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EMPTY OPERATOR RAISING IN KITHARAKA*

Carolyn Harford
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The Kenyan Bantu language Kitharaka (E.54) has a biclausal construction in which a verb with an athematic subject takes a finite complement. A referential NP in the matrix subject position may acquire its thematic role through linkage with an argument at a lower level of embedding. The paper presents evidence that this construction, referred to as Empty Operator Raising, involves empty operator movement, although it is also semantically similar to Raising-to-Subject. If the matrix subject is distinct from the subject of the nearest embedded clause, this clause must contain a clefted NP. The author proposes that this clefting is a distancing strategy to prevent an empty operator in SPEC/CP from binding the embedded subject position, to avoid forming an illicit chain with the matrix subject.

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0. Introduction

Kitharaka, a Bantu language spoken in the Tharaka Division of Tharaka-Nithi District in Kenya, has a biclausal construction in which a verb with an athematic subject takes a finite complement. A referential NP in the athematic matrix subject position may receive its thematic role through linkage with any argument at a lower level of embedding. This construction will be referred to as Empty Operator Raising (EOR) in anticipation of an analysis which involves empty operator movement and because of the semantic similarity of EOR predicates to Raising to Subject (RS) predicates in English and other languages.

The paper consists of the following sections. Section 1 describes EOR. Sections 1.1 and 1.2 discuss, respectively, thematic transmission and clefting in EOR. Section 2 proposes an analysis of EOR. Section 2.1 compares EOR to constituent questions in Kitharaka, while section 2.2 compares it with WH-movement. Section 3 concludes.

1. EOR in Kitharaka

This section describes EOR in Kitharaka. This construction, like similar constructions in other Bantu languages [cf. Perez (Harford) 1985], takes a finite complement in both its non-“Raised” and “Raised” variants, as seen in examples (1a) and (1b).¹ A non-finite complement is possible only if “Raising” has taken place;² this variant will not be discussed in this paper.

¹ The examples in this paper are rendered using the standard orthography of Kimeru, the dialect cluster whose members are the closest relatives of Kitharaka, with one exception: I have borrowed the symbol “~” from Gikuyu to distinguish the seven vowels common to all of these languages. Although detailed phonetic work has yet to be done on Kitharaka, “i” may be tentatively identified as [e], “e” as [ɛ], “ū” as [o], “o” as [ɔ]. Also, “b” may be identified with [β], “g” with [ɣ], and “th” with [ð]. Tones are marked where available. Acute accent indicates high tone; grave accent low tone. Ungrammatical examples are not marked for tone.

The following abbreviations are used throughout:

CONT	continuous	OM	object marker	RPST	remote past
FV	verb final vowel	PASS	passive	RS	raising-to-subject
HAB	habitual	PRF	perfect	SM	subject marker
INF	infinitive	PR	predicative	ST	stative
LOC	locative	PST	past	VS	verb stem
NPST	near past	REC	reciprocal		

A slash in the glosses indicates fusion of morphemes in this otherwise agglutinative language. Numbers in all examples are noun class numbers and follow the numbering system for Bantu noun classes originated by Bleek [1862] and now referred to as the Bleek-Meinhof system.

² An example of a non-finite complement when “Raising” has taken place:

mù-ntù úyú n-á-íy-ìk-èèn-è í-kù-ìy-à m-bùrì
 1-person this.1 PR-SM.1-know-ST-REC/PRF-FV PR-1-steal-FV 10-goats
 ‘This person is known for stealing goats.’

- (1) a. *í-kw-iy-ìk-èèn-è* *àtĩ mù-ntù ù-yù n-áá-ìj-ìr-è* *m-bùrì* ³
 PR-SM.17-know-ST-REC/PRF-FV that 1-person this-1 PR-SM.1-steal-PST-FV 10-goats
 ‘It is known that this person stole goats.’
- b. *mù-ntù ù-yù n-áá-ìy-ìk-èèn-è* *àtĩ n-áá-ìj-ìr-è* *m-bùrì*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that PR-SM.1-steal-PST-FV 10-goats
 ‘This person is known to have stolen goats’

The embedded clauses in both examples (1a) and (1b) contain a tensed verb whose subject marker (SM) agrees obligatorily with the noun class of the matrix subject.⁴ In examples such as (1b), it is not possible to have distinct referential subjects in the matrix and embedded clauses. Thus, example (2), in which the subject *antũ* ‘people’ of the matrix verb is distinct from *muntũ ũra* ‘that person’, subject of the embedded clause, is ungrammatical.

- (2) **a-ntũ i-ba-iy-ìk-èèn-è* *aĩ mu-ntũ ũ-ra*
 2-people PR-SM.2-know-ST-REC/PRF-FV that 1-person 1-that
n-aa-raa-um-ìr-è nja ya n-thĩ igoro
 PR-SM.1-NPST-leave-PST-FV outside of 9-country day before yesterday
 ‘People are known that that man left the country the day before yesterday’

There is an exception to this generalization. The matrix and embedded subjects may be distinct, but two conditions must be met, as listed in (3) and illustrated by the example in (4).

³ I refer to the first morpheme of both the matrix and embedded verbs as the predicator (PR), a term I owe to Patrick R. Bennett. Bergvall [1987] uses the term “assertion marker” for a cognate morpheme in Gikuyu. Clements [1985] refers to this morpheme as the focus particle. The PR takes the form *i-* preceding a consonant and *n-* preceding a vowel, with lengthening of the vowel. It appears on both verbs and nouns, with significant syntactic effects, as will be seen below.

The stative extension in examples (1a, b) is a verbal morpheme which intransitivizes a verb, in a way similar to the passive. In this verb, and in another in the examples in this paper, it is found in combination with the reciprocal extension, which carries no meaning in this context. This “spurious reciprocal” phenomenon, in which the reciprocal occurs meaninglessly with the stative, is also found in Kiswahili [Cf. Mchombo [1990] on the stative extension in Chichewa.]

⁴ Kitharaka is similar in many respects to Bantu languages already described in the generative literature (cf., for example, Bennett [1970], Bergvall [1987], Bokamba [1981], Bresnan and Mchombo [1987], Bresnan and Moshi [1990], Clements [1984], [1985], Demuth and Johnson [1989], Demuth and Gruber [1994], Perez (Harford) [1985]), and readers are referred to these sources and the references therein for further information. Other sources on this language include Mbeeria [1979, 1981] and Lindblom [1914].

- (3) a. The matrix subject must be linked to an embedded position other than the subject.
 b. There must be a clefted preverbal NP in the embedded clause which is linked to the embedded subject (represented by the subject marker on the verb).

- (4) *mù-ntù ù-yù n-áá-íy-ìk-èèn-è* *n-úú-rúáru*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV PR-14-illness
bù-tim-īt-è *à-ùùth-à*
 SM.14-cause-PRF-FVSM.1-become thin-FV

‘This person is known that it is an illness that made him/her thin.’

In example (4), the preverbal NP *nūūrūaru* ‘illness’ is clefted and linked to the subject marker *bū-* of *būtimīte* ‘cause’, the causative verb, via class 14 agreement between the noun *ūrūaru* ‘illness’ and *bū-*. The matrix subject *muntū ūyū* ‘this person’ is linked to the subject of the verb *auutha* ‘became thin’, also via noun class agreement (class 1), in the clause embedded under *būtimīte*. Example (5) shows that the clefted preverbal NP is obligatory.

- (5) **mu-ntū ū-yū n-aa-iy-ìk-èèn-e* *bū-tim-īt-e*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV SM.14-cause-PRF-FV
a-uuth-a
 SM.1-become thin-FV

‘This person is known that it made him thin.’

The subject marker of *būtimīte* is class 14, which could refer to the class 14 noun *ūrūaru* ‘illness’, omitted here, as any preverbal subject NP may be in this language. However, the subject marker of a verb immediately embedded under an EOR verb may not receive such a pronominal interpretation, but must be coreferential with the matrix subject in the absence of a clefted preverbal NP.⁵ *Būtimīte* must be linked to an overt NP; hence, example (5), which has omitted this NP, is ungrammatical.

Not only is this preverbal NP obligatory, but it must also be clefted. An embedded subject which is not clefted, such as *ūrūaru* ‘illness’ in example (6), is ungrammatical.

⁵ In this respect these data may be compared to the Kiruundi data presented in Perez (Harford) [1984], in which the same coreference requirement on the embedded subject holds for finite verbs embedded under Control verbs. They may also be compared to English examples such as *John wants Mary to leave* and *John wants to leave*, in which the absence of *Mary* forces the subject of the infinitive *to want* to be coreferential with *John*.

- (6) **mu-ntũ ũ-yũ n-aa-iy-ĩk-een-e* *ũ-rũaru bũ-tim-ĩt-e*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV 14-illness SM.14-cause-PRF-FV

a-uuth-a

SM.1-become thin-FV

‘This person is known that an illness made him/her thin’

There are two other observations to be made about the EOR variant in which the matrix and embedded subjects are not linked to each other. First, the requirement for a clefted preverbal NP cannot be exclusively due to the change of subject between the matrix and embedded clauses, because it is possible to have an overt pronoun preceding the embedded verb which is linked to the matrix subject, as in (7a), as long as it is clefted. The example in (7b) is ungrammatical because the preverbal pronoun in the embedded clause is not clefted.

- (7) a. *mũ-ntũ ũ-yũ n-áá-iy-ĩk-èèn-è* *àĩ n-wé à-ij-ir-è* *m-bũrì*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that PR-PRO.1 SM.1-steal-PST-FV 10-goats

‘This person is known that it is s/he who stole the goats.’

- b. **mu-ntũ ũ-yũ n-aa-iy-ĩk-een-e* *aĩ we a-ij-ir-e* *m-bũrì*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that PRO.1 SM.1-steal -PST-FV 10-goats

‘This person is known that s/he stole the goats.’

The only way for a bare NP to appear in preverbal position in the embedded clause is for it to be linked to a clefted pronoun marked with the PR, as illustrated in (8). In this example, the independent pronoun *bũ* is the clefted preverbal NP and *ũrũaru* is a topic linked to it.

- (8) *mũ-ntũ ũ-yũ n-áá-iy-ĩk-èèn-è* *ũ-rũárú*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV 14-illness

ĩ-bũ bũ-tim-ĩt-è *à-ùùth-à*

PR-PRO.14 SM.14-cause-PRF-FV SM.1-become thin-FV

‘This person is known that an illness, it is it that made him/her sick.’

Second, it is also possible for the matrix subject to be coreferential with the object of the embedded clause rather than with a subject at a deeper level of embedding. As before, there must be a clefted preverbal NP. Examples (9a) and (9b) together show that non-clefting is ungrammatical. Examples (10a) and (10b) show that the object marker (OM) on the verb is optional and does not affect the requirement for a clefted preverbal NP.

- (9) a. ?*mù-ntù ù-yú n-áá-íy-ìk-èèn-è* *àtí í-cìngáù òdrag-ír-é*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that PR-Cingau SM.1-kill-PST-FV
 ‘This person is known that it is Cingau that killed.’
- b. **mu-ntū ū-yū n-aa-iy-īk-een-e* *aṭī cingau oorag-ir-e*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that Cingau SM.1-kill-PST-FV
 ‘This person is known that Cingau killed.’
- (10) a. *mù-ntù ù-yú n-áá-íy-ìk-èèn-è* *àtí í-cìngáù à-mū-úrág-ír-é*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that PR-Cingau SM.1-OM.1-kill-PST-FV
 ‘This person is known that it is Cingau that killed him/her.’
- b. **mu-ntū ū-yū n-aa-iy-īk-een-e* *aṭī cingau a-mū-ūrág-ir-e*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that Cingau SM.1-OM.1-kill -PST-FV
 ‘This person is known that Cingau killed him.’

Note the contrast with RS in a language like English, in which examples such as **This person seems that John killed (him)* and **This person seems John to have killed (him)* are impossible.⁶

To summarize at this point, in EOR, the matrix and embedded subjects are obligatorily coreferential, unless the matrix subject is linked to another embedded position and the embedded clause contains a clefted preverbal NP modified by a relative clause. The embedded subject is never interpreted as a pronoun.

1.1. Thematic Transmission. In the examples in the previous section, the matrix subject is not assigned a thematic role by the matrix verb, but receives one by being coreferential with an argument in the embedded clause. The evidence for thematic transmission in this construction comes from expletive subjects, idioms, and the obligatoriness of the embedded clause.

⁶ Examples in (9)-(10) do not cover all of the possibilities for the linking of the matrix subject in this construction, such as indirect object, possessor of an object, etc. There are two reasons why I prefer to confine the data to the possibilities presented here. First, the most important characteristic of this construction, on which the analysis to be presented below is based, is that the matrix subject need not be linked to the immediately embedded subject. The matrix subject must be linked to receive a thematic role, but the range of possible sources for this thematic role is tangential to the obligatory linking of the embedded subject. Second, the examples given already push the limits of the elicitation method, which requires reasonably natural and pragmatically plausible utterances to be fully reliable. Beyond a certain point, data become so artificial and pragmatically implausible that consultant judgements are unreliable. For these reasons, I will assume that there are no purely syntactic limitations on the linking of the matrix subject, since the analysis of this construction does not hinge on there being any.

1.1.1. Expletive Subjects. In example (1a), repeated here as (11), *muntū ūyū* appears as the subject of the embedded clause and the EOR verb has the Class 17 locative subject marker. The locative subject marker *kw-* is used here as an expletive, parallel to the use of English *there* in non-thematic positions. It may not be the subject marker of a verb with a thematic subject, as illustrated in (12).

- (11) *í-kw-iy-ìk-èèn -è* *àfì mù-ntū ū-yū n-áá-ìj-ir-è* *m-bùrì*
PR-SM.17-know-ST-REC/PRF-FV that 1-person this-1 PR-SM.1-steal-PST-FV 10-goats

‘It is known that this person stole goats.’

- (12) **i-kw-a-cam-ir-e* *ũ-cūrũ*
PR-SM.17-RPST-taste-past-FV 14-gruel

‘There tasted gruel.’

The possibility of an expletive subject indicates that the subject of this verb is athematic. The reader should consult Perez (Harford) [1983], Perez (Harford) [1985], and Bresnan and Kanerva [1988] for further discussion of the expletive use of locative morphology in Bantu languages.⁷

1.1.2. Idioms. Evidence that the matrix subject is thematically the subject of the embedded clause comes from idioms. The following sentence (13) means that an initiation candidate has completed the first stage of initiation. The idiomatic meaning is preserved when the subject of the idiom is the subject of *kūiyíkana*, as in (14).

- (13) *kī-rīmo i-kī-a-mer-ir-i-e*⁸ *mu-ntū ū-yū*
7-animal PR-SM.7-RPST-swallow-PST-VS-FV 1-person this-1

‘The “kirimo” swallowed this person.’

[= This person has completed the first stage of initiation.]

- (14) *kī-rīmo i-kī-iy-ìk-èèn-e* *afì i-kī-a-mer-ir-i-e*
7-animal PR-SM.7-know-ST-REC/PRF-FV that PR-SM.7-RPST-swallow-PST-VS-FV
mu-ntū ū-yū
1-person this-1

‘The “kirimo” is known to have swallowed this person.’

⁷ This pattern also occurs with the verbs *kùmènyèkànà* ‘to be known’ and *gũtìgwà* ‘to be thought’.

⁸ Certain morphemes, including the past morpheme *-ir-* and the habitual morpheme *-ag-* are infixed into verb stems ending in the vowel [i], as in this example and in examples (19a, b) that follow.

