is unbound. Reinhart [1983, 1985] had already argued that the above distinction between bound and unbound coindexing is sufficient to capture the distribution of bound variable anaphora. She argued that a pronoun may be interpreted as a bound variable iff it is syntactically bound at S-Structure. Therefore pronouns that are not bound at S-Structure may not corefer with a quantified NP, although pragmatic coreference with a referential NP is allowed (cf. the contrast

In sum, we have seen in this section a contrast between variables created at S-structure and variables created at LF. We have argued that resumptive pronouns, null or overt, are semantic variables bound at S-structure by elements in A' position; whereas formal variables are those created by LF-movement of WH-elements in situ and quantifiers. Notice that there seems to be a correlation between the presence of resumptive pronouns and the non-occurrence of weak crossover effects. The absence of resumptive pronouns at LF after the raising of quantified NP's and the movement of WH-items in situ inevitably triggers weak crossover effects. It is the above noted discrepancy between S-structure and LF which suggests that gaps in Tuki WH-constructions are *pro*. That suggestion is supported by our previous claim that parasitic gaps are licensed by resumptive pronouns (overt or non-overt) at S-structure in Tuki, since pronouns are coindexed at S-structure.

9. Conclusion

In this paper, we have shown that in Tuki, topic NP or the head of the relative clause can be associated either with a resumptive pronoun or a gap. Since Tuki allows violations of island constraints, we have claimed that gaps in Tuki should be analyzed as null resumptive pronouns which do not involve movement, on analogy with the full resumptive pronoun strategy available in the language. Further evidence for a parallelism between gaps and full resumptive pronouns was provided by the fact that it is possible to conjoin a clause containing a gap and a clause containing a resumptive pronoun. Full resumptive pronouns as well as gaps do not exhibit weak crossover effects in Tuki. This constitutes further evidence that these gaps are pronominals.

between (iia) and (iib)). Notice that Reinhart's distinction between bound and unbound coindexing can adequately describe the Tuki weak crossover cases at LF. In each case the antecedent does not c-command the pronoun at S-Structure.

Carol Georgopoulos (in a recent unpublished paper, "The ECP and Weak Crossover") analyzes the lack of WCO effects in Palauan at SS in ECP terms. She [personal communication] notes that her analysis would work in Tuki, too: since subject position is properly governed, sentences in which the antecedent precedes are OK but the ones waiting for LF movement are not. She assumes the conjunctive version of the ECP devised by Kayne [1984] and attempts to combine *pro* theory with the ECP. Moreover, she focuses on languages in which all argument positions are canonically governed. Tuki is not a case in point. It is not very evident, then, how her theory could accommodate the Tuki empirical material. Ken Safir [personal communication] informs me that the Tuki facts are in many ways similar to Hindi: WCO is only caused by LF-movement, not movement in Syntax.

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IGBO ADJECTIVES AS MORPHOPHONOLOGIZED RELATIVES

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Igbo adjectives are semantically, syntactically and morphophonologically derived. Underlyingly, they are relatives that are phonologized into a suppletive form. For this reason they cannot occur in predicative position, unlike adjectives in English. They are in two sets: the relative, polar set, which can be emphasized and further suppleted, and the non-relative, antipodal or taxonomic set, which cannot be emphasized, except perhaps by way of ideophonic periphrasis. Non-emphatic adjectives are also often ambiguous because of their inevitable incorporation of two copulas, one stative and neutral, the other active and cognate. One implication of all this is that 'Adj' is not a primitive syntactic category in Igbo and as such is not needed for its formal description. Another is that on the basis of formal behavioural criteria, a proper census of true adjectives in Igbo can now be taken.

1. Introduction

The class of Igbo adjectives is a limited one, with only five basic elements which include the following: *oma* 'good', 'beautiful', 'handsome'; *ojoḡ* 'bad', 'ugly'; *oča* 'white', 'bright'; *ojū* 'black', 'dark'; and a rather suspect one, *ukwu* 'big', 'large' (see Emenanjo [1978]). Other non-basic forms are *o_{ma}riča* (emphatic form of *oma*), *njoḡiri* (emphatic form of *ojoḡ*), *ajḡ* (a slightly stronger form of *ojoḡ*), and *nnukwuru* or *nnukwu* (emphatic form of *ukwu*). Some of the non-basic forms such as *o_{ma}riča* are dialectal while the basic forms are general.

2. Phonological Derivation of Adjectives

The following table sets out the phonological derivation of adjectives from verb roots through their cognate noun forms. (No attempt is made to formalize this with rules as that would go beyond the scope of this paper):

verb root	cognate noun	basic adjective	emphatic adjective
-ma-	<i>mma</i>	<i>oma</i>	<i>omaricha</i>
-jọ-	<i>njọ</i>	<i>ojọō</i>	<i>ajọ/njọkiri</i>
-cha-	<i>ọcha</i>	<i>ọcha</i>	-----
-ji-	<i>ọji</i>	<i>ọjiĩ</i>	-----
?	<i>ukwuù</i>	<i>ukwu</i>	<i>nnukwu(ru)</i>

Many patterns are extractable from this list, but the most interesting observation to make is that the adjectives *ọcha* and *ọjiĩ* have no emphatic alloforms. This fact is accounted for later in this paper. Also, *ukwu* has no identifiable verb-root source.