The observation that idiomatic meaning is preserved indicates that *kĩrĩmo* is the thematic subject of the embedded verb, not of the matrix verb *kũiyĩkana*.

1.1.3. Obligatory Presence of Embedded Clause. An apparent counterexample to the proposal that the thematic role of the matrix subject comes from the embedded clause is found in examples such as that in (15). The subject of this sentence must bear a thematic role, yet there is no embedded clause for this role to come from, indicating that the role comes from the matrix clause. This in turn suggests that the thematic role of the subject also comes from the matrix clause in the examples where there is an embedded clause. In that case, the matrix and embedded subjects would be bound without thematic role transmission.

- (15) *mu-ntũ ũ-yũ n-aa-iy-ĩk-een-e* *bweega mono*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV well very
 ‘This person is very well known.’

However, the verb in example (15) represents a distinct subcategorization for the same lexical item in whose predicate argument structure the subject bears a thematic role not derived by any thematic role assigning process. Unlike the verb which is followed by an embedded clause, this verb may not bear expletive concord, as shown by the ungrammatical example in (16).

- (16) **i-kw-iy-ĩk-een-e* *mu-ntũ ũ-yũ bweega mono*
 PR-SM.17-know-ST-REC/PRF-FV 1-person this-1 well very
 ‘There is known this person very well’

It is possible for a predicate whose subject thematic role has been suppressed by a process such as passivization to bear expletive concord, as in (17). Therefore, the example in (16) is not ungrammatical because of a failure of Case assignment following an intransitive verb. Rather, it is ungrammatical because the embedded clause is an obligatory constituent of the verb, which does not assign a thematic role to its subject. It is this verb that is the EOR verb.

- (17) *i-kw-aand-ag-w-a* *mp-eempe mũ-nda-ni ũ-ra*
 PR-SM.17-plant-HAB-PASS-FV 9-maize 3 -field-LOC 3-that
 ‘There is maize planted in that field.’

To summarize at this point, this section has developed arguments for thematic transmission in EOR on the basis of evidence from expletive subjects, idioms, and the obligatoriness of the embedded clause.

1.2. Clefting. This section presents evidence that a clefted NP is clefted by the addition of the assertion marker (PR), which removes it from the clause it is linked to.⁹ There are two kinds of evidence that the PR removes an NP from a clause. First, an NP marked with the PR appears at the left periphery of the clause, as in (18).

- (18) *i-ka-ĩjĩ ga-ka baaba a-gwat-ir-e ga-kĩ-iy-ag-a*
 PR-13-boy this-13 1.Father SM.1-catch-PST-FV SM.13-CONT-steal-HAB-FV
 ‘This boy, Father caught him stealing.’

Second, the clause following an NP marked with the PR is a relative clause.¹⁰ Evidence that this is the case comes from an alternation in the class 1 subject marker: it takes the form *a-* in main clauses and object relative clauses, but may appear as *ũ-* in subject relative clauses (*w-* before vowels), as illustrated by the examples in (19).¹¹ This alternation is not possible in non-relatives (20).

- (19) a. *ĩ-mb-ón-ir-è mù-ntũ ũ-rá w-èènd-ág-ì-à mà-ũà.*
 PR-I-see-PST-FV 1-person 1-that REL.SM.1-sell-HAB-VS-FV 6-flowers
 ‘I saw the person who sells flowers.’
- b. *n-w-ĩjĩ mù-ntũ ũ-rá èènd-ág-ì-à mà-ũà?*
 PR-you-know 1-person 1-that SM.1/sell-HAB-VS-FV 6-flowers
 ‘Do you know the person who sells flowers?’

- (20) a. *màitũ òòn-ir-e bààbà* ‘Mother saw Father.’
 1.Mother SM.1/see-PST-FV 1.Father
- b. **maitũ w-on-ir-e baaba*
 1.Mother REL.SM.1-see-PST-FV 1.Father

⁹ This being one of several functions of the PR. Note that this assumption applies only to NPs marked with the PR, not to verbs.

¹⁰ Other Bantu languages in which clefts are followed by relative clauses include Chichewa [Bresnan & Mchombo 1987], Kihung’an [Takizala 1972], Gikuyu [Clements 1985] and Kiruundi [Sabimana 1986].

¹¹ This alternation is optional for my consultants, all of whom are younger speakers. I suspect that it is obligatory for older speakers. It is presented as obligatory in descriptions of Gikuyu. Note also that two other potential types of evidence for relative clausehood in the Thaagicu subgroup and in Bantu languages in general are not available for Kitharaka. There is no tonal evidence that I know of; that is, no evidence of an initial high tone, although not enough work has been done on the tonal system of this language to be sure. Also, the distinction between the *-ti-* and *-ta-* negative markers, which may be used to distinguish relative from non-relative clauses in Gikuyu [Barlow 1951, Bergvall 1987, Clements 1984], may not be used in Kitharaka, since *-ti-* and *-ta-* are attested in both relatives and non-relatives.

The alternate form is possible in clauses following NPs marked with the PR, providing evidence of their relative status, as in (21). The example in (22) provides a sample of its occurrence in EOR.

- (21) *i-mu-ntũ ũ-yũ ũ-raa-ij-ir-e m-bũri*
 PR-1-person this-1 REL.SM.1-NPST-steal-PST-FV 10-goats
 ‘It is this person who stole goats.’

- (22) *mũ-ntũ ú-yũ n-áá-iy-ìk-èèn-è àtĩ n-wé*
 1-person this-1 PR.SM.1-know-ST-REC/PRF-FV that PR-PRO.1
ũ-ráá-ij-ir-è m-bũrì
 REL.SM.1-NPST-steal-PST-FV 10-goats
 ‘This person is known that it is s/he that stole goats.’

A second property of relative verbs, unrelated to noun class, is that a relative verb may not bear the PR (23), nor may a verb in a clause following an NP which is marked with the PR (24). Significantly, the EOR case (25), as well, does not permit PR.

- (23) **i-mb-on-ir-e mu-ntũ ũ-ra n-w-eend-ag-i-a ma-ũa*
 PR-I-see-PST-FV 1-person 1-that PR-REL.SM.1-sell-HAB-VS-FV 6-flowers
 ‘I saw the person who sells flowers.’

- (24) **i-ka-ĩjĩ ga-ka baaba n-aa-gwat-ir-e ga-kĩ-iy-ag-a*
 PR-13-boy this-13 1.Father PR.SM.1-catch-PST-FV SM.13-CONT-steal-HAB-FV
 ‘This boy, Father caught him stealing.’

- (25) **mu-ntũ ũ-yũ n-aa-iy-ìk-èèn-e n-ũũ-rũaru*
 1-person this-1 PR.SM.1-know-ST-REC/PRF-FV PR-14-illness
i-bũ-tim-ĩit-e a-uuth-a
 PR-SM.14-cause-PRF-FV SM.1-become thin-FV
 ‘This person is known that it is his/her illness which made him/her thin.’

To summarize, an NP is clefted by the PR, which removes it from its clause. Two kinds of evidence for this removal are: 1) the clefted NP appears at the left periphery of the clause; 2) the clefted NP is followed by a relative clause. Evidence that this clause is a relative comes from the observations that it may take the class 1 relative subject marker *ũ-* and that it may not bear the predicator marker. Both of these types of evidence indicate that the clefted preverbal NP in the embedded clause of a EOR verb has been removed from its clause.

2. Analysis of EOR

In this section, I propose an analysis of EOR using the Principles and Parameters (P & P) framework [Chomsky 1981, Haegeman 1994]. The properties of the EOR construction illustrated in the previous section may be summarized as in (26).

- (26) Properties of the EOR construction
- a. Its matrix subject position is athematic. (§ 1.1)
 - b. Its embedded complement may be finite or non-finite. (examples (1a-b))
 - c. A “raised” matrix subject corefers with the subject or a non-subject of an embedded finite clause. (examples (1b), (9a), (10a))
 - d. If there is a subject NP in the embedded clause, it must be clefted. (examples (4), (5))
 - e. If there is no subject NP in the embedded clause, the matrix subject corefers with the empty embedded subject. (examples (4), (6))

I assume that properties (26a-b) are stipulated as part of the lexical entries of EOR verbs. Property (26c) raises the question of how coreference is established between the matrix subject and a position in the embedded clause. Pursuing a familiar strategy, one could propose that the matrix subject is moved to the matrix clause from the embedded clause, establishing coreference through the linkage between the two positions. This proposal encounters two problems.

First, interclausal movement is ruled out in this context by several principles of P & P theory. The theory recognizes two types of movement: WH-movement and NP-movement. WH-movement between the two clauses of an EOR construction is ruled out by the reasonable assumption that the matrix subject occupies an A-position (an argument position), not an A'-position (a non-argument position). WH-movement takes place only to an A'-position. NP-movement is also ruled out, by two separate requirements which interact to restrict NP-movement to the subjects of non-finite clauses. Movement between finite clauses violates Principle A of the Binding Theory. In addition, the subject and object positions of finite clauses are both Case-marked positions, and traces of NP-movement are required to be Caseless.

Second, the proposal sheds no light on properties (26d-e), the properties of EOR which crucially distinguish it from constituent question formation, which may be straightforwardly analyzed as involving WH-movement (see §2.2). There is no way I know of for either type of movement to force the clefting of an intervening subject NP.

However, the theory provides another way of accounting for coreference which does not involve interclausal movement and which also offers a way to account for properties (26d-e). Consider the Tough Movement construction in English (27).

(27) *Mary is tough to cheat.*

The meaning of this sentence entails that *Mary* is the object of the verb *cheat*, but it does not occupy the canonical object position, the position immediately following *cheat*, to which it assigns a theta role and Case. Instead, in accordance with the Projection Principle [Chomsky 1981], this position is occupied by an empty category, which must be linked to *Mary* to establish coreference. However, for reasons just discussed, this linkage cannot be established directly through interclausal movement. Instead, a non-overt element, referred to as an empty operator, is base-generated in the object position in the embedded clause and moved to the immediately embedded SPEC/CP, following standard assumptions about empty operator movement (Chomsky [1977], Contreras [1993], Lasnik and Stowell [1991]); for a contrary view about the landing site of the empty operator, see Authier [1989]. The matrix subject is base-generated in its surface position and coindexed with the empty operator in SPEC/CP, establishing coreference. In this way, the idea of accounting for coreference by movement is retained, but in a way that avoids violating theoretical principles that are otherwise well-established.¹²

These ideas may be extended to EOR in Kitharaka. Recall example (1b), repeated here as (28). In this example, I propose that an empty operator (\emptyset_i) has been base-generated in the embedded subject position, satisfying the Extended Projection Principle [Chomsky 1981], which requires all sentences to have subjects. It has then been moved to the embedded SPEC/CP, leaving behind a coindexed trace (t_i). The empty operator is coindexed with the matrix subject, which is linked in this way to the embedded subject and accordingly inherits its theta role. The example in (28) may then be represented as in (29).

(28) *mù-ntũ ú-yũ n-áá-iy-ìk-èèn-è àñ n-áá-ij-ìr-è m-bũrì*
 1-person this-1 PR-SM.1-know-ST-REC/PRF-FV that PR-SM.1-steal-PST-FV 10-goats
 ‘This person is known to have stolen goats’

(29) Muntũ ũyũ naiyĩkeene ati [\emptyset_i [t_i na_iijire mbũri]]
 ‘This person is known to have stolen goats.’

¹² Other constructions for which empty operators have been proposed include *that*-relatives and parasitic gaps in English. See Haegeman [1994] for a discussion of empty operators in *that*-relatives.

As the representation indicates, the matrix subject is linked to the embedded subject via the empty operator without interclausal movement. The case in which the matrix subject is linked to an embedded non-subject receives the same analysis (30).

- (30) Muntū ūyū_i; naiyīkeene aŋi [\emptyset _i [nūūrūaru_j [t_i [e_j bŷ_jtimūite [t_i a_iuutha]]]]
-

‘This person is known that it is an illness that made him/her thin.’

The empty operator also provides an account of properties (26d-e), the constraints on the immediately embedded subject. The property which is the key to the analysis is (26d), the obligatory clefting of an embedded subject NP which is not coreferential with the matrix subject. Why is clefting of such a subject obligatory? Recall from section 1.2 that the effect of clefting is to remove an NP from its clause. Why is removal of this NP obligatory in this context? One possibility, suggested by the work of Ouhalla [1993] is that it must be removed to maintain a certain distance from something else. What is this something else? The most obvious answer is that it is the empty operator in SPEC/CP. Setting aside examples (7a-b) for the time being, the following descriptive generalization emerges from the rest of the data.

- (31) If there is no agreement between the matrix and embedded subjects, the empty operator must not occur in the same CP as the immediately embedded subject.

This requirement on the empty operator—that it maintain a certain distance from the immediately embedded subject—is reminiscent of Ouhalla’s [1993] Anti-Agreement Effect (AAE). The AAE describes a phenomenon in which local extraction of a subject forces neutral agreement on the verb of the clause it was extracted from.¹³ Ouhalla’s idea (see also Borer [1984]) is that a WH-operator in SPEC/CP may bind the immediately following subject position, creating unacceptability under certain conditions. Without adopting Ouhalla’s explanation of the AAE (rich subject AGR licenses a resumptive pronoun in subject position, which then cannot be bound by the WH-operator), the basic proposal here for EOR is that the clefting of an embedded subject NP distinct in reference from the matrix subject is a strategy to create enough distance between the empty operator and the following subject position to prevent the former from binding the latter. This strategy is required precisely when there is a change in subject because the empty

¹³ The AAE exists in Kitharaka, as illustrated in example (19a) above.

operator and the embedded subject bear different indices and therefore cannot form a chain.

For example, compare (1b) and (5), represented schematically in (32) and (33), respectively. In (32), the SM of the embedded verb agrees in noun class with its subject, the trace of the empty operator, which, in turn, is coindexed with the matrix subject. Therefore, the three may form a chain, and the empty operator acceptably binds the embedded subject position. In (33), on the other hand, the SM of the embedded verb belongs to a noun class different from that of the matrix subject. Therefore, the empty operator cannot bind the embedded subject without creating a chain with different indices, and the example is ungrammatical.

(32) Muntū ūyū_i naiyīkeene afi [\emptyset_i [t_i na_iijire mbūri]]

‘This person is known to have stolen goats.’

(33) *Muntū ūyū_i naiyīkeene afi [\emptyset_i [e_j bū_jtimĩite [t_i a_iuutha]]

‘This person is known that it made him/her thin.’

Now compare (4) and (6), represented here as (34) and (35), respectively. The example in (35) is ungrammatical for the same reason as that in (33): it binds the embedded subject *ūrūaru*, which has a distinct index, as well as being an R-expression, which cannot be bound in any case, according to Condition C of the Binding Theory. In (34), the clefting of *ūrūaru* places the nearest embedded subject position in a relative clause modifying the focus of the cleft. Assuming that the empty operator is still in the highest SPEC/CP, it is no longer close enough to the nearest subject position to bind it.

(34) Muntū ūyū_i naiyīkeene afi [\emptyset_i [nūrūaru_j [t_i [e_j bū_jtimĩite [t_i a_iuutha]]

‘This person is known that it is an illness that made him/her thin.’

(35) *Muntū ūyū_i naiyīkeene afi [\emptyset_i [ūrūaru_j bū_jtimĩite [t_i a_iuutha]]

‘This person is known that an illness made him/her thin.’

Now consider (7a) and (7b), represented here in (36) and (37), respectively. The same pattern holds that was observed earlier: the overt pronoun *we* ‘s/he’ cannot occur in the embedded clause without being clefted. However, since the pronoun is

coreferential with the matrix subject, (37) cannot be ungrammatical because of the need to avoid an illicit chain.

(36) Muntū ūyū_i naiyīkeene afi [\emptyset _i [nwe_i [t_i a_iijire mbūri]]]

‘This person is known to have stolen goats.’

(37) *Muntū ūyū_i naiyīkeene afi [\emptyset _i [we_i a_iijire mbūri]]

‘This person is known that s/he who stole goats.’

I propose that the ungrammaticality of (37) is similar to that of (35), which involves a Condition C violation as well as an illicit chain. In this instance, the problem with (37) is that the empty operator binds the independent pronoun *we*, a violation of Ouhalla’s formulation of Aoun and Li’s A'-disjointedness Requirement, stated in (38) (See also Aoun and Hornstein [1986], Aoun and Li [1993].

(38) A pronoun must be free from the most local A'-binder in the smallest C(omplete) F(unctional) C(omplex) which contains the pronoun. [Ouhalla 1993:506]

The smallest CFC is the minimal CP which contains the pronoun (*ibid.*, p.490).

To summarize, the obligatory clefting of an NP distinct from the matrix subject in an EOR construction has been argued to be a strategy to distance the embedded subject position from the EO in the immediately embedded SPEC/CP, to avoid forming an illicit chain. This strategy is also required when an independent pronoun occurs in the embedded clause, to avoid violating the A'-disjointedness Requirement.

2.2. EOR and WH-Movement This section compares EOR with WH-movement in Kitharaka. The analysis in the preceding section is based on the idea that an empty operator in SPEC/CP binds the following subject position. However, not all exhibit the same behavior. For example, relative clauses, which can reasonably be assumed to be WH-constructions in Kitharaka, fail to show the patterns of coreference and clefting illustrated above for EOR. The following are examples of constituent questions, in which the interrogative is clefted and placed at the left periphery. As seen above in section 1.2, clefted NPs are followed by relative clauses.

As the examples in (39) show, the question word *nūū* may be linked to either the subject (39a) or the object (39b-c) of the embedded clause. Note, however, the status of the subject in the examples in which the object has been extracted. There is no preverbal NP in the embedded clause in (39b), but there is no obligatory link

between the embedded subject and the extracted wh-word. Contrast this example with the examples in (33), (34), and (35) above, which show that in EOR, the embedded subject must be bound by the matrix subject unless it is a clefted preverbal NP. Note also that in example (39c), there is a preverbal NP in the embedded clause, but it is not clefted.

(39) a. *n-ũũ maitũ a-ug-ir-e afĩ n-oon-ir-e baaba*
 PR-who 1.Mother SM.1-say-PST-FV that PR-SM.1-see-PST-FV 1.Father
mũ-cemanio-ni?
 3-meeting-LOC

‘Who did Mother say saw Father at the meeting?’

b. *n-ũũ maitũ a-ug-ir-e afĩ n-oon-ir-e mũ-cemanio-ni?*
 PR-who 1.Mother SM.1-say-PST-FV that PR-SM.1-see-PST-FV 3-meeting-LOC

‘Who did Mother say s/he saw at the meeting?’

c. *n-ũũ maitũ a-ug-ir-e afĩ baaba n-oon-ir-e mũ-cemanio-ni?*
 PR-who 1.Mother SM.1-say-PST-FV that 1.Father PR-SM.1-see-PST-FV 3-meeting-LOC

‘Who did Mother say Father saw at the meeting?’

Similar differences in the binding properties of WH-operators have been observed in other languages, particularly by Ouhalla [1993], who points out that in languages such as Fiorentino and Trentino, intermediate traces trigger the AAE, whereas in languages like Berber and Breton, they don’t (p.491). Also, differences in the type of WH-operator (QP vs. empty operator) have been correlated with crossover effects in English by Lasnik and Stowell [1991]. An explanation of the split in binding effects found in EOR and constituent questions in Kitharaka may be pursued along either of these lines, but I will leave the issue open.

3. Conclusion

This paper has described a biclausal construction in Kitharaka, referred to as Empty Operator Movement (EOR), which combines an athematic matrix subject with a finite complement. “Raising” to the matrix subject position may take place from a subject or a non-subject position in this finite clause. The assumption that empty operator movement is possible in finite clauses in this language has been used to account for a syntactic property not found in any English construction, namely the requirement that if the subject of the immediately embedded clause is distinct from the matrix subject, there must be a clefted NP in the embedded clause. This requirement has been attributed to the need to avoid the binding of the embedded subject by the empty operator in the immediately embedded SPEC/CP.

REFERENCES

- Aoun, Joseph and Norbert Hornstein. 1986. "Bound and Referential Pronouns" To appear in James Huang and Robert May (eds.), *Logical Structure and Linguistic Structure*. Dordrecht: Kluwer.
- Aoun, Joseph and Audrey Li. 1993. *Syntax of Scope*. Cambridge, MA: MIT Press.
- Authier, J.-Marc. 1989. "Two Types of Empty Operator." *Linguistic Inquiry* 20: 117-25.
- Barlow, A. Ruffell. 1951. *Studies in Kikuyu Grammar and Idiom*. Edinburgh: William Blackwood and Sons.
- Bennett, Patrick R. 1970. "The Problem of Class in Kikuyu." *African Language Studies* 8:48-59.
- Bergvall, Victoria L. 1987. "Focus in Kikuyu and Universal Grammar." Ph.D. dissertation, Harvard University.
- Bleek, W.H.I. 1862. *A Comparative Grammar of South African Languages*. Cape Town: J.C. Juta.
- Bokamba, Eyamba. 1981. *Aspects of Bantu Syntax*. Preliminary edition, Department of Linguistics, University of Illinois, Champaign-Urbana.
- Borer, Hagit. 1984. "Restrictive Relatives in Modern Hebrew." *Natural Language and Linguistic Theory* 2:219-60.
- Bresnan, Joan and Jonni Kanerva. 1988. "Locative Inversion in Chicheŵa: A Case Study of Factorization in Grammar." *Linguistic Inquiry* 20:1-50.
- Bresnan, Joan and Sam Mchombo. 1987. "Topic, Pronoun and Agreement in Chicheŵa." *Language* 63:741-782.
- Bresnan, Joan and Lioba Moshi. 1990. "Object Asymmetries in Comparative Bantu Syntax." *Linguistic Inquiry* 21:147-185.
- Chomsky, Noam. 1977. "On *wh*-movement." In P. Culicover, T. Wasow, and A. Akmajian (eds.), *Formal Syntax*, pp. 71-133. New York: Academic Press.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.

- Clements, George N. 1984. "Principles of Tone Assignment in Kikuyu." In George Clements and John Goldsmith (eds.), *Autosegmental Studies in Bantu Tone*, pp. 281-339. Dordrecht: Foris.
- Clements, George N. 1985. "Binding Domains in Kikuyu." *Studies in the Linguistic Sciences* 14:37-56.
- Contreras, Helas. 1993. "On Null Operator Structures." *Natural Language and Linguistic Theory* 11:1-30.
- Demuth, Katherine and Jeffrey Gruber. 1995. "Constraining XP Sequences." In Victor Manfredi and Karl Reynolds (eds.), *Niger-Congo Syntax and Semantics* No. 6:3-30. Boston, MA: Boston University African Studies Center.
- Demuth, Katherine and Mark Johnson. 1989. "Interaction between Discourse Functions and Agreement in Setawana," *Journal of African Languages and Linguistics* 11:21-35.
- Haegeman, Liliane. 1994. *Introduction to Government and Binding Theory* (2nd edition). Oxford: Basil Blackwell.
- Lasnik, Howard and Tim Stowell. 1991. "Weakest Crossover." *Linguistic Inquiry* 22:687-720.
- Lindblom, G. 1914. *Outline of a Tharaka Grammar*. Uppsala: J.A. Lundell.
- Mbeeria, Kithaka wa. 1979. "The Morphology of Kitharaka Nominal Word." B.A. thesis, University of Nairobi.
- Mbeeria, Kithaka wa. 1981. "The Consonants of Kitharaka." M.A. thesis, University of Nairobi.
- Mchombo, Sam. 1990. "A Formal Analysis of the Stative Construction in Bantu." Paper presented at the 21st Annual Conference on African Linguistics, University of Georgia, Athens.
- Ouhalla, Jamal. 1993. "Subject-Extraction, Negation and the Anti-Agreement Effect." *Natural Language and Linguistic Theory* , 11:477-518.
- Perez (Harford), Carolyn. 1983. "Locative Pseudo-Subjects in Shona." *Journal of African Languages and Linguistics* 5:131-155.

Perez (Harford), Carolyn. 1984. "Anaphoric Binding in Bantu." In J. Drogo, V. Mishra and D. Testen (eds.), *Papers from the Twentieth Regional Meeting of the Chicago Linguistic Society* 20: 301-308.

Perez (Harford), Carolyn. 1985. "Aspects of Complementation in Three Bantu Languages." Ph.D dissertation, University of Wisconsin-Madison. [Distributed by the Indiana University Linguistics Club, Bloomington, IN, 1986.]

Sabimana, Firmard. 1986. "The Relational Structure of the Kirundi Verb." Ph.D dissertation, Indiana University.

Takizala, Alexis. 1972. "Focus and Relativization: The Case of Kihung'an" In John P. Kimball (ed.), *Syntax and Semantics*, Vol. 2, pp. 123-148. New York: Academic Press.

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TWO KINDS OF MORAIC NASAL IN CIYAO*

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A problematic issue in a number of Bantu languages concerns the phonological analysis of “preconsonantal nasality”, i.e., the question of whether NC entities should be analyzed as single prenasalized consonants or as sequences of nasal + (homorganic) consonant. In this paper, the authors examine two kinds of moraic nasal—one syllabic, one not—in Ciyao, a Bantu language spoken in East Africa. They further demonstrate that there is a third type of preconsonantal nasality in Ciyao which is neither moraic nor syllabic.

0. Introduction

Among the few problematic issues surrounding the syllabification of consonants in Bantu languages is the proper interpretation of “preconsonantal nasality”: For each relevant language of the family, one must first ask whether the sequencing of [+nasal] [-nasal] in forms such as Proto-Bantu *ba-ntu ‘people’ is properly viewed as a consonant cluster or as a single prenasalized consonant. Noting that

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preconsonantality frequently lengthens a preceding vowel and may also count as a tone-bearing unit, a number of recent publications have provided analyses that either start with or assign a mora to NC sequences [Bickmore 1989, 1991; Downing 1991; Hubbard 1995, 1996; Hyman 1992; Maddieson 1993; Odden 1991]. Not addressed in most of these accounts is the fact that quite a number of Bantu languages have more than one type of preconsonantal nasality (but see Odden [1996]). One such language is Ciyao, classified as P.21 by Guthrie [1967-1971] and spoken in Mozambique, Tanzania, and Malawi. The variant of Ciyao described in this study is that spoken in Chicónóno (Mozambique), of which the second author is a native speaker.

As indicated in (1), in this language there are three kinds of preconsonantal nasality. These three types of nasality result in two distinct two-way oppositions. Morpheme-internally—specifically, in lexical roots—NC contrasts with ^NC. That is, there exists a contrast in moraicity only, both nasal types being non-syllabic. A syllabic contrast in nasals is found across morpheme boundaries with certain N-final prefixes plus C-initial roots, i.e., a contrast between syllabic N'C and non-syllabic NC.

(1) Three types of preconsonantal nasality in Ciyao:

- a. Moraic but not syllabic (symbolized as NC)
- b. Moraic and syllabic (symbolized as N'C)
- c. Non-moraic and non-syllabic (symbolized as ^NC)

As documented in Kadima [1969] and Bell [1972], Ciyao is not alone in having two kinds of moraic nasals (see also Givón [1974] and Herbert [1986]). The presence of a three-way distinction, including non-moraic preconsonantal nasality, is less frequent, in fact unreported, as far as we know. The purpose of the present study is to provide an account of the moraic representation and derivation of all three types of preconsonantal nasality in Ciyao. As we shall see, the presence of the syllabic nasal (N') crucially interacts with representations that have been proposed for the moraic nasal (N). The paper is organized as follows: We begin in §1 with a presentation of the properties of the moraic nasal, primarily its lengthening effect on the preceding vowel and its interactions with the following consonant. In §2 we describe the corresponding properties of the syllabic nasal, showing that it has neither of the effects of the moraic nasal. We then present our analysis of both types of moraic nasals in §3. In this last section we draw evidence from the non-moraic (and non-syllabic) nasal (N) to show that the distribution of the syllabic nasal is allomorphically conditioned.

1. The Moraic Nasal

As mentioned, Ciyao has three types of prenasal nasal. The first which we shall consider is reconstructed for Proto-Bantu and corresponds to the nasal discussed in recent moraic accounts [Bickmore 1989; Downing 1991; Hubbard 1995, 1996; Hyman 1992; Maddieson 1993]. In Ciyao, this nasal, which we refer to as the “moraic nasal”, has an effect both on the preceding vowel as well as on the following consonant. First, as seen in (2), the sequence moraic nasal + consonant conditions a lengthening of the preceding vowel (cf. Hubbard [1994] and Ngunga [1995] for phonetic details). The examples in (2) illustrate the moraic nasal as it occurs intramorphemically (i.e., here within a verb root).¹ We provide one example of each of the four NC sequences that exist in the language (the C being necessarily voiced). As is customary in Bantu studies, length is indicated by doubling the vowel in question.²

(2) Vowel lengthening before moraic N+C

- | | | | | | |
|---------|---|-----------|---|-------------|---------------------|
| a. [mb] | : | ku-gúmb-á | → | ku.gúú.mb-á | ‘to mould’ |
| b. [nd] | : | ku-ténd-á | → | ku.téé.nd-á | ‘to do’ |
| c. [nj] | : | ku-sánj-á | → | ku.sáá.nj-á | ‘to sharpen (tool)’ |
| d. [ŋg] | : | ku-cíng-á | → | ku.cíí.ng-á | ‘to herd’ |

This lengthening process, which is informally captured by the linear rule in (3), has been the subject of several non-linear studies. The first of these, Clements’ [1986] analysis of Luganda, provides an account utilizing the CV framework of Clements and Keyser [1983]. Subsequent studies have substituted X’s for the C’s and V’s of the skeletal tier—or have used moras.

(3) V → V: / ___ NC

¹ In (2), *ku-* is the class 15 prefix used to form infinitives, while the *-á* is the inflectional final vowel (FV) morpheme which is required on most verb forms. In subsequent examples, the FV will not be separated from the rest of the verb stem. Throughout the study, transcriptions follow standard IPA except that “c” and “j” stand for alveopalatal affricates.

² One reviewer suggests that the vowel length in (2) may be analyzed as underlying, particularly as the language does have a limited number of forms where a short vowel precedes the NC (see §3.3). The major point we wish to make is that morpheme-internal prenasal nasal is affiliated with preceding vowel length in the general case. Thus, among the 2,591 cases of a morpheme-internal VNC sequence in the second author’s lexical database of Ciyao, only 213 (8.2%) involve a short vowel. By contrast, of the 9,681 cases of morpheme-internal VC sequences (where C ≠ NC), 7,278 (75.2%) are short vowels. Given these statistics, even if we were to set up an underlying intramorphemic contrast between /VNC/ and /VVNC/, we would have to account for the differential distribution of these sequences versus /VC/ and /VVC/. By identifying the mora that provides length on the preceding vowel with the nasal, we are able to relate the majority of VVNC cases to the moraic nasal prefixes discussed in this section.