3. Adjectives in Associative Construction

An associative construction is one in a non-predicative form in which a modification is made of a head such that the modification is associated with it. It is an important fact of Igbo adjectives that they only occur in associative construction, unlike adjectives in English which can also occur in predicative constructions.

3.1. Basic forms in Associative Construction. Descriptive words in Igbo normally occur in post-nominal position in associative constructions, as the basic adjectives in the following:

- (1) a. *nwanyị oma* ‘beautiful/good woman’
b. **oma nwanyị*
- (2) a. *nwanyị ojọō* ‘ugly/bad woman’
b. **ojọō nwanyị*
- (3) a. *akwà ọcha* ‘white/bright cloth’
b. **ọcha akwà*
- (4) a. *akwà ọjiĩ* ‘black/dark cloth’
b. **ọjiĩ akwà*
- (5) a. *ụlọ ukwu* ‘large house’
b. **ukwu ụlọ*

Nothing normally intervenes between head and adjectival modifier except in a singular situation such as the following:

(6) *nwanyī ñkè ọma* ‘(selected) woman who is beautiful/good’

(7) *ụlō ñkè ọcha* ‘(selected) house which is white/bright’

The particle *ñkè* is one which distinguishes without pointing. In other words, *ñkè* makes non-deictic reference. Its behaviour is different from *ahụ* ‘that’, and *à* ‘this’ which do make deictic reference:

(8) *nwanyị ọma à* ‘this beautiful/good woman’

(9) *nwanyị ọma ahụ* ‘that beautiful/good woman’

However, while the basic and adjectival forms occur only post-nominally, some other nominal modifiers occur both post-nominally and pre-nominally, as is the case with the elements Emenanjo [1978] terms “qualifactive nouns”, e.g. *ogologo* ‘long’, ‘tall’, *mkpụmkpụ* ‘short’, *abadaba* ‘broad’, etc.

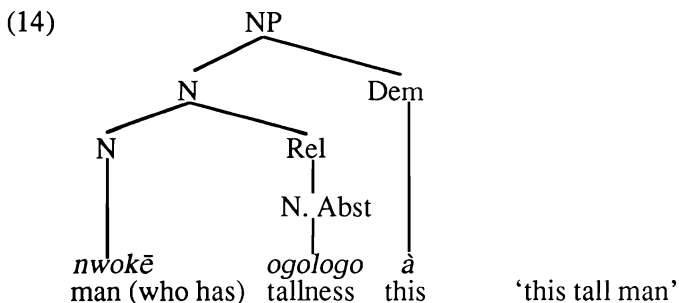
(10) *nwokē ogologo à* ‘this tall man’

(11) *ogologo nwokē à* ‘this tall man (emphatic)
or ‘the tallness of this man’

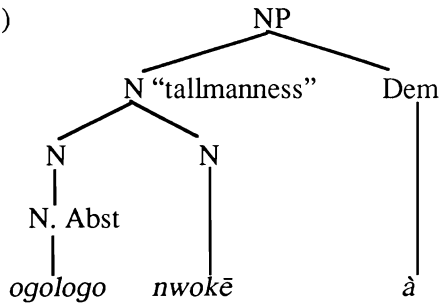
(12) *ụlō mkpụmkpụ à* ‘this short house’

(13) *mkpụmkpụ ụlō à* ‘this short house (emphatic)
or ‘the shortness of this house’

When qualifactive nouns precede their head nouns they become emphatic in their descriptive meaning or ambiguously suggest an inherent as opposed to a descriptive meaning. This can be illustrated using tree-diagrams as follows:

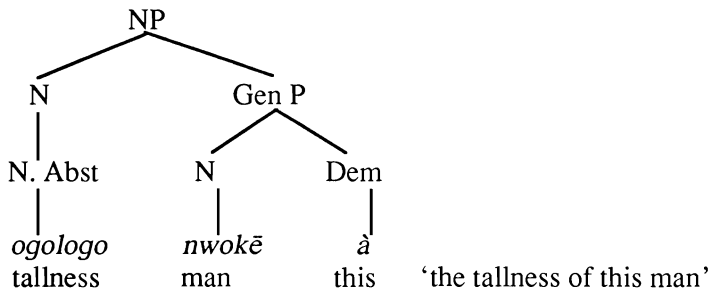


(15)



(type of) tallness man this 'this tall man (emphatic)'

(16)



'the tallness of this man'

From the diagrams above, it is clear that the ambiguity in the construction *ogologo nwokē à* derives from its two possible underlying tree-structures (15) and (16).