Translating Clements' analysis into a moraic framework, a straightforward account would be as summarized in (4). In the input in (4a), the moraic nasal is prelinked to a mora, which is substituted for the V slot that Clements [1986] had proposed. The output in (4b) shows two differences from the input in (4a): First, the nasal has left its mora to join the following one (thereby creating a prenasalized consonant). Second, by a process of compensatory lengthening (CL), the vowel has taken over the mora of the nasal and become long.

(4) Pre- and post-compensatory lengthening (CL) representations of *-ténd-á* 'do'



Assuming, as implied, a derivational approach, there are two logical interpretations of the two-part change in (4). These are formalized in (5). Borrowing a concept from historical linguistics, in (5a) we have what can be called a “drag chain” effect. In this interpretation, the process is triggered by the change of status of the nasal. As shown, by a process of spreading + delinking, the nasal shifts from its mora onto the following mora. Subsequently, the preceding vowel spreads (“is dragged”) onto the freed up mora. In the interpretation represented in (5b), we have a “push chain” effect, which is again triggered by a spreading + delinking process: The vowel first spreads to the right onto the following mora, from which the nasal delinks. This is followed by “pushing” the nasal to relink to the following mora.

(5) “Drag” vs. “push” interpretations of the CL trigger



Having considered this phenomenon across several Bantu languages, we have determined that the choice between the two interpretations in (5) is a subtle one, at best.³ As we shall see in §4, the problem disappears when we propose that the nasal is not actually prelinked to its mora.

³ The reader may wish to reconsider in this context the interpretation of other cases of CL in Luganda also treated by Clements [1986]. Consider, for example, the change of /kua/ to [k^waa], which occurs in Luganda, Ciyao, and many other Bantu languages. As pointed out to us by Nick Clements (personal communication), and as seen in (a) and (b) on the next page, there are two possible interpretations of this change within Clements' CV framework. In (a), Clements' analysis, the /u/ first shifts from its V to the preceding C, thereby creating a labialized consonant [k^w]. The

Besides its lengthening effect on the preceding vowel, the moraic nasal conditions major interactions with the following consonant. As mentioned in connection with the examples in (2), the only surface manifestations of NC derived from the moraic nasal are [mb, nd, nj, ŋg], i.e., the post-nasal consonant must be voiced. In order to see why this is the case, we must enlarge our scope to consider the full distribution of the moraic nasal.

(6) Distribution of the moraic nasal

- a. Morpheme-internally, i.e., in roots : see (2)
- b. 1st person singular object prefix -N- : see (7)
- c. 1st person singular subject prefix -N- : see (8)
- d. Class 9/10 noun prefix N- : see (9)

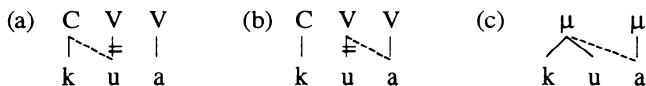
As indicated in (6), the moraic nasal occurs in four contexts in Ciyao. We have already seen examples of morpheme-internal NC in (2). Now consider the examples in (7) involving the 1st person singular object prefix -N-, which occurs between the infinitive prefix *ku-* and the verb root. As seen in all the examples, the vowel of *ku-* lengthens as expected and, except for (7d), the nasal is realized homorganic to the following consonant.

(7) Lengthening of *ku-* before -N- ‘1st person singular object prefix’
(= homorganic to following C)

- a. When the following consonant is voiceless, it becomes [+voice]

<i>ku-N-péleka</i>	→	<i>kuu-m-béleka</i>	‘to send me’
<i>ku-N-túma</i>	→	<i>kuu-n-dúma</i>	‘to order me’
<i>ku-N-cápila</i>	→	<i>kuu-ŋ-jápila</i>	‘to wash for me’
<i>ku-N-kwéela</i>	→	<i>kuu-ŋ-gwéela</i>	‘to climb on me’

following /a/ spreads (“is dragged”) onto the preceding available V. In (b) the process begins when the vowel /a/ spreads onto the preceding V slot of /u/, which then delinks (and is “pushed” onto the preceding C slot).



Again the choice between the two interpretations is a subtle one. Note, however, that within the moraic framework of Hyman [1985] in (c) there is only one interpretation: the vowel /a/ spreads onto the preceding /ku/ mora, thereby creating the required length. Within this framework, the desyllabification of /u/ to [w] is a direct consequence of /u/ being less sonorous than /a/.

b. When the following consonant is voiced, it deletes

ku-N-búúčila	→	<i>kuu-múúčila</i>	‘to be angry with me’
ku-N-vácíla	→	<i>kuu-mácíla</i>	‘to build for me’
ku-N-lápa	→	<i>kuu-nápa</i>	‘to admire me’
ku-N-jiima	→	<i>kuu-níima</i>	‘to begrudge me’
ku-N-góneka	→	<i>kuu-ńóneka</i>	‘to make me sleep’
ku-N-mála	→	<i>kuu-mála</i>	‘to finish me’
ku-N-néma	→	<i>kuu-néma</i>	‘for me to do incorrectly’
ku-N-ńála	→	<i>kuu-ńála</i>	‘to cut me into small pieces’
ku-N-ńáándila	→	<i>kuu-ńáándila</i>	‘to play around with me’

c. An exception to (7b) is /d/, which does not delete

ku-N-dípa	→	<i>kuu-n-dípa</i>	‘to pay me’
ku-N-délela	→	<i>kuu-n-délela</i>	‘to underestimate me’

d. The moraic nasal deletes when followed by /s/

ku-N-sóosa	→	<i>kuu-sóosa</i>	‘to look for me’
------------	---	------------------	------------------

Considering each set of forms separately, in (7a) the moraic nasal voices a following voiceless /p, t, c, k/. In (7b), on the other hand, an input voiced consonant deletes after the moraic nasal.⁴ Each of these two generalizations has one exception. First, in (7c) we see that [d] does not delete after the moraic nasal.⁵ Second, in (7d) we see that /s/, the only voiceless fricative in the language, does not voice to become [z]. Instead, the common process of nasal effacement takes place and the moraic nasal is lost (leaving behind its CL effect on the preceding vowel).

In (8) we see exactly the same changes as noted in (7), but this time involving the 1st person singular subject prefix N-. In all examples, the final vowel of the preposed temporal adverb *leeló* ‘today’ is lengthened, showing that the CL process conditioned by the moraic nasal also applies across words. In addition, in (8a) underlying voiceless /p, t, c, k/ are all voiced after the moraic nasal, whereas in (8b) underlying oral voiced consonants are all deleted. Examples in (8c) show

⁴ Kenstowicz and Kisseberth [1977:157] cite identical facts to those in (7a) and (7b) in the very closely related language (ci-)Mwera studied by Harries [1950] as an example of counter-feeding rule ordering: The voiced consonants must delete prior to the voicing of voiceless consonants. Otherwise one will obtain a derivation of mp → mb → m, which is incorrect. Of course, a simultaneous rule application (or “direct mapping” as Kenstowicz and Kisseberth refer to it) would also work.

⁵ While there is an underlying /d/, which occurs in a restricted number of roots, most occurrences of non-prenasalized [d] result from a rule that converts /l/ to [d] before /i/: *ku-mílá* [mílá] ‘to swallow’ vs. *ku-míl-il-a* [mídíla] ‘to swallow for’. Whether deriving from /l/ or /d/, [d] never deletes after the moraic nasal.

the non-deletion of [d], while (8d) shows the deletion of the moraic nasal before /s/.

- (8) Lengthening of final vowel of preceding word before N-
‘1st person singular subject prefix’
- a. *leelóó m-beléece* ‘today I sent’
leelóó n-dumíle ‘today I ordered’
leelóó n-japiile ‘today I washed for (s.o.)’
leelóó n-gweesíle ‘today I climbed’
- b. *leelóó muucíle* ‘today I was angry’
leelóó macíile ‘today I built for’
leelóó napíle ‘today I admired’
leelóó niimíle ‘today I begrudged’
leelóó nonéece ‘today I made (s.o.) sleep’
leelóó masíle ‘today I finished’
leelóó nemíle ‘today I did (sth.) incorrectly’
leelóó nasíle ‘today I cut into small pieces’
leelóó naandíile ‘today I played around with (sth.)’
- c. *leelóó n-dipíle* ‘today I paid’
leelóó n-deléele ‘today I underestimated’
- d. *leelóó soosíle* ‘today I looked for’

Finally, the fourth context where a moraic nasal is found concerns the noun class prefix N- used both in singular class 9 and in its corresponding plural class 10. This prefix is illustrated in (9). Again, all examples show vowel lengthening before the moraic nasal, in this case, lengthening of the FV of the verb *ku-lék-á* ‘to leave’. The examples in (9a) involve nouns which have a voiced consonant following the nasal prefix. The examples in (9b) begin with a nasal consonant, while the example in (9c) begins with an /s/ which has conditioned the deletion of the preceding moraic nasal prefix.⁶

⁶ We have found a number of class 9/10 nouns lacking a surface (or underlying) nasal prefix. In these cases the preceding vowel is not lengthened, e.g., *ku-léká kábuduula* ‘to leave shorts’, *ku-éká tóondé* ‘to leave a billy-goat’.

(9) Lengthening of final vowel of preceding word caused by 9/10 N- prefix

- a. *ku-lékáá m-búsí* 'to leave a goat'
ku-lékáá n-dínú 'to leave a porcupine'
ku-lékáá n-jatí 'to leave a buffalo'
ku-lékáá n-goosa 'to leave a sheep'
- b. *ku-lékáá meémbe* 'to leave a fly'
ku-lékáá nalúmé 'to leave a young elephant'
ku-lékáá nama 'to leave an animal'
ku-lékáá njoombe 'to leave a cow'
- c. *ku-lékáá sóomba* 'to leave a fish'

It is clear from the lengthening of a preceding vowel that the nasal of these prefixes is moraic. Evidence that the moraic nasal is underlyingly *n-* is presented in (10). In these forms, the 1st person singular subject prefix is directly followed by a vowel, here the /-á-/ Past2 ("before today") tense marker.

(10) '1st person singular subject prefix' is underlyingly moraic /n-/

- a. *diisó n-áá-péleece* 'yesterday I sent'
diisó n-áá-túmilé 'yesterday I ordered'
diisó n-áá-cápiile 'yesterday I washed for (s.o.)'
diisó n-áá-kweesilé 'yesterday I climbed'
- b. *diisó n-áá-búucilé* 'yesterday I was angry'
diisó n-áá-váciile 'yesterday I built for'
diisó n-áá-lápile 'yesterday I admired'
diisó n-áá-jíimilé 'yesterday I begrudged'
diisó n-áá-góneece 'yesterday I made (s.o.) sleep'
diisó n-áá-másilé 'yesterday I finished'
diisó n-áá-némilé 'yesterday I did (sth.) incorrectly'
diisó n-áá-pásilé 'yesterday I cut into small pieces'
diisó n-áá-njáandíile 'yesterday I played around with (sth.)'
- c. *diisó n-áá-d'pilé* 'yesterday I paid'
diisó n-áá-déleele 'yesterday I underestimated'
- d. *diisó n-áá-sóosilé* 'yesterday I looked for'

There are three observations of note. First, the nasal is realized phonetically as [n-]. We are thus justified in setting up the moraic nasal either as /n-/ or as /N-/ with the alveolar realization in (10) being the result of a default spell-out as alveolar (i.e., in the absence of homorganic nasal assimilation). The second

observation is that the final vowel of /diisó/ ‘yesterday’ does not lengthen. This is explained by the third observation: the lengthening of the tense prefix -á- after the moraic nasal. As seen in (11), when the moraic nasal is followed by a vowel, the vowel spreads to the left to create a CV mora.⁷ As a result, the nasal does not delink from its mora, which in turn is not available to produce the CL of the preceding vowel seen elsewhere. The final vowel of *diisó* is thus short in all of the examples in (10). With this last bit of evidence, we are thus confident of the motivation of both the /n-/ and the mora affiliated with it.

- (11) /n-/ passes its moricity onto a following vowel:
 (hence, not onto a preceding vowel)
- | | |
|---|---|
| μ | μ |
| | |
| n | a |

Analyses of moraic nasals vary from having the nasal prelinked to an underlying mora (or equivalent) (cf. Clements [1986] and Hyman [1992]), to not having any mora underlying at all (see especially Downing [1991]). Our examination of the properties of the moraic nasal in this section has assumed a prelinked mora.⁸ In §4 we shall modify this assumption and propose a third, intermediate position, namely, one in which the mora is underlying but the nasal is not prelinked to it. One reason is that we wish to reserve the representation of a nasal prelinked to a mora for the second moraic nasal in the language, which has very different properties from the nasal prefixes we have just examined. This second moraic nasal, which we refer to as the “syllabic nasal”, is treated in the next section.

2. The Syllabic Nasal

In this section we present the properties of the second type of nasal, the syllabic nasal, whose properties should be compared to those seen in §1 concerning the moraic nasal. As we shall discuss in §3.3, this syllabic nasal derives from Proto-Bantu *mu- and even alternates with *mu-* and *mw-* in Ciyao. Since there are no

⁷ We see the leftward spreading process in (11) as identical to that in (c) in fn. 3. We should note, however, that an analysis that recognized the tense prefix as long, i.e., as -aa-, which would only slightly complicate the syllabic and tonal phonology, might be argued as an alternative.

⁸ Somewhat problematic would be for the nasal to acquire a mora by “weight by position” [Hayes 1989] or other means, to which it links and then delinks. Such an approach has been taken for other Bantu languages (e.g., Bickmore [1991], Downing [1991]). As we have seen, the mora must be underlying because of its realization when a vowel follows: the following vowel lengthens, while the preceding vowel does not. An equally compelling reason is found in Luganda, where the “moraic nasal” is realized as a geminate when followed by a vowel. Thus, compare *y-a-gúlâ* ‘he bought’ vs. *nn-a-gúlâ* ‘I bought’ (see Hyman and Katamba [1997] and references cited therein).

morpheme-internal syllabic nasals in the language, we begin by considering the 2nd/3rd person singular object prefix in (12).

(12) No lengthening before -N'- '2nd/3rd person singular object prefix'

- | | | | | |
|----|-----------------------|---|-----------------------|------------------------------------|
| a. | <i>ku-N'-péléka</i> | → | <i>ku-m'-péleka</i> | 'to send you/him' |
| | <i>ku-N'-túmá</i> | → | <i>ku-n'-túmá</i> | 'to order you/him' |
| | <i>ku-N'-cápíla</i> | → | <i>ku-ɲ'-cápíla</i> | 'to wash for you/him' |
| | <i>ku-N'-kwééla</i> | → | <i>ku-ŋ'-kwéela</i> | 'to climb on you/him' |
| b. | <i>ku-N'-búúčila</i> | → | <i>ku-m'-búúčila</i> | 'to be angry with you/him' |
| | <i>ku-N'-vácíla</i> | → | <i>ku-m'-bácíla</i> | 'to build for you/him' |
| | <i>ku-N'-lápá</i> | → | <i>ku-n'-nápá</i> | 'to admire you/him' |
| | <i>ku-N'-jímá</i> | → | <i>ku-ɲ'-jímá</i> | 'to begrudge you/him' |
| | <i>ku-N'-gónéka</i> | → | <i>ku-ŋ'-gónéka</i> | 'to make you/him sleep' |
| | <i>ku-N'-málá</i> | → | <i>ku-m'-málá</i> | 'to finish you/him' |
| | <i>ku-N'-némá</i> | → | <i>ku-n'-némá</i> | 'for you/him to not do correctly' |
| | <i>ku-N'-ɲálá</i> | → | <i>ku-ɲ'-ɲálá</i> | 'to cut you/him into small pieces' |
| | <i>ku-N'-ŋáándila</i> | → | <i>ku-ŋ'-ŋáándila</i> | 'to play around with you/him' |
| c. | <i>ku-N'-dípá</i> | → | <i>ku-n'-dípá</i> | 'to pay you/him' |
| | <i>ku-N'-déléla</i> | → | <i>ku-n'-déléla</i> | 'to underestimate you/him' |
| d. | <i>ku-N'-sóósá</i> | → | <i>ku-n'-sóósá</i> | 'to look for you/him' |

As in the case of the moraic nasal, the syllabic nasal is homorganic to the following consonant, almost the only effect that the two kinds of nasal prefixes share. Thus, as indicated in (12), the infinitive prefix *ku-* does not undergo lengthening when followed by the syllabic nasal—versus the lengthening of *ku-* that was seen before the moraic nasal in (7). In (12a) we see that voiceless consonants are not voiced after the syllabic nasal, nor do voiced consonants delete after the syllabic nasal in (12b).⁹ The forms in (12c) show the same retention of [d] as was seen after the moraic nasal. Finally, (12d) shows that the syllabic nasal, unlike the moraic nasal, does not delete when followed by /s/.

Let us now consider the distribution of the syllabic nasal in Ciyao. We have already stated that there are no morpheme-internal syllabic nasals in the language. In (13) we see that it occurs in six prefixes: the three noun prefixes in (13a) and the three verb prefixes in (13b). The three noun class prefixes are illustrated in (14), (15), and (16). As in the case of the '2nd/3rd person singular object prefix' in (12), a full range of consonants (voiceless, voiced) is found after the syllabic nasal noun class prefixes in (14)-(16).

⁹ The only consonant changes that take place after the syllabic nasal are seen in the second and third examples in (12b), where /v/ and /l/ become [b] and [n], respectively, after the syllabic nasal.

- (13) Syllabic nasal prefixes in Ciyao (no cases morpheme-internally)
- | | |
|------------------------------|------------------------------------|
| a. N'- 'class 1 noun prefix' | b. N'- '2nd person subject prefix' |
| N'- 'class 3 noun prefix' | N'- '2nd person object prefix' |
| N'- 'class 18 noun prefix' | N'- '3rd person sg. object prefix' |
- (14) Noun class 1 prefix N'-
(plural formed with class 2 *a-*, e.g., *a-palú* 'hunters', etc.)
- | | |
|---------------------|---------------------------------|
| a. <i>m'-palú</i> | 'hunter' |
| <i>n'-tágáluka</i> | 'hare' |
| <i>n'-cínga</i> | 'herdsman' |
| <i>ŋ'-kodi</i> | 'prisoner of war' |
| b. <i>m'-bulusi</i> | 'foreigner' |
| <i>n'-núpáta</i> | 'hunter' (pl. <i>a-lúpáta</i>) |
| <i>n'-jéénú</i> | 'your companion' |
| <i>ŋ'-gadíba</i> | 'master of initiation ceremony' |
| <i>m'-mágoongó</i> | 'enemy' |
| <i>n'-nami</i> | 'liar' (pl. <i>a-nami</i>) |
| <i>n'-nééló</i> | 'glutton' |
| c. <i>n'-sonogo</i> | 'spouse' |
- (15) Noun class 3 prefix N'-
(plural formed with class 4 *mi-*, e.g. *mi-piká* 'borders' etc.)
- | | |
|--------------------|---|
| a. <i>m'-piká</i> | 'border' |
| <i>n'-tééla</i> | 'tree' |
| <i>n'-cígá</i> | 'root' |
| <i>ŋ'-kúdi</i> | 'honey badger' |
| b. <i>m'-bále</i> | 'raphia palm' |
| <i>n'-nékáasya</i> | 'prohibition' (pl. <i>mi-lékáasya</i>) |
| <i>n'-jiika</i> | 'waterlily' |
| <i>ŋ'-goóle</i> | 'coconut palm' |
| <i>m'-mweénya</i> | 'rubiaceous tree (sp.)' |
| <i>n'-neega</i> | 'swarm' (pl. <i>mi-leega</i>) |
| <i>n'-ŋaalo</i> | 'bashfulness' |
| <i>ŋ'-ŋaáandu</i> | 'Morning Star, Venus' |
| c. <i>n'-dáala</i> | 'crack' |
| d. <i>n'-sáku</i> | 'bag' |

- (16) Noun class 18 locative prefix N'- 'in'
 (added outside the basic noun prefix, if any)
- a. *m'-péete* 'in the finger ring'
n'-tu-pú 'in the little bones'
n'-ci-pi 'in darkness'
n'-ka-diilole 'in the mirror'
- b. *m'-bóoma* 'in the government building'
n'-nu-piinda 'in the bag of salt' (*lu-piinda*)
n'-júuga 'in the game of cards'
n'-gólógolo 'in the weasel'
m'-ma-luma 'in the joint'
n'-namandélingwá 'in the thief'
- c. *n'-dy-oóla* 'in the frog'

Compensatory lengthening, noted previously in (8) and (9) before the moraic nasal, does not occur before the syllabic nasal. For example, the final vowel of /leeló/ 'today' preceding the '2nd person singular subject prefix' in (17) does not lengthen, nor does the FV of *ku-lék-á* 'to leave' before the class 1, 3, and 18 syllabic nasal prefixes in (18).

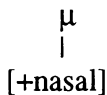
- (17) No lengthening of final vowel of preceding word before N'-
 '2nd person singular subject prefix'
- a. *leeló m'-peléece* 'today you sent'
leeló n'-tumíle 'today you ordered'
leeló n'-capíile 'today you washed for (s.o.)'
leeló n'-kweesíle 'today you climbed'
- b. *leeló m'-buucíle* 'today you were angry'
leeló m'-bacíile 'today you built for'
leeló n'-napíle 'today you admired'
leeló n'-jiimíle 'today you begrudged'
leeló n'-gonéece 'today you made (s.o.) sleep'
leeló m'-masíle 'today you finished'
leeló n'-nemíle 'today you did (sth.) incorrectly'
leeló n'-nasíle 'today you cut into small pieces'
leeló n'-naandíile 'today you played around with (sth.)'
- c. *leeló n'-dipíle* 'today you paid'
leeló n'-deléele 'today you underestimated'
- d. *leeló n'-soosíle* 'today you looked for'

(18) No lengthening of final vowel of preceding word caused by classes 1, 3, or 18 N'- prefix

- a. *ku-léká* *m'-palú* 'to leave a hunter (cl.1)'
ku-léká *n'-téélá* 'to leave a tree (cl. 3)'
ku-léká *ǰ'-ci-pi* 'to leave in darkness (cl.18)'
ku-léká *ǰ'-kodi* 'to leave a prisoner of war (cl.1)'
- b. *ku-léká* *m'-bále* 'to leave a raphia palm (cl.3)'
ku-léká *n'-nu-piinda* 'to leave in a bag of salt (cl.18)' (< lu-piinda)
ku-léká *ǰ'-jiika* 'to leave a waterlily (cl.3)'
ku-léká *ǰ'-goóle* 'to leave a coconut palm (cl.3)'
ku-léká *m'-mágoongó* 'to leave an enemy (cl. 1)'
ku-léká *n'-nami* 'to leave a liar (cl.1)'
ku-léká *ǰ'-ǰééló* 'to leave a glutton (cl.1)'
ku-léká *ǰ'-ǰaáandu* 'to leave the Morning Star (cl. 3)'
- c. *ku-léká* *n'-sáku* 'to leave a bag (cl.3)
- d. *ku-léká* *n'-dy-oóla* 'to leave in a frog (cl. 18)'

As the tone-markings indicate, these phonetically syllabic nasal prefixes are also tone-bearing units and for this reason also require a mora in their underlying representation. If we compare the data from this section with the data in §1, however, it becomes immediately obvious that moraic-and-syllabic nasals are not only phonetically distinct from moraic nasals, but also have vastly different phonological properties. This then raises the question of how they should differ in representation. We have assumed in the preceding discussion that the moraic nasal has a representation such as that in (19a). If correct, this would mean that the syllabic nasal must be presyllabified, as in (19b). Since, as we shall see, the syllabic nasal derives from Proto-Bantu *mu-, these representations mirror the intuition we first held that the syllabic nasal is a syllable while the moraic one is not.

(19) a. Moraic nasal (N)



b. Syllabic nasal (N')



Under this approach, one could propose that the moraic nasal is free to have its effects (particularly lengthening of the preceding vowel) *because* it is not syllabified. The syllabic nasal, by contrast, being already rigidly prosodified,

would be stable and non-interactive with the surrounding segments. This view is consistent with the notion that a syllabic element should be a syllable, as well as with the diachronic source of syllabic nasals in general. As is clear from such studies as Kadima [1969] and Bell [1972]) the moraic nasal existed already in Proto-Bantu, whereas syllabic nasals such as found in Ciyao derive from **mu*-sequences—which clearly constitute a syllable.¹⁰ In the following section we shall see that the syllabic nasal, in fact, alternates with *mu*- and *mw*- in Ciyao. Despite this, we will argue for another interpretation of the two types of moraic nasals in this language, namely, that it is the *syllabic* nasal that has the representation in (19a), not the moraic nasal. We shall begin by demonstrating that a sequence of (C)V + syllabic nasal is one syllable not two—and that it is therefore not necessary to assume the presyllabification of N'-.

3. Against the presyllabification of N'-

In this section we wish to argue for an analysis that does not stipulate the presyllabification of N'- prefixes. The argument will center around a demonstration that (C)V+N' sequences constitute one syllable rather than two.¹¹ Evidence will be presented from three sources: vowel shortening, tonal decontouring, and allomorphy (*mu*-/*mw*- vs. N'-).

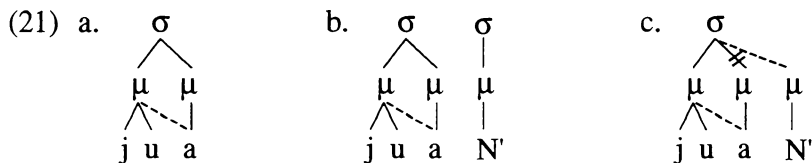
3.1. Vowel shortening. The first argument is that vowels shorten before N'-C sequences. The forms in (20) involve the same Past2 “before today” past tense prefix -*á*- seen earlier in (10). The subject prefixes utilized are the moraic nasal N- ‘1st person singular’, *ju*- ‘third person singular’ (class 1), *tu*- ‘first person plural’ and *va*- ‘third person plural’ (class 2). In (20a) we see that the first syllable in all cases involves a long [aa]. As shown in (21a), this length derives from the spreading of the -*á*- prefix onto the preceding moraic subject prefix (see (11) and note 2). Note, however, that before a syllabic nasal the vowel [á] is short, as in (20b). The question is why?

¹⁰ More rarely in other languages, particularly in the Northwest of the Bantu zone, they may derive also from **mi*- and **ma*-.

¹¹ As far as we know, the question of whether a sequence of (C)V + syllabic consonant constitutes one vs. two syllables has not been addressed. In languages which do not have bimoraic syllables, the bisyllabic solution would seem to be imposed. Otherwise the answer may require close scrutiny on a language by language basis. What was striking to us in this study was that we initially assumed that the syllabic nasal constituted its own syllable—in fact as a lingering conservative feature of its former *mu*- shape. More striking to us now is how clear the arguments are against this assumption, at least for Ciyao.

(20) Vowel shortening before N'

a.	<i>n-aa-péleéce</i>	'I sent'	b.	<i>n-á-m'-peleéce</i>	'I sent you/him'
	<i>jw-aa-péleéce</i>	'he sent'		<i>jw-á-m'-peleéce</i>	'he sent you/him'
	<i>tw-aa-péleéce</i>	'we sent'		<i>tw-á-m'-peleéce</i>	'we sent you/him'
	<i>v-aa-péleéce</i>	'they sent'		<i>v-á-m'-peleéce</i>	'they sent you/him'



If we assume that the syllabic nasal is a separate syllable, as in (21b), we have no explanation. If, on the other hand, we assume that the syllabic nasal is moraic, but not syllabic, as in (21c), the explanation is at hand: As Clements [1986] demonstrated for Luganda, the syllable is maximally bimoraic in Ciyao. Thus, when the nasal joins the syllable in (21c), it is necessary that one of the other moras be delinked from the syllable node so as to avoid a trimoraic syllable. As indicated, and following Hyman and Katamba [1997], we assume it is the internal mora that is effaced in this way.¹² This then constitutes the first argument that N' joins a preceding (C)V in the same syllable.

3.2. Tone decontouring. Additional arguments that N' functions the same as a V mora can be found in the tonal phonology of the language. Ciyao has two tones, H(igh) and L(ow), with a maximum of one tone per vowel. HL and LH contours are possible only under very restricted circumstances. One pervasive constraint is that a H tone may not begin on a V mora if the following (CV) mora is also H. When such a sequence risks occurring, as in (22a,b), the left branch of a doubly linked H is delinked.¹³

¹² Dealing with comparable phenomena, Hyman and Katamba [1997] propose that syllabification is edge-in in Luganda. In cases where three or more vocalic moras occur in sequence, e.g., in a CVVVV input string, the initial CV mora and the last V mora are syllabified, with all intervening moras being stray erased.

¹³ Hyman and Ngunga [1994] refer to the delinking in (22a) as contour simplification, while Odden refers to it as "no rise" [Odden, In press]. Since the initial CV mora in (22a) would receive a default L tone, delinking of the left branch of the H avoids a CVV syllable with a LH rising tone. If we assume an obligatorily present L tone, as in (22c), which links to the V mora (there labeled as μ_w , following Zec [1988]), then we can also view the process as one of linking (or spreading) of this L onto the V mora, thereby requiring by the one-tone-per-mora maximum that the H delink.

(22) Left-branch H-delinking (restricted to VCV sequences)



As shown in (22), the H tone VCV sequence may either be preceded by a CV mora, as in (22a), or be initial in its intonational phrase (IP), as in (22b). The first situation is illustrated in the negative Past2 “before today” tense forms in (23). The prefixes involved here are *ngani-* ‘negative Past2’ and *-ju-* ‘3rd person singular’ (class 1).

(23) a.	ngani-ju-divadil-a	b.	ngani-ju-piikan-a	Input
	 H		 H	
	ngani-ju-divadil-a		ngani-ju-piikan-a	H tone spreading
	∨ H		∨ H	
	n/a		ngani-ju-piikán-a	H delinking
			 H	
	‘he didn’t forget’		‘he didn’t hear’	

The input forms show the regular assignment of a morphological H tone to the second mora of the verb stem (= the verb minus any prefixes) in this tense. This is followed by a rule of H tone spreading (HTS) that spreads the H to the following mora. In (23a) the derivation stops there. In (23b), however, HTS produces the input to (22a) and the left branch of the H is delinked.