We thus conclude that while adjectives in their basic forms cannot be preposed, qualificative nouns may be preposed, in which case they become more emphatic.

3.2. Non-Basic forms in Associative Construction. Just as basic forms occur in post-nominal position, non-basic forms, when they exist in dialects, occur normally in the pre-nominal position, or, in rare usage, in the post-nominal position. As stated earlier, non-basic forms are emphatic. They therefore behave like qualificative nouns except for the fact that even when they occur in post-nominal position they still carry emphasis:

- (17) a. *ọmarịcha nwanyị à* 'this pretty woman (emphatic)'
 b. *nwanyị ọmarịcha à* " (but rare)
- (18) a. *njọkiri ụlọ ahụ* 'that ugly house (emphatic)'
 b. *ụlọ njọkiri ahụ* " (but rare)

- (19) a. *nnukwu ụlò ahù* ‘that large house (emphatic)’
 b. *ụlò nnukwu ahù* ” (but rare)

It is quite interesting to observe that *ọcha* ‘white’, ‘bright’ and *ojii* ‘black’ ‘dark’ have no emphatic, non-basic forms. The words *ọcha* and *ojii* are in absolute or antipodal/taxonomic opposition, while *oma* and *ọjọọ* are in relative or gradeable, polar opposition. In antipodal or taxonomic opposition, the opposing elements have their positions firmly fixed at extremes in such a way that an inherent emphasis would be redundant. In gradeable, polar opposition, on the other hand, positions are so fluid that one can always emphasize. Norms are relative, depending on speakers’ encyclopaedic knowledge of the element of description within the universe of discourse. The other item, *ukwu* ‘big, large’, is also gradeable even though we do not have any member in opposition with it.¹

4. Semantic Derivation of Adjectives

4.1. Basic forms. That adjectives are phonologically derived from nouns or their cognate verbs is clear enough from their phonological shape (see §1); but more importantly, they are also derived from them semantically. Specifically, the adjective is derived from a relativized predicate incorporating its cognate noun, as illustrated below:

- (20) *ụlò ahù ðì mmā* ‘that house is good’
 house that possesses goodness
- (21) *ụlò ahù ðì mmā* ‘that house that is good’
 house that that-possesses goodness

In these sentences *ði* is a copula; each could go with the cognate verb *mara* (made up of the root *-ma-* and the *-rV* factitive suffix, here realized as *-ra*) with a slightly different result:

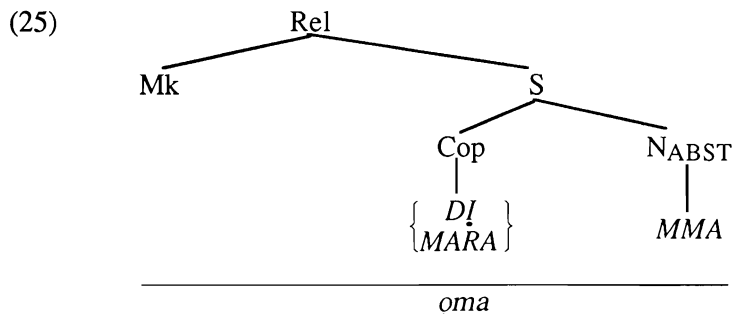
- (22) *ụlò ahù mārà mmā* ‘that house is beautiful’
 house that does-beauty beauty
- (23) *ụlò ahù mārā mmā* ‘that house that is beautiful’
 house that that-does-beauty beauty

¹The opposing item to *ukwu* is the ideophonic nominal *ntà* or *ntàkiri*. This in addition to the fact that *ukwu* has no corresponding cognate verb intensifies the suspicion that it is not an adjective.

Examples (20) or (22) are sentences with *mma* in a predicative position; examples (21) or (23) are phrases, noun phrases, with relative clauses containing *mma*. Relativization in Igbo is signalled by tone change (a floating high tone steps up the preceding and following tones if they are low). Relative clause reduction involves the elision of the copula and, in the case of adjective formation, suppletion. Either (21) or (23) can be thus reduced to (24):

- (24) *ụlọ ọma ahụ* 'that beautiful/good house'
 house (that is) beautiful/good that

Example (24) is therefore a shorter paraphrase of (21) and (23) with *ọma* as a suppletive form and the demonstrative postposing appropriately. In other words, *ọma* (Adj) semantically incorporates a Relative Marker (tone change), a copula (*dị* or *mara*), and the abstract noun *mma*. This can be stated using the following polycategorical lexical attachment format (see Gruber [1976]).²



That the semantic content of *ọma* incorporates the copular *dị* or *mara* and the relative tone marker can be seen from the unacceptability of the following:

- (26) a. **ụlọ ahụ dị ọma*
 b. **ụlọ ahụ ị ọmā*
- (27) a. **ụlọ ahụ màrà ọma*
 b. **ụlọ ahụ màrā ọmā*

²This representational format is due to Gruber's formalization of semantic content and lexical environment and his concept of incorporation. A continuous underline enclosing categories, e.g. EMPH, implies that it is obligatorily incorporated. Enclosing brackets '()' implies that it is optionally incorporated (see Gruber [1976]).