Now consider another tense where we can test the tonal behavior of the syllabic nasal. The Fut2 (general future) forms in (24) are marked by one prefix *ci-* preceding the subject prefix and another prefix *-ci-* following it. In this tense the only input H is the one prelinked with the subject prefix, here *-jú-* ‘3rd person singular’ (class 1), *-á-* ‘3rd person plural’ (class 2), and *-N’-* ‘2nd person singular’. Again, the derivation begins with HTS. In (24a) nothing further happens. In (24b), the left branch of the doubly linked H is delinked as per (22a). Significantly, the same thing happens in (24c), where the left branch of the H is delinked from the syllabic nasal. This shows that N’- has the same property as a V mora (and crucially does not behave like its CV- source *mu-).

(24) Fut2 *ci...ci-*

a. ci-ju-ci-lam-a	b. ci-a-ci-lam-a	c. ci-N'-ci-lam-a	Input
 H	 H	 H	
ci-jú-cí-lam-a	c-aa-ci-lam-a	ci-n'-ci-lam-a	H tone spreading
∨ H	∨ H	∨ H	
n/a	c-aa-cí-lam-a	ci-n'-cí-lam-a	H delinking
	 H	 H	
'he will survive'	'they will ____'	'you will ____'	

The same conclusion can be drawn with respect to the related process in (22b). To illustrate this, consider the present tense forms in (25). In these forms, the infinitive prefix *-ku-* also marks the present tense. The underlying H tones appear on the subject prefix are *jú-*, *á-* and *N'-* as well as on the root *-dí-* 'eat', which is preceded by the class 7 object prefix *-ci-* 'it'.

(25) Present tense *-ku-*

a. ju-ku-ci-di-a	b. a-ku-ci-di-a	c. N'-ku-ci-di-a	Input
 H H	 H H	 H H	
jú-kú-ci-di-á	a-ku-ci-dy-a	ŋ-ku-ci-dy-a	H tone spreading
∨ H H	∨ H H	∨ H H	
n/a	á-kú-ci-dy-á	ŋ-kú-ci-dy-á	H delinking
	 H H	 H H	
'he is eating it'	'they are ____'	'you are ____'	

After HTS applies, (25a) has a CVCV sequence with H tone and is well-formed. In (25b), however, the initial H sequence is VCV and H delinking must apply to the left branch of the H. The same occurs in (25c), which has the structure N'CV and where the H delinks from the syllabic nasal.

The above are not the only cases where N'- functions exactly as a V mora. Two additional tonal processes are presented in (26). Using Zec's [1988] labeled

moras, where $\mu_w = a$ V mora, (26a) shows that when a H occurs solely to the V mora of a CVV syllable (i.e., is not doubly linked to the next CV mora), instead of delinking, it spreads onto the preceding head mora (μ_s). In the example *kú-úv-á* 'to hide (intr.)' in (26a), the FV *-á* is H tone, but its tone is from a second H feature (see [Hyman and Ngunga 1994]).

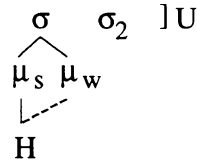
(26) When H is non-branching, disallowed contours are resolved by left- and right- HTS

a. LH \rightarrow HH



e.g. *kú-úv-á*
 H H
 'to hide (intr.)'

b. HL \rightarrow HH



In the example in (26a), the rule of leftward HTS applies to what is clearly a CVV syllable. The question is what happens when we have a CVN' sequence with a single H on the syllabic nasal? We can test this in the Fut1 (near future) forms in (27). In this tense, a H tone tense prefix *cí-* precedes the toneless subject prefix *tu-* '1st person plural', which undergoes HTS. The FV is exceptionally *-e* (vs. the more frequent *-a*).

(27) Realization of an underlyingly toneless noun prefix following verbs that place a H on next mora ['we will leave _____']

- a. *cí-tú-lec-e cí-wuko* '_____ a bag' (< *ci-wuko* (cl. 7))
cí-tú-lec-e mí-jiika '_____ waterlilies' (< *mi-jiika* (cl.4))
- b. *cí-tú-lec-éé ŋ-goosa* '_____ a sheep' (< *ŋ-goosa* (cl. 9))
cí-tú-lec-éé pama '_____ an animal' (< *p-pama* (cl. 9))
- c. *cí-tú-lec-é á-palú* '_____ hunters' [le.cáá] (< *a-palú* (cl. 2))
cí-tú-lec-é á-nami '_____ liars' [le.cáá] (< *a-nami* (cl. 2))
- d. *cí-tú-lec-é əm'-palú* '_____ a hunter' *[le.cə m'] (< *m'-palú* (cl. 1))
cí-tú-lec-é ən'-jiika '_____ a waterlily' *[le.cə n'] (< *n'-jiika* (cl. 3))
cí-tú-lec-é ən'-ci-pi '_____ in darkness' *[le.cə n'] (< *n'-ci-pi* (cl. 18))

As shown in (27a), this tense places a H tone on the prefix mora of the following noun, which in the two examples has the shape CV-. The forms in (27b) have class 9 object nouns, i.e., nouns with a moraic nasal prefix which in principle would receive the H tone. Since the nasal leaves its mora as per the

discussion in §1, the FV of the verb spreads to take its place and as a consequence is phonetically long. Since this mora derives from the noun prefix, it has a post-verbal H tone. However, instead of deriving *cí-tú-lec-eé, the leftward HTS rule in (26a) converts the FV to -éé, i.e., with a H tone long vowel. The same happens in (27c) where there is a vowel sequence -e + á-. As seen to the right of the glosses, this sequence undergoes vowel coalescence and instead of a rising tone *-aá, (26a) again guarantees that -áá will be obtained. Finally, and most important to our demonstration, is the fact seen from the forms in (27d) that N'- behaves exactly the same way: Here we obtain a surface H tone on the FV -é as well as on the syllabic nasal! If N'- were its own syllable (like the CV- prefixes in (27a)), we would have expected the asterisked outputs to the right of the glosses in (27d). Again, N'- acts like any other V- mora.

The final tonal argument comes from the rule in (26b). As seen in (28a), a sequence HL-L is permitted if the falling tone is a penultimate CVV syllable. The HL is created by HTS. As seen in (28b), however, if the CVV is pre-penultimate, the HL created by HTS cannot surface as such. Instead, the rule in (26b) effects a second spreading such that one obtains a CVV with both moras H.

(28) HL falling tone cannot be followed by two or more toneless syllables

a. ku-sévées-a 'to work'

↓
H

b. ku-mányíidil-a 'to know'

↓
H

c. tu-tum-íl-e 'we ordered'

|
H

d. tu-tum-íl-é cǐ-tove 'we ordered a pixie'

↓
H

e. tu-tum-íl-e á-palú [..láá..]

↓
H

f. tu-tum-íl-é m'-palú

↓
H

'we ordered hunters'

'we ordered a hunter'

The rule in (26b) allows us again to test whether a CVN' sequence will function the same as a CVV syllable or not. The input verb form to this test is given in (28c): the Past1 ("today past") tense places a H on the second mora of the verb stem, which is not allowed to spread to the FV at the end of a phrase. In (28d) it does spread to the FV -e, but does not affect the CV class 7 prefix *ci-*. In (28e) we have the sequence *le+a* which joins together to form a single [láá] syllable. When HTS applies to the FV -e, it creates a HL syllable that is pre-penultimate. As a result, (26b) must apply and convert this syllable to an all H [láá]. The form in (28f) is parallel except that the noun prefix is the syllabic nasal

of class 1. As shown, the output is the same as in (28e): HTS produces a [lém̀] sequence in prepenultimate position. If this were two syllables, it would not be clear why it could not surface as such. Since it obligatorily becomes [léḿ], we assume this is because a CVN' sequence is syllabified into a single syllable. For this reason its effect on both duration and tone is indistinguishable from a CVV syllable. Both are bimoraic syllables with the same properties.

3.3. Allomorphy. We have already alluded to the fact that the syllabic nasal prefixes of Ciyao are all derived historically from Proto-Bantu *mu-. The process of diachronic development, further exemplified by Kadima [1969] and Bell [1972] is shown in (29).

(29) Proto-Bantu *mu-C > m'-C > N'-C

First, the vowel *u is lost, absorbed by labiality of the preceding *m, producing a syllabic *m-*. Then this syllabic *m'-* undergoes homorganic nasal assimilation.¹⁴ All six of the syllabic nasal prefixes listed in (13) derive from forms which Meeussen [1967] has reconstructed as *mu-.¹⁵ It does not come as a surprise, therefore, that N'- alternates with *mu-* and *mw-* in Ciyao. Consider then the realization of the 2nd person subject prefix in the imperative forms in (30).

¹⁴ The process of *u absorption is particularly favored by the presence of a following stem-initial labial consonant. Note that there are dialects of Ciyao which have syllabic *m-*, i.e., which have not yet subjected the syllabic bilabial nasal to homorganic nasal assimilation.

¹⁵ As indicated in (13) this includes three noun class prefixes (1, 3, 18) and three verb prefixes: *mu-* '2nd person plural subject prefix', *-mu-* '3rd person singular (class 1) object prefix', and *-mu-* '2nd person plural object prefix'. There has been some semantic realignments, particularly involving 2nd vs. 3rd person and singular vs. plural (see Mbagá and Whiteley [1961]). Curiously, one additional prefix in Ciyao, the class 18 object prefix *-mu-*, also corresponding to Proto-Bantu *mu-, may not become a syllabic nasal. As seen in the following forms, it must instead be realized as *-mu-*:

Class 18 *-mu-* object prefix 'in (it)' does not become -N'-:

- | | | | | |
|----|----------------------|----------------------------|-----------------------|------------------------------------|
| a. | <i>ku-mu-péléka</i> | 'to send in (it)' | <i>ku-mu-cápíla</i> | 'to wash for in (it)' |
| | <i>ku-mu-túmá</i> | 'to order in (it)' | <i>ku-mu-kwééla</i> | 'to climb on in (it)' |
| b. | <i>ku-mu-búúčila</i> | 'to be angry with in (it)' | <i>ku-mu-málá</i> | 'to finish in (it)' |
| | <i>ku-mu-lápá</i> | 'to admire in (it)' | <i>ku-mu-némá</i> | 'for in (it) to not do correctly' |
| | <i>ku-mu-jjímá</i> | 'to begrudge in (it)' | <i>ku-mu-pálá</i> | 'to cut in (it) into small pieces' |
| | <i>ku-mu-gónéka</i> | 'to make in (it) sleep' | <i>ku-mu-páándíla</i> | 'to play around with in (it)' |
| c. | <i>ku-mu-dípá</i> | 'to pay in (it)' | <i>ku-mu-déléla</i> | 'to underestimate in (it)' |
| d. | <i>ku-mu-sóósá</i> | 'to look for in (it)' | | |

(30) N'- /mw- /mu- alternations in Ciyao

(2nd person subject prefix in imperative)

- a. N'-*túme* → *n'-túme* 'order!'
 b. *mú-á-túme* → *mw-áá-túme* 'order them!' (-a- 'class 2 object prefix')
 c. *mú-ń-túme* → *múú-n-dúme* 'order me!' (-ń- '1 pers. sg. obj. prefix')
 d. *mú-N'-túme* → *mú-ń'-túme* 'order him!' (-N'- '3 pers. sg. obj. prefix')

When followed by a consonant—here stem-initial /t/—the form of the 2nd person subject prefix is the syllabic nasal seen in (30a).¹⁶ When followed by a vowel such as the 3rd person plural prefix (class 2) -a- in (30b), the output is [mwáá], suggesting an input /mú-á-/. In (30c), the 2nd person subject prefix is followed by the moraic nasal of the 1st person singular object prefix. As shown, the output is [múú] followed by a prenasalized consonant, suggesting the input /mú-N'-/. Finally, in (30d), the 2nd person subject prefix is followed by the syllabic nasal of the 3rd person singular object prefix. As indicated, the phonetic realization [mú-ń'] suggests an input /mú-N'-/.

From the examples in (33), it appears that a syllabic nasal will occur only if the morpheme in question is directly followed by a consonant (other than a moraic or syllabic nasal). The same alternations can be observed in the corresponding noun class prefixes. The forms in (31), (32), and (33) show the realization of class 1, 3, and 18 noun class prefixes when followed, respectively, by a vowel, a moraic nasal, and a syllabic nasal. The results are the same as in the imperative: In (31) we obtain [mw-] followed by a long vowel. In (32) we obtain [muu] followed by a prenasalized consonant. Finally, in (33) the class 18 prefix (which alone among the three can be followed by another noun class prefix) is realized [mu-] followed by a syllabic nasal.

(31) Realization of class 1, 3, and 18 noun prefixes as *mw-* before a vowel

- a. *mw-íipwa* 'son or daughter' (class 1)
mw-eénye 'master'
mw-aanáce 'child'
mw-aadimú 'teacher'

¹⁶ In this tense the subject prefix carries a H tone, which also spreads to the next vowel. In (30a) the left-branch H-delinking rule has removed the H from the subject prefix itself.

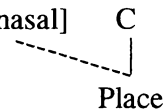
- b. *mw-aanda* 'great number' (class 3)
mw-aango 'elephant's trunk'
mw-iimbila 'burrow'
mw-iisámuló 'sneeze'
- c. *mw-ii-gaasa* 'handful' (class 18)
mw-ii-tála 'in the path'
mw-aa-leendo 'in the guests'
mw-aa-sávi 'in the wizards'
- (32) Realization of class 1, 3, and 18 noun prefixes as *mu-* before moraic N- (which causes length)
- a. *muu-ndu* 'person' (class 1)
- b. *muu-n-dálaanga* 'kind of dance' (class 3)
muu-n-jala 'abaceous tree (sp.)'
muu-n-gwe 'plant-bearing fruit'
- c. *muu-m-búsi* 'in a goat' (class 18)
*muu-meémbe*¹⁷ 'in a fly'
muu-n-dínú 'in a porcupine'
muu-sóomba 'in a fish'
- (33) Realization of locative class 18 noun prefix as *mu-* before syllabic N'- (with no length)
- a. *mu-m'-palú* 'in a hunter' (class 18+1)
mu-ŋ'-cíinga 'in a herdsman'
mu-n'-nami 'in a liar'
mu-n'-sonogo 'in a spouse'
- b. *mu-m'-piká* 'in a border' (class 18+ 3)
mu-ŋ'-goóle 'in a coconut palm'
mu-n'-sáku 'in a bag'
mu-n'-téélá 'in a tree'
- c. *mu-m'-péete* 'in a finger-ring' (class 18+18)
mu-n'-tulúpu 'in a card game'
mu-m'-báasi 'in a bus'
mu-ŋ'-kaáta 'in a calabash cup'

¹⁷ These last two forms are from *mu-m-meémbe* and *mu-n-sóomba*, respectively.

How should these alternations be accounted for? What we have labeled a “standard derivational account” is presented in (34). Mirroring the historical events, (34a) first deletes the [u] of *mu-* prefixes when followed by a consonant.¹⁸ Homorganic nasal assimilation then applies as in (34b), spreading the place of articulation of a consonant onto the preceding nasal.

(34) Standard derivational account

a. $u \rightarrow \emptyset / [m _ [C$

b. $[+nasal] \quad C$

 Place

For this account to work, however, it is necessary that the “C” in (34a) not include either the moraic nasal or the syllabic nasal itself (both of which are presumably [+cons]). One might think of invoking some form of the obligatory contour principle (OCP) to block the development of a syllabic nasal before a nasal. Note first that the syllabic nasal *is* derived before a non-moraic nasal (see the examples in (12b), (14b), (15b), (16b), etc.). Worse yet, as we shall now show, a syllabic nasal can also be derived before an underlying prenasalized consonant, the third source of prenasantal nasal referred to above in (1c).

As shown in (35), unlike Proto-Bantu, Ciyao has a certain number of verb roots that begin with a prenasalized consonant. This prenasantal nasality does not cause lengthening of a preceding vowel, i.e., the infinitive prefix *ku-* has a short vowel in these forms. It therefore cannot be equated with the moraic nasal. Nor can it be identified with the syllabic nasal, from which it is phonetically distinct (shorter, non-syllabic).

(35) Underlying prenasalized consonants:

no vowel lengthening before NC-initial verbs

ku-ndúúndumila ‘to shiver, as with cold’

ku-ŋjóŋjoka ‘to hop like a bird’

ku-ŋgúúmbá ‘to deceive’

ku-ŋgálágandula ‘to startle’

¹⁸ It is clear that only prefixes are involved here. First, [mu] stem syllables do not become [m’]. Thus, *lu-mudi* ‘torch (in general)’ and *n-dumu* ‘earthenware (or china) cup (no handle)’ may not become *lu-n’di* or *n-dum’*. Also, the class 18 enclitic =*mú* may not become =*m’*: *mu-m-pik* =*mú* ‘in this border’ (**mu-m-pikáá* =*m’*).

We must therefore set up a third type of prenasalizing: a single underlying consonant within which a change from [+nasal] to [-nasal] is effected. The rule of HTS seen earlier and again exemplified in (36) provides tonal evidence that this is the right analysis.

(36) N in verbs with exceptional non-lengthening of V's before internal NC ≠ a TBU

- | | | |
|----|---------------------|------------------------|
| a. | <i>ku-téléka</i> | 'to cook' |
| | <i>ku-đívádila</i> | 'to forget' |
| b. | <i>ku-táámila</i> | 'to sit on' |
| | <i>ku-sáádila</i> | 'to inform' |
| c. | <i>ku-lóóndela</i> | 'to target at' |
| | <i>ku-páándila</i> | 'to sow for' |
| d. | <i>ku-bámbádika</i> | 'to bolt one's food' |
| | <i>ku-bángúla</i> | 'to roar' |
| | <i>ku-lámbwánda</i> | 'to boil' |
| | <i>ku-mángála</i> | 'report a case at law' |

In these verb forms there is an input H tone on the first mora of the verb stem which, by the regular rule of HTS, spreads onto the next mora. In (36a), where the first stem syllable is CV, the H spreads onto the vowel of the second syllable. In (36b), where the first stem syllable is CVV, the H spreads onto the second V of this syllable. In (36c), where a moraic nasal has lengthened the V of the first syllable, again HTS spreads the H onto the second mora of the initial syllable. The crucial test examples are those in (36d), which begin with a CVNCV string, i.e., where the first stem vowel is followed by a NC but is nonetheless short. As seen, HTS spreads the H in this case onto the next syllable. We thus safely conclude both from the length and tone facts that this third type of prenasalizing should be analyzed as an underlying prenasalized consonant.

Now consider the realization of the syllabic nasal prefixes before an underlying prenasalized consonant. In (37a) we note that the vowel of *tu-* '1st person plural subject prefix' is realized short. This is consistent with our analysis of these NC initials as prenasalized consonants (which have no mora to which the preceding vowel can spread). Also consistent are the facts in (37b). Here we see that stems beginning with a prenasalized consonant take the syllabic nasal variant—rather than the *mu-* variant—of the 2nd person subject marker.

(37) 2nd pers. subj. prefix N'- used before NC-initial verbs

- | | | |
|----|------------------------|--------------------------|
| a. | <i>tu-ndúúndumile</i> | 'let's shiver!' |
| | <i>tu-ŋjóónjoce</i> | 'let's hop like a bird!' |
| | <i>tu-ŋgúumbe</i> | 'let's deceive!' |
| | <i>tu-ŋgálagandule</i> | 'let's startle!' |
| b. | <i>n'-ndúúndumile</i> | 'shiver!' |
| | <i>n'-ŋjóónjoce</i> | 'hop like a bird!' |
| | <i>n'-ŋgúumbe</i> | 'deceive!' |
| | <i>n'-ŋgálagandule</i> | 'startle!' |

The same phenomenon is observed in (38) with respect to the '2nd/3rd person object prefix'.¹⁹ In (38a), the '1st person plural object prefix' *-tu-* is realized short, and in (38b), the '2nd/3rd person object prefix' is realized as N', not as *mu-*.

(38) 2nd/3rd object prefix N' is also used before NC-initial verbs

- | | | |
|----|----------------------------|----------------------------------|
| a. | <i>ku-tu-ŋgúúmb-il-a</i> | 'to deceive for us' |
| | <i>ku-tu-ŋjóónjoc-el-a</i> | 'to hop like a bird for us' |
| b. | <i>ku-n'-ŋgúúmb-il-a</i> | 'to deceive for you/him' |
| | <i>ku-n'-ŋjóónjoc-el-a</i> | 'to hop like a bird for you/him' |

Finally, note in (39) that the same facts are to be found in nouns as well. In (39a) we see that there are nouns beginning with a short CV prefix followed by a stem-initial prenasalized consonant. In (39b) and (39c), we see examples of class 1 and class 3 nouns, respectively, which begin with a prenasalized consonant and, hence, take the N'- prefix variant (not *mu-*).²⁰

Given these data, it is clear that the use of /mu-/ before both the moraic and the syllabic nasals cannot be due to an OCP effect. Instead, we suggest an analysis in terms of allomorphy that, in fact, supports our view that N'- should not be analyzed as prelinked to its own syllable node. The generalization that emerges from the facts of this subsection is given in (40).

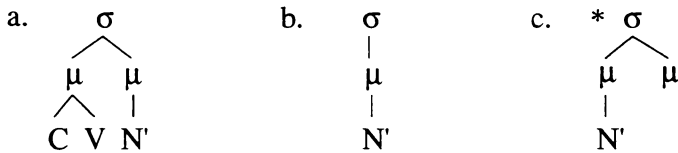
¹⁹ In these forms we have added the applicative suffix *-il/-el-* 'for' (benefactive).

²⁰ Finally, we note that when a moraic nasal is followed by a prenasalized consonant, the moraic nasal simply drops out, potentially lengthening a preceding vowel, e.g., *ku-N-ŋgúúmb-il-a* → *kúu-ŋgúúmb-il-a* 'to deceive for me' (vs. *ku-ŋgúúmb-il-a* 'to deceive for').

(39) N'+prenasalized consonant also found in classes 1 and 3

SINGULAR		PLURAL	CLASSES
a. <i>di-ndaanda</i>	'egg'	<i>ma-ndaanda</i>	5/6
<i>ci-ndóolo</i>	'sweet potato'	<i>yi-ndóolo</i>	7/8
b. <i>n'-njusi</i>	'beggar'	<i>a-njusi</i>	1/2
c. <i>n'-ndógoodya</i>	'climbing shrub (sp.)'	<i>mi-ndógoodya</i>	3/4
<i>n'-ndíimu</i>	'lemon tree'	<i>mi-ndíimu</i>	3/4
<i>ŋ'-ŋguunŋa</i>	'euphorbiaceous tree (sp.)'	<i>mi-ŋguunŋa</i>	3/4

(40) Generalization: N'- appears only as last mora of its syllable



Given the limitations on Ciyao syllable structure, there are logically three places where a syllabic nasal could be found. Two of these are realized: In (40a) we see the N' may appear as the second mora of a bimoraic syllable. In (40b) we see the N' can appear as the sole mora of a monomoraic syllable. Where it cannot appear, as indicated in (40c), is as the first mora of a bimoraic syllable. In other words, rather than deriving N' from /mu-/ phonologically, it is possible to introduce a statement of allomorphy, as given in (41). In (41a) we see that the relevant prefixes are spelled out as mu- if they can be syllabified as the first mora of a bimoraic syllable. In (41b) we treat N'- as the elsewhere case, i.e., appearing if either the second mora of a bimoraic syllable or as the sole mora of a monomoraic syllable.²¹

(41) Allomorphy statement of N'-/mu- prefixes

- a. prefix → mu- if occurring as the first mora of a bimoraic syllable
 b. prefix → N'- elsewhere

It should be clear that a statement such as (41) would be possible only if we recognized a CVN' sequence as one syllable, as in (40a). If the syllabic nasal were its own syllable, we would be especially hard put to explain why we cannot get

²¹ It would, of course, be possible to reformulate the statement so that N'- is spelled out "as the final mora of a syllable", with mu- being the elsewhere case. We prefer the first solution since we believe that N' is the general case—and may even some day replace mu- in some or all of the environments in which it now occurs.

more than one syllabic nasal in a row, i.e. why (30d) is not realized *ń'-ń'-túme 'order him!' The allomorphy we have proposed is in fact an instantiation of Hyman and Katamba's [1997] "Avoid σ [VV" in Luganda.²² As support for this view, we cite in (42) additional evidence that Ciyao uses allomorphy to avoid VV syllables. The forms in (42a) show that the class 2 noun prefix (Proto-Bantu *ba-) is realized *a-* when followed by a consonant. In (42b), however, we see that its form is *va-* when followed by a vowel (with which it coalesces). The one example in (42c) shows the allomorph *va-* when followed by the moraic nasal of the stem *-ndu* 'person, people'. Here, as with *N'*-, it is clear that the CV-allomorph is the historical form and that the non-branching mora variant is the innovation. The reason for not extending it to the forms in (42b) is that VV syllables would result. The same would be true in (42c), where an input */a-ndu/ would surface as [aandu], i.e., with an initial VV syllable.²³

(42) *a-/va-* allomorphy in class 2 noun prefixes

- | | | | |
|----|-------------------|-----------------|------------------------|
| a. | <i>a-cíinga</i> | 'herdsman' | (sg. <i>ɲ'</i> -) |
| | <i>a-siváni</i> | 'cross-cousins' | (sg. <i>n'</i> -) |
| | <i>a-tágáluka</i> | 'hare' | (sg. <i>n'</i> -) |
| | <i>a-culúúsi</i> | 'peddler' | (sg. <i>ɲ'</i> -) |
| b. | <i>vá-áná</i> | 'children' | (sg. <i>mw-ááná</i>) |
| | <i>v-eénye</i> | 'masters' | (sg. <i>mw-eénye</i>) |
| | <i>v-eéno</i> | 'fellow' | (sg. <i>mw-íino</i>) |
| c. | <i>vaa-ndu</i> | 'people' | (sg. <i>muu-ndu</i>) |

We thus conclude not only that *N'*- does not constitute its own syllable, but that its distribution is determined by its position in the syllable (which it shares with a preceding CV mora).

²² This extension of Itô's [1989] onset condition has figured in various presentations on the Luganda syllable since 1993, now Hyman and Katamba [1997]. Bantu languages such as Luganda and Ciyao thereby attempt to avoid VV syllables, which violate both the onset principle as well as have complex (bimoraic) structure. It is natural then that VV would rank lowest among the few syllable types available in these languages.

²³ This *va-/a-* allomorphy characterizes all class 2 concords within the noun phrase, e.g., on possessives, demonstratives, etc. The class 2 subject prefix, on the other hand, shows a slightly different allomorphy. A comparison of the forms in (a) and (b) will reveal that the class 2 subject prefix is realized *va-* before a vowel, but is realized *a-* not only before a consonant but also before a moraic nasal or a syllabic nasal.

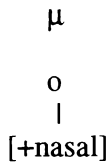
- | | | | | |
|-----|-----------------------|-----|------------------------------|---------------------|
| (a) | P1 (today) past tense | (b) | P2 (before today) past tense | |
| | <i>a-tumíle</i> | | <i>v-aa-túmílé</i> | 'they sent' |
| | <i>a-n-dúmíle</i> | | <i>v-áá-n-dumílé</i> | 'they sent me' |
| | <i>a-n'-túmíle</i> | | <i>v-á-ń'-tumílé</i> | 'they sent him/you' |

4. Conclusion

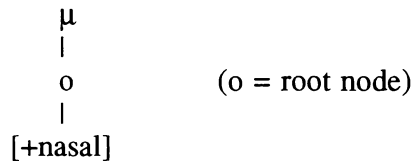
In the preceding sections we have surveyed the properties of three types of preconsonantal nasality: the moraic nasal, the syllabic nasal, and a third type of preconsonantal nasality whose representation was said to be that of an underlying prenasalized consonant. While the distinction in representation of the two moraic nasals was said to be the presence vs. absence of a prelinked syllable node in (19), in §3 we failed to establish any evidence for underlying syllable structure in the case of the syllabic nasal. Evidence from vowel length, tone and allomorphy led to the inescapable conclusion that CVN' sequences syllabify as a single syllable. Given the current fashion in phonology to minimize structure-changing derivations and the principle of "lexicon optimization" [Prince and Smolensky 1993], we propose to streamline the earlier representations of (19) into those in (43).

(43) Representations with projected-unlinked vs. projected-linked moraic nasals (cf. Zec [1992])

a. Moraic nasal (N)



b. Syllabic nasal (N')



As implied in the title of this paper, there are indeed two kinds of moraic nasal—and neither one of them need constitute a syllable on its own. Using Zec's [1992] notion of mora projection, we can say in (43a) that the moraic nasal has a projected, but unlinked mora vs. the moraic-and-syllabic nasal in (43b), which has a projected and linked mora. One consequence of having the moraic nasal unlinked in (43a) is that the question raised in §1 of whether to interpret compensatory lengthening as resulting from a "push" or "pull", as illustrated in (5), now disappears.

To the representations in (43), we need only add in the spirit of optimality theory [Prince and Smolensky 1993] a hierarchy of constraints such as in (44).

(44) Preserve Moraic Links >> Avoid Moraic Nasals >> Avoid Prenasalized Consonants

The fate of (43a,b) will be determined in part by these ranked constraints: (43a) will involve the linking of the [+nasal] root node to the following mora, since avoiding moraic nasals is higher ranked than avoiding prenasalized consonants. When followed by a consonant, (43b), on the other hand, will remain a moraic

nasal (rather than creating a prenasalized consonant) because preserving underlying moraic links is ranked higher than avoiding moraic nasals. The choice of the *mu-* allomorph over *N'*- is in turn a case of phonologically conditioned allomorphy. As indicated above, it is motivated by the desire to avoid VV syllables, ranked high in Ciyao.²⁴

While we are quite pleased with our result, it is perhaps useful to keep an open skeptical mind. Thus, in the interest of completeness, we offer the following concerns that we still have about the argumentation that we have presented in favor of CVN' as one syllable.

First, concerning the argument made on the basis of vowel shortening, we note that some languages have vowel-shortening rules in a strictly vocalic context. Thus, as indicated in (45a), Gokana shortens a long vowel which immediately follows another vowel, while in (45b), Kikamba shortens a vowel that immediately precedes another vowel. There is no need in such cases to invoke the syllable. We have done so in analyzing CVN' sequences because the postulation of a single CVN' syllable greatly simplified the analysis—that is, because a general account was obtained that could be related to other phenomena within and beyond Ciyao (specifically to the maximal bimoraic condition on syllables).