Thus, the elements already incorporated are not permitted in the environment of *oma*. This accounts for Emenanjo's [1978:71] observation that "adjectives can never be used after *-dī* 'have the qualities of' ". The other basic adjectives are derived in the same way: *oča* from the noun *oča* and the verbs *dī* and *chara*; *ojī* from the noun *oḍi* and the verbs *dī* and *jiri*; *oḵoḵo* from the noun *nḵo* and the verbs *dī* and *ḵoḵo*. The exception here is the fifth member *ukwu* which has no cognate verb and as such incorporates only the noun *ukwu* and the verb *dī*.

That adjectives alternatively incorporate the copula *dī* and the appropriate cognate copula is responsible for their inherent ambiguity as shown earlier. We may need to clarify this further. The phrase (28a) can yield either of the paraphrases (28b) and (28c):

- (28) a. *nwany* *oma* *ah* *u*
 b. *nwany* *ah* *u* *dī* *mmā* 'that good woman'
 c. *nwany* *ah* *u* *mārā* *mmā* 'that beautiful woman'

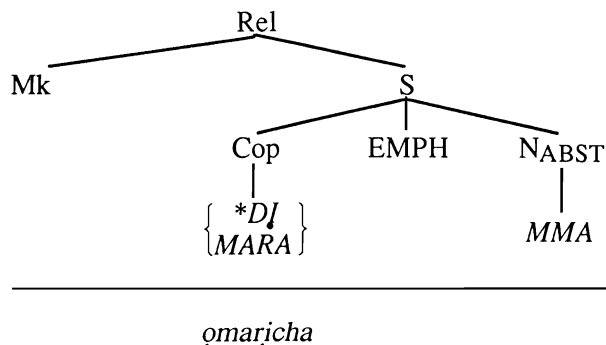
In (28b) *dī* is selected, ultimately yielding the adjective gloss 'good'; in (28c) *mara* is selected, yielding 'beautiful'. Example (28a) can therefore be seen to be ambiguous. All the other adjectives except *ukwu* are ambiguous for the same reasons, but *ukwu* has only one meaning 'large' because it incorporates only the copula *dī*.

4.2. Non-basic forms. The semantic derivation of non-basic forms becomes clear once the derivation of basic ones is shown. As said earlier, the difference between the basic and the non-basic adjectives is in the latter's incorporation of emphasis (and their greater syntactic mobility). It does appear, however, that emphatic, non-basic forms must incorporate one, and only one, copula. Thus, in addition to emphasis, *oḵarīcha* incorporates only *mara*, *nḵoḵiri* incorporates only *ḵoḵo*, *aj* incorporates only *dī*, and *nnukwu(ru)* necessarily incorporates only *dī*. These facts can be represented rather casually thus:

- (29) a. Mk + EMPH + $\left\{ \begin{array}{l} \text{mara} \\ *dī \end{array} \right\} + nma = \left\{ \begin{array}{l} \text{oḵarīcha} \text{ 'extremely beautiful'} \\ \text{—} \text{ 'extremely good'} \end{array} \right\}$
 b. Mk + EMPH + $\left\{ \begin{array}{l} \text{ḵoḵo} \\ dī \end{array} \right\} + nḵo = \left\{ \begin{array}{l} \text{nḵoḵiri} \text{ 'extremely ugly'} \\ \text{aj} \text{ 'extremely bad'} \end{array} \right\}$
 c. Mk + EMPH + $\left\{ \begin{array}{l} \text{—} \\ dī \end{array} \right\} + ukwu = \left\{ \begin{array}{l} \text{—} \\ \text{nnukwu(ru)} \text{ 'extremely large'} \end{array} \right\}$

A sample lexical attachment to demonstrate the semantic content of non-basic forms is shown below (full account is given in §5):

(30)



Once again, the taxonomic colour terms *o_{cha}* and *o_{ji}* cannot be emphasized through suppletion. It does appear in any case that the concepts they represent can be intensified by way of some appropriate ideophonic periphrasis, as in the following sentences:

(31) *o* *nà* *àcha* *fàà* 'it shines very brightly'
 it does shine *fàà*

(32) *o* *nà* *èji* *kpi* 'it is very deep black or dark'
 it does darken *kpi*

The ideophones (underlined) here function as adverbial intensifiers. It is not yet certain what the relationship is between semantic field character and ideophonic intensification. If we recognize that the two adjectives under consideration are physical (visual) while the others are mental, then we may surmise that suppletive emphasis and ideophonic intensification function in two opposing semantic field areas, the first in the mental and the second in the physical fields.

5. Formal Syntactic Description

A fragment of Igbo grammar that would conveniently handle the observations made is given below. The subcomponents include a phrase-structure, a transformational and a lexical component.

Phrase-Structure Rules

(a) NP → N (Det) (Rel)

(b) Rel → Mk + S

(c) S → NP VP

(d) VP → Cop + (EMPH) + N_{ABST}

Comment: there is no adjective in the base. Adjectives are the result of incorporation of Relative Marker into a suppletive form (see below).

Transformational Rules

N Mk NP Cop N_{ABST}

1 2 3 4 5 ⇒

(e) T₁(obl) 1 2 ∅ 4 5 (when N and NP are identical)

(f) T₂(opt) 1 ∅ {4 + Tone} 5
 { ∅ }

Comment: lexical insertion for adjectives takes off obligatorily after T₁. T₂ yields all surface forms of non-adjectival relatives, with the null option selectable when N_{ABST} is a qualificative noun, i.e. *ogologo*, etc., but not when it is a cognate nominal (*mma*, *njọ*, etc.)

(g) T₃(opt) N EMPH N_{ABST}

1 2 3 ⇒

2 3 1 (when N_{ABST} is not taxonomic)

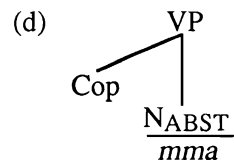
Comment: EMPH is obligatorily required for pre-posing to occur because the position of N_{ABST} relative to N(the head) determines whether or not the abstract noun is emphatic.

Lexical Entries ((a) to (j) are partial)

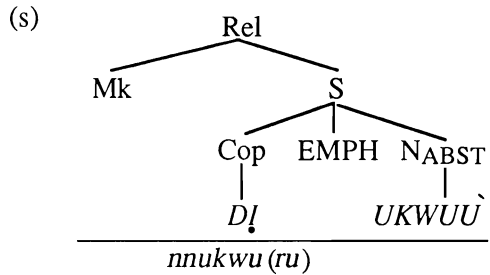
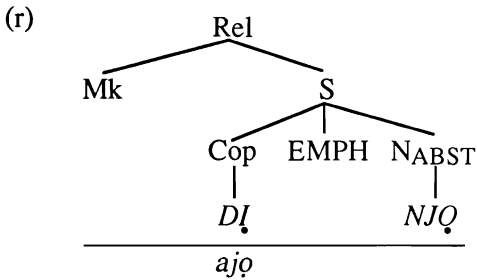
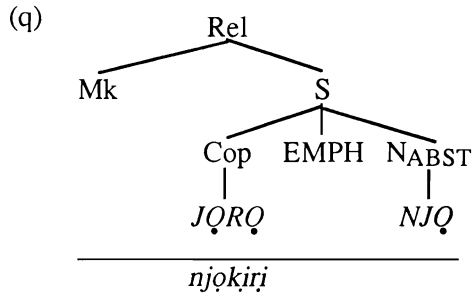
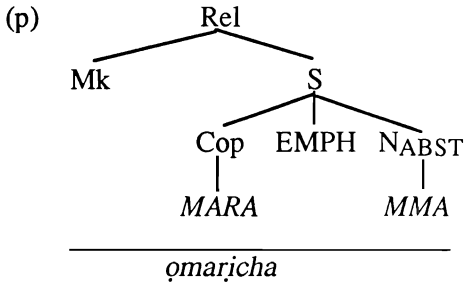
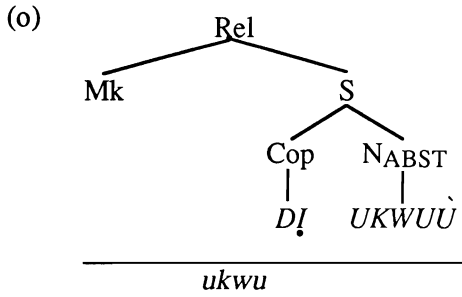
(a) N
nwanyì

(b) Cop
dj

(c) Cop
mará



- (e) A VP node branches into Cop and NABST. NABST dominates òjì.
- (f) A VP node branches into Cop and NABST. NABST dominates njò.
- (g) A VP node branches into Cop and NABST. NABST dominates òcha.
- (h) (EMPH) NABST
ogologo
- (i) (EMPH) NABST
mkpumkpụ
- (j) A VP node branches into Cop and NABST. NABST dominates ukwuù.
- (k) A Rel node branches into Mk and S. S branches into Cop and NABST. Cop dominates {DI}. NABST dominates {MARA} MMA. A horizontal line is below the tree, with òma below it.
- (l) A Rel node branches into Mk and S. S branches into Cop and NABST. Cop dominates {DI}. NABST dominates {JORO} NJÒ. A horizontal line is below the tree, with òjòò below it.
- (m) A Rel node branches into Mk and S. S branches into Cop and NABST. Cop dominates {DI}. NABST dominates {CHÀRA} ÒCHA. A horizontal line is below the tree, with òcha below it.
- (n) A Rel node branches into Mk and S. S branches into Cop and NABST. Cop dominates {DI}. NABST dominates {JIRI} ÒJI. A horizontal line is below the tree, with òjĩ below it.



Comment: Cop is in the left environment of *mma*, *njọ*, *ọcha*, *ọji*, and *ukwuù*, but is not incorporated by them. Rather, it is incorporated by *ọma*, *ọjọf*, *ọjī*, and *ukwu*. This fact is indicated by the extent of the underline in each case. The words *sogologo* and *mkpumkpụ* optionally incorporate EMPH, indicated by ‘()’.

6. Conclusions

Basic-form adjectives in Igbo are derived from nouns, which are themselves derived from verbs by a simple morphological process (not discussed). More specifically, adjectives are predicates incorporating an abstract object nominal, a predicating copula, and a relative marker into a suppletive form. Adjectives in Igbo therefore do not exist in the base component, even though in a casual sense they are words in the language. That is, “adjective” is not a syntactic category in Igbo and as such is not needed for the formal grammatical description of the language. It is nevertheless a notional (semantic) category and therefore participates in perception and conception since it exists at a deep rather than a surface level. Carrell [1970] does not recognize this as she uses the category “Adj” in her syntactic derivations. On the other hand, Oluikpe [n.d.] is equivocal on this issue. He apparently recognizes the abstractness of adjectives when he derives them from underlying relatives (p. 66) though at the same time he incorporates “Adj” as a category in his lexical rules (pp. 41 ff).

Basic-form adjectives all incorporate two copulas, *dī* and an appropriate cognate verb. This is with the exception of *ukwu* which has no cognate verb. As a result, forms incorporating two copulas are ambiguous while *ukwu* is not.

Again, with the exception of *ukwu* adjectives consist of two pairs of antonyms, *oča* ‘white’, ‘bright’ vs. *ojī* ‘black’, ‘dark’ and *oma* ‘beautiful’, ‘good’ vs. *ojoḡ* ‘ugly’, ‘bad’. The first pair is antipodal or taxonomic, while the second is polar or relative.

Basic-form adjectives invariably occur in post-nominal position like other nominal modifiers with the exception of qualificative nouns. Polar adjectives can be emphasized, in which case they occur in a suppletive form. When suppleted, emphatic adjectives occur preferentially in the pre-nominal position. Antipodal adjectives cannot be emphasized since they are by nature absolute in their designation. It does appear, however, that a parallel notion of intensification can be achieved by way of an appropriate ideophonic periphrasis. While (with the exception noted) basic-form adjectives incorporate two copulas, emphatic forms appear to mandatorily incorporate only one. The reason for this is not yet clear. As a result of this they lack the form of ambiguity inherent in basic forms.

Qualificative nouns such as *ogologo* behave partially like emphatic adjectives except that they bear emphasis only in the pre-nominal position whereas emphatic-form adjectives still bear emphasis even in the rare situations when they occur post-nominally. Besides, qualificative nouns can also be used in predicative position while emphatic-form adjectives often cannot.

There are gains to derive from both our formalism and our results. In the first place, an elegant account is given of aspects of the semantics of the Igbo adjective as well as its syntactic dispositions. Other gains include a reduction in the number of primitive syntactic categories as well as in the number of rules in the transformational component, especially “spelling out” rules. In addition, a greater unity is

achieved between syntax and semantics by reducing interpretive semantic markers in the sense posited by Katz and Fodor [1963], Katz [1972], among others.

Finally, it will be interesting to find out how adjectives behave in other languages in comparison with our findings in this paper. Discussing adjectives and adjectival intensifiers in Hausa in relation to their syntactic peculiarities, Newman [1968:109] states as follows:

adj(ective) + int(ensifier) must follow the head noun whereas an adj without an int may occur either before or after the head noun, before being the normal position (intensifiers are underlined):

- (1) *rago fari fat* 'a snow white ram'
- (2) **fari fat rago*
- (3) *farin rago* 'a white ram'
- (4) *rago fari* 'a white ram (with contrastive emphasis on 'white')'

Newman's data is quite revealing. Intensifiers can occur directly with a colour adjective, unlike the situation in Igbo. As obtains in Igbo, position relative to head noun can signal emphasis. However, unlike Igbo the postnominal position is the emphatic position. As holds in Igbo, emphasis is signalled phonologically through suppletion. However, suppletive emphasis, unlike Igbo, involves reduction in phonological complexity. Finally, very much unlike Igbo and against normal expectations, a presumably taxonomic term is suppleted. Newman however adds (footnote) that "grammatically 'adjectives' in Hausa such as *fari* 'white' ... are really a subclass of noun." It will be interesting to further investigate the how's and why's associated with adjectives in these and other languages.

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INTERNAL EVIDENCE FOR FINAL VOWEL LOWERING IN HAUSA*

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Internal factors involving phonotactic asymmetries and irregular morphological alternations suggest that final */uu/ in Hausa historically lowered to /oo/ when the preceding syllable contained /aa/, e.g. *kwààdoo 'frog' < *kwàadu. (Note: L tone is indicated by a grave accent, H tone is left unmarked. Long vowels are indicated by double letters.) The aim of this paper is to present evidence supporting this proposal and to suggest implications of the historical vowel change for one of Hausa's many plural formations, the ablaut plural. (For background studies on the history of vowels in Hausa and Chadic, see Barreteau [1987], Frajzyngier [1986], Newman [1979b], Parsons [1970], Schuh [1984], and Wolff [1983].)

1. Phonotactic Asymmetry

Hausa has five vowels—*i*(*i*), *e*(*e*), *a*(*a*), *o*(*o*), *u*(*u*)—all of which can occur in word-final position, e.g.

(1) <i>hancìi</i>	'nose'	<i>kiifii</i>	'fish'
<i>shingee</i>	'fence'	<i>beebee</i>	'deaf mute'
<i>rùmfaa</i>	'shed'	<i>raanaa</i>	'sun'
<i>bàngoo</i>	'a gourd'	<i>zoomoo</i>	'hare'
<i>ganduu</i>	'farm'	<i>tuuruu</i>	'stubborn person'

When one looks at disyllabic words of the form *CaaCVV*, however, one finds distributional asymmetries which previously have not been noticed. Whereas the

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sequences *aa...ii*, *aa...ee*, *aa...aa*, and *aa...oo* are quite normal, the *aa...uu* sequence with the final high back vowel is surprisingly restricted, e.g.

- (2) *bàakii* ‘mouth’, *daagii* ‘digging rod’, *gaashii* ‘hair’, *ràafii* ‘stream’, etc.
baabèe ‘locust’, *daalèe* ‘lavish living’, *saashèe* ‘section’, *waakee* ‘beans’, etc.
faatàa ‘hide’, *kàazaa* ‘hen’, *naamàa* ‘meat’, *raanaa* ‘sun’, etc.
gaabòo ‘simpleton’, *gwaaloo* ‘grimace’, *ràagoo* ‘ram’, *yaaròo* ‘boy’, etc.
baaʔuu ‘hyena’, *fàaruu* ‘the tree *Odina barteri*’, *gàaʔuu* ‘town wall’

Plurals with final *-uu* preceded by */aa/* exist, e.g. *kaanuu* ‘heads’, *maasuu* ‘spears’, as do verbal nouns, e.g. *kaamùu* ‘catching’, *saamùu* ‘getting’. There are also *aa...u* words where the final *-u* is short e.g. *kàawu* ‘uncle’, *dàazu* ‘right now’, not to mention the numerous medio-passive “grade 7” verb forms, e.g. *tàaru* ‘assemble’, *fàaru* ‘happen’, *kàamu* ‘be caught, infected’. But with simple monomorphemic stems, examples of *aa...uu* are extremely rare, and those that do occur are not basic native words. The word *gàaʔuu*, for example, is a loanword from Kanuri, and *baaʔuu*, whose source is not identifiable, also appears to be a loanword, in that it contains the rolled */r̄/* instead of the native flap and because it is a feminine word ending in a vowel other than */aa/*. The one possibly native word exhibiting the *aa...uu* pattern, *fàaruu*, stands in sharp contrast to the thirty-five or so examples of everyday common nouns containing *aa...oo*. The explanation that I would offer to account for the absence of words with the vowel sequence *aa...uu* and the overabundance of those with *aa...oo* is that there was a historical sound change of final **/uu/* to */oo/* which was conditioned by */aa/* in the preceding syllable. As a result, words originally of the form **CaaCuu* now appear as *CaaCoo*.

2. Abstract Nouns

Hausa has a number of related suffixes *-(n)taa*, *-(n)cii*, *-(n)takaa*, etc. which are used to form abstract nouns, e.g. *jàaʔùmatakàa* ‘bravery’ < *jaaʔùmii* ‘a brave person’. Disyllabic nouns generally use an allomorph of the suffix containing the */n/* and add it to the full lexical stem including the final vowel. (Shortening of vowels in closed syllables and consequent centralization of short */e/* and */o/* to */a/* are phonologically determined.) For example,

- | | | | | |
|--------------------|----------------------|---|----------------|--------------|
| (3) <i>gwàntàa</i> | ‘expertise’ | < | <i>gwàanii</i> | ‘expert’ |
| <i>bèebàntakàa</i> | ‘muteness’ | < | <i>beebee</i> | ‘deaf mute’ |
| <i>bàràntakàa</i> | ‘service’ | < | <i>baràa</i> | ‘servant’ |
| <i>angwancìi</i> | ‘being a bridegroom’ | < | <i>angòo</i> | ‘bridegroom’ |

<i>ràgwàntakàa</i>	‘laziness’	< <i>ragoo</i>	‘slacker’
<i>zùmùntaa</i>	‘relationship’	< <i>zumùu</i>	‘friend, cousin’

A few nouns ending in *-oo* exhibit an irregular vowel change when the abstract suffix is added, e.g.

- (4) *sàabùntaa* ‘freshness, newness’ < *saaboo* ‘new’
baakùncii ‘hospitality, being a stranger’ < *bàakoo* ‘guest, stranger’
yàarìntaa (< */yàarùntaa/*) ‘childishness’ < *yaaròo* ‘child, boy’
 (cf. also *yaarinyàa* ‘girl’ < */yaaru-nyàa/*, with the feminine derivational suffix *-nyàa* [Newman 1979a])

When one observes that all of these examples have a long /aa/ in the first syllable, an explanation for the vowel alternation immediately presents itself, namely that formerly, these words all had the form *CaaCuu*, i.e. **bàakuu*, **saabuu*, **yaaruu*. The final **/uu/* was retained in abstracts and other derivational forms involving suffixation (such as the verbalizer *-ntaa*, e.g. *saabùntaa* ‘renew’) whereas in word-final position the **/uu/* lowered to */oo/*, e.g.

- (5) **saabuu + ntaa* → *sàabùntaa* ‘newness’; **saabuu* > *saaboo* ‘new’.

3. Plurals

Most Hausa plural formations involve the addition of a suffix with an associated tone pattern, e.g. *zoomoo* ‘hare’, pl. *zoomàayee*; *keesòo* ‘grass mat’, pl. *keesunàa*; *kàakaa* ‘grandparent’, pl. *kàakànnii*. Some basic disyllabic nouns, on the other hand, form their plurals by final vowel replacement, e.g. *faatàa* ‘hide’, pl. *faatuu*; *raamii* ‘hole’, pl. *raamuu*; *kàazaa* ‘hen’, pl. *kàajii*; *tsàakoo* ‘chick’, pl. *tsàakii*. Notice that the singular nouns operating ablaut plurals generally end in */ii/*, */aa/*, and */oo/*, a phonologically unnatural class. If, however, one interprets the */oo/* in these words as deriving historically from **/uu/*, as suggested above, then the class becomes quite regular. That is, the formation consists in taking singulars ending in one of the prime vowels */ii/*, */aa/*, or */uu/* and altering them by switching to another prime vowel, e.g.

- | (6) Singular | Plural | |
|---------------------------------------|----------------|------------|
| <i>*bàakuu</i> (now <i>bàakoo</i>) | <i>bàakii</i> | ‘stranger’ |
| <i>*kwàadu</i> (now <i>kwàadoo</i>) | <i>kwàadii</i> | ‘frog’ |
| <i>*ƙwàaruu</i> (now <i>ƙwàaroo</i>) | <i>ƙwàarii</i> | ‘insect’ |

	*tsàakuu (now tsàakoo)	tsàakii	‘chick’
	*zàabuu (now zàaboo)	zàabii	‘guinea-fowl’
cf.	maashii	maasuu	‘spear’
	raamii	raamuu	‘hole’
	fàaraa	fàarii	‘locust’
	kàazaa	kàajii	‘hen’
	naamàa	naamuu	‘animal’
	yaatsàa	yaatsuu	‘finger’

Whereas all common nouns of the shape *CaaCuu would have changed into CaaCoo, not all oo-final words would necessarily have come from earlier forms with final */uu/. Some would have ended in /oo/. These words with an etymological final /oo/ would not have been eligible for the ablaut plural; instead they would have formed plurals by suffixation, as is still the case, e.g. *kòtsoo* ‘type of drum’, pl. *kootsunàa*; *ràagoo* (NOT < *ràaguu) ‘ram’, pl. *raagunàa* (cf. the synchronically similar word *zàaboo* ‘guinea-fowl’ in (6) above).

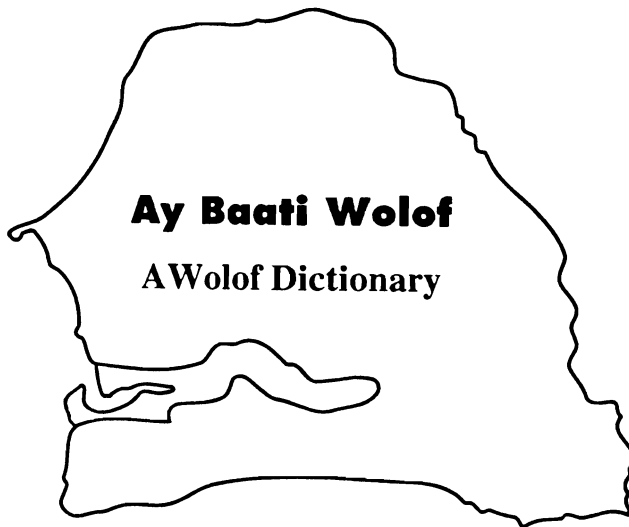
4. Conclusion

In this brief communication I have suggested that Hausa historically underwent a phonologically conditioned change of final */uu/ to /oo/ in the environment of /aa/ in the preceding syllable. This historical process provides an explanation for vowel alternations in the formation of abstract nouns and in the phonologically skewed distribution of nouns that form ablaut plurals.

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