(45) Some languages have vowel-shortening in a vocalic context

- a. VV → V / V__ (Gokana; [Hyman 1985])
 b. VV → V / __V (Kikamba; [Roberts-Kohno 1995])

The second concern we have is that some Bantu languages appear to have *mu-/N'*- allomorphy without having bimoraic syllables [Ngonyani 1993; Kadima 1969; Bell 1972]—but requires further attention. Since in these languages there is no V/VV opposition, and hence no bimoraic maximality, it would be difficult to formulate an argument that a CVN' sequence is one syllable. In order to be totally convinced of our argumentation, then, we would need to look more in

²⁴ Since our goal in this paper has been primarily to establish the contrasting types of prenasal nasal, we will not purpose other possible representations or implementations of OT here. We do note, returning to the derivation in (34), that a judicious use of underspecification might lead to the postulation of a single underlying representation for *mu-/N'*- prefixes such as following:

$$\left\{ \begin{array}{cc} \mu & \\ | & \\ [+nasal] & [+labial] \end{array} \right\}$$

Perhaps by establishing additional constraints such as Homorganic Nasal Assimilation >> Link [+labial] we could make the analysis seem more phonological and less allomorphic. Our initial attempts have however not led to any substantial improvement in the conceptualization or understanding of the phenomena under investigation.

detail as such languages to be sure that they do not require the same kind of analysis as in Ciyao.

These two reservations aside, the case for two types of moraic nasal in Ciyao is respectfully submitted.

REFERENCES

- Bell, Alan. 1972. "The development of syllabic nasals in the Bantu noun class prefixes *mu-*, *mi-* and *ma-*." *Anthropological Linguistics* 14:29-45.
- Bickmore, Lee. 1989. *Kinyambo Prosody*. Ph.D. dissertation, University of California, Los Angeles.
- Bickmore, Lee. 1991. "Compensatory lengthening in Kinyambo." In Francis Katamba (ed.), *Lacustrine Bantu phonology, Afrikanistische Arbeitspapiere* 25:75-103. Institut für Afrikanistik, University of Cologne.
- Cheng, Chin-Chuan and Charles W. Kisseberth. 1982. "Tone-bearing nasals in Makua." *Studies in the Linguistic Sciences* 12:123-139.
- Clements, George N. 1986. "Compensatory lengthening and consonant gemination in Luganda." In L. Wetzel and E. Sezer (eds.), *Studies in Compensatory Lengthening*, pp. 37-78. Dordrecht: Foris.
- Clements, George N. and Samuel Jay Keyser. 1983. *CV phonology*. Cambridge, MA: M.I.T. Press.
- Downing, Laura Jo. 1991. "The moraic representation of nasal-consonant clusters in Jita." In Francis Katamba (ed.), *Lacustrine Bantu phonology, Afrikanistische Arbeitspapiere* 25:105-130. Institut für Afrikanistik, University of Cologne.
- Givón, Talmy. 1974. "Rule un-ordering: generalization and de-generalization in phonology." In A. Bruck, R.A. Fox, and M. LaGaly (eds.), *Papers from the Parasession on Natural Phonology*, pp. 103-115. Chicago: Chicago Linguistic Society.
- Guthrie, Malcolm. 1967-1971. *Comparative Bantu*, Vols. 1-4. Farnborough, Hants: Gregg Press.

- Harries, Lyndon. 1950. *A Grammar of Mwera*. Johannesburg: University of Witwatersrand Press.
- Hayes, Bruce. 1989. "Compensatory lengthening in moraic phonology." *Linguistic Inquiry* 20:253-306.
- Herbert, Robert K. 1986. *Language Universals, Markedness Theory, and Natural Phonetic Processes*. Berlin: Mouton de Gruyter.
- Hubbard, Kathleen A. 1994. "Duration in moraic theory." Ph.D. dissertation, University of California, Berkeley.
- Hubbard, Kathleen A. 1995. "Morification and syllabification in Bantu languages." *Journal of African Languages and Linguistics* 16:137-155.
- Hubbard, Kathleen A. 1996. "'Prenasalized consonants and syllable timing: evidence from Runyambo and Luganda." *Phonology* 12:235-256.
- Hyman, Larry M. 1985. *A Theory of Phonological Weight*. Dordrecht: Foris.
- Hyman, Larry M. 1992. "Moraic Mismatches in Bantu." *Phonology* 9:255-265.
- Hyman, Larry M. and Francis X. Katamba. 1997. "The syllable in Luganda phonology and morphology." Submitted to Harry van der Hulst and Nancy Ritter (eds.), *The Syllable: Views and Facts*. Proceedings of the Conference on the Syllable in the Languages of the World. June 21-24, 1996. Pézénas, France.
- Hyman, Larry M. and Armindo Ngunga. 1994. "On the non-universality of tonal association 'conventions': Evidence from Ciyao." *Phonology* 11:25-68.
- Itô, Junko. 1989. "A prosodic theory of epenthesis." *Natural Language and Linguistic Theory* 7:217-259.
- Kadima, Marcel. 1969. "Le système des classes en bantou." Ph.D. dissertation, Catholic University of Leuven, Belgium.
- Kenstowicz, Michael and Charles Kisseberth. 1977. *Topics in Phonological Theory*. New York: Academic Press.
- Maddieson, Ian. 1993. "Splitting the mora." *UCLA Working Papers in Phonetics* 83:9-18.

- Mbaga, K., and W.H. Whiteley. 1961. "Formality and informality in Yao speech." *Africa* 31:135-146.
- Meeussen, A.E. 1967. *Bantu Grammatical Reconstructions*. Tervuren: Annales du Musée Royal de l'Afrique Centrale. Série 8, Sciences Humaines. No. 61:81-121.
- Mtenje, Al. 1990. "Verb Morphology and Tone Assignment in Ciyao." *Afrikanistische Arbeitspapiere* 28:41-59.
- Ngonyani, Deo. 1993. "Nasality and syllable structure in Kindendeule." Ms. University of California, Los Angeles.
- Ngunga, Armindo. 1995. "Phonological vs. phonetic vowel length in Ciyao." Paper presented at the Annual Meeting of the Linguistics Society of America, New Orleans.
- Odden, David. In press. "Principles of tone in Tanzanian Yao." In Larry M. Hyman and Charles Kisseberth (eds.), *Theoretical Aspects of Bantu Tone*.
- Odden, David. 1991. "VVNC in Kimatuumbi and Kikongo." *South African Journal of African Languages* 10:159-165.
- Odden, David. 1994. "The Origin of Leftward Tone Shift in Masasi Chiyao." *Berkeley Linguistics Society* 20, Special Session on Historical Issues in African Linguistics. Pp. 101-111.
- Odden, David. 1996. *The Phonology and Morphology of Kimatuumbi*. Oxford: Clarendon Press.
- Prince, A. and P. Smolensky. 1993. "Optimality theory: constraint interaction in generative grammar." Ms. Rutgers University and University of Colorado.
- Roberts-Kohno, R. Ruth. 1995. "Empty root nodes in Kikamba: conflicting evidence and theoretical implications." Paper presented at 26th Annual Conference on African Linguistics, University of California, Los Angeles.
- Shaw, Patrica A. 1993. "Templatic evidence for the syllable nucleus." In Amy J. Shafer (ed.), *Proceedings of the North East Linguistics Society* 23, pp. 463-477. Amherst: GLSA.
- Steriade, Donca. 1991. "Moras and other slots." *Formal Linguistics Society of Midamerica* 1:254-280.

Tucker, A. N. 1962. "The syllable in Luganda: a prosodic account." *Journal of African Languages* 1:122-166.

Zec, Draga. 1988. "Sonority constraints on prosodic structure." Ph.D. dissertation, Stanford University.

Zec, Draga. 1992. "Coda conditions and conditions on syllable weight." Ms. Cornell University.

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CLASS 5 ALLOMORPHY IN CIYAO

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Studies of Ciyao, a Bantu language classified as P.21 by Guthrie [1967-71], agree that there are 18 noun classes, each of which determines a primary prefix on the noun, and concord prefixes on elements that agree with head nouns. Most of the primary prefixes have the shape CV- or N- both in Proto-Bantu and in Ciyao. In contemporary Ciyao, class 5 nouns take a prefix which has two allomorphs, the expected CV- *di-* alternating with the isolated CVV- *dii-*, posing the problem of how to explain their source and distribution. The purpose of this paper is to document the realization of Ciyao class 5 in detail, and to demonstrate that the *di-/dii-* alternation is prosodically conditioned.

1. Introduction

One of the best known characteristics of the Bantu languages is the regular distribution of the nouns into noun classes. Ciyao, a Bantu language classified as P.21 by Guthrie [1967-71], provides a typical example.¹ Studies of Ciyao [Sanderson 1922, 1954; Whiteley 1961, 1966; Ngunga 1987] are unanimous in agreeing that there are 18 noun classes, each of which determines a primary prefix on the noun

¹ Ciyao is spoken in Malawi, Mozambique, Tanzania and, within the last forty years or so, in some regions of Zambia and Zimbabwe due to massive migration of thousands of Yaos from Malawi to those countries in the late 1940s and early 1950s. This paper is based on the Mozambican dialect as spoken by the author and Maria Bernardete. I would like to thank Larry Hyman for his extensive input into the writing of this paper as well as Sharon Inkelas and Sam Mchombo for their valuable comments on an earlier version. I would also like to thank Dete for insightful discussion of the data, as well as Thilo Schadeberg, Robert Botme, and an anonymous reviewer for their interesting comments on the earlier version. However, I remain solely responsible for any errors. Research on Ciyao has been supported in part by the Eduardo Mondlane University (Mozambique) and conducted in the context of the Comparative On-Line Dictionary (CBOLD) project, partially supported by National Science Foundation Grants #SBR93-19415 and #SBR96-16330.

Table 1. Ciyao noun classes

Class	Noun Prefix		Vb. AGR		Enum. AGR		Examples
	Ciyao	PB	Ciyao	PB	Ciyao	PB	
1	mu- mw- N'-	ju-mu- ²	ju-	ju-	ju-	(u-)	<i>muu-ndu jú-gwĩle</i> 'the person fell' <i>mw-aanáce jú-gwĩle</i> 'the child fell' <i>m-palú jú-gwĩle</i> 'the thief fell'
2	va- a-	ba-ba-	(v)a	ba-	va-	ba-	<i>vaa-ndu á-gwĩle</i> 'the people fell' <i>a-palú á-gwĩle</i> 'the thieves fell'
3	mu- mw- N'-	gu-mu-	wu-	gu-	wu-	(u-)	<i>mu-si wú-gwĩle</i> 'the village fell' <i>mw-éésí wú-gwĩle</i> 'the moon fell' <i>n-goómbá wu-gwĩle</i> 'the beam fell'
4	mi- my	gi-mi-	ji-	gi-	ji-	(i-?)	<i>mi-si jĩ-gwĩle</i> 'the villages fell' <i>mi-goómbá ji-gwĩle</i> 'the beams fell' <i>my-éésí jĩ-gwĩle</i> 'the moons fell'
5	di- dii- dy-	di-j-	di-	di-	di-	i-	<i>di-véélé dí-gwĩle</i> 'the breast fell' <i>dii-jela dí-gwĩle</i> 'the hoe fell' <i>dy-oolá di-gwĩle</i> 'the frog fell'
6	ma-	ga-ma-	ga-	ga-	ga-	ma-	<i>ma-véélé gá-gwĩle</i> 'the breasts fell' <i>ma-jela gá-gwĩle</i> 'the hoes fell'
7	ci- c-	ki-ki-	ci-	ki-	ci-	ki-	<i>ci-ló cí-gwĩle</i> 'the night fell' <i>c-áálá cí-gwĩle</i> 'the finger fell'
8	yi- y-	bi-bi-	yi-	bi-	yi-	bi-	<i>yi-ló yí-gwĩle</i> 'the nights fell' <i>y-áálá yí-gwĩle</i> 'the fingers fell'
9	N- ∅	ji-n-	ji-	ji-	ji-	(i-?)	<i>n-juva jĩ-gwĩle</i> 'the dove fell' <i>∅-wuuti jĩ-gwĩle</i> 'the gun fell'
10	N- ∅	ji-n-	si-	ji-	si-	i-	<i>m-balati sí-gwĩle</i> (sg.=11) 'the ribs fell' <i>n-gomó sí-gwĩle</i> (sg.=11) 'the lips fell' <i>n-juva sí-gwĩle</i> (sg.=9) 'the doves fell' <i>∅-wuuti sí-gwĩle</i> (sg.=9) 'the guns fell'
11	lu- lw-	du-du-	lu-	du-	lu-	du-	<i>lu-valati lú-gwĩle</i> 'the rib fell' <i>lu-wuudí lú-gwĩle</i> 'the white hair fell' <i>lw-aawú lu-gwĩle</i> 'the net fell'
12	ka-	ka-ka-	ka-	ka-	ka-	ka-	<i>ka-valati ká-gwĩle</i> 'the small rib fell'
13	tu-	tu-tu-	tu-	tu-	tu-	tu-	<i>tu-valati tú-gwĩle</i> 'the small ribs fell'
14	wu-	bu-bu-	wu-	bu-	wu-	bu-	<i>wu-lávidi wu-gwĩle</i> 'the flea fell'
15	ku-	ku-ku-	ku-	ku-	ku-	ku-	<i>ku-dyá kú-gwĩle</i> 'the eating fell'
16	pa-	pa-pa-	pa-	pa-	pa-	pa-	<i>pa-ntwé pá-gwĩle</i> 'the top of a head fell'
17	ku-	ku-ku-	ku-	ku-	ku-	ku-	<i>ku-ntwé kú-gwĩle</i> 'the head-rest fell'
18	mu- N'-	mu-mu-	mu-	mu-	mu-	mu-	<i>mu-ntwé mú-gwĩle</i> 'in the path is clean' <i>mw-iitala mu-saléele</i> 'in the path is clean'

² The first prefix in this column is the augment, a pronominal copy prefixed to noun prefixes having the structure CV-. In many contemporary Bantu languages, the initial C of the augment has been dropped, thereby creating a VCV- prefix sequence, as in the language names, I-ci-bemba, I-si-zulu, O-lu-ganda, where the initial vowels are augments and the CV- syllables are noun class prefixes. Abbreviations: vb=verb, enum.=enumerative, agr.=agreement.

as well as concord prefixes on elements that agree with head nouns. These noun classes are identified and illustrated in Table 1. Also presented in Table 1 are the Proto-Bantu (PB) forms for both noun and concord prefixes, as reconstructed by Meeussen [1967]. Most of these have the shape CV- or N- both in Proto-Bantu and in Ciyao. As one can see, however, class 5 nouns take a prefix which has two allomorphs in Ciyao: an expected CV- form *di-* alternating with the CVV- form *dii-*. The relation between these two allomorphs is the subject of the present study.

Our recent investigation of the Ciyao lexicon is based on a database of 7,714 entries of which there are 3,659 nouns. Of these, 515 are class 5 nouns, out of which 403 take the monomoraic prefix *di-*, while 112 take the bimoraic prefix *dii-*. The discovery of these two allomorphs poses the problem of how to explain the source and the distribution of the class 5 allomorphs in contemporary Ciyao. Having noticed the existence of the class 5 prefix *dii-* in many Bantu languages, Meeussen's [1967] diachronic account is that class 5 nouns were marked by a **di-_i*- sequence in Proto-Bantu, where **di-* is the so-called "augment" and *i-* the vowel prefix. However, as documented by Kadima [1969], numerous Bantu languages mark class 5 nouns with reflexes of *i-* rather than with reflexes of **di-*. Ciyao is one of the many Bantu languages that has lost the historical augment or "preprefix" (see de Blois [1970]). Thus, although it is likely that Ciyao *dii-* has its diachronic source in **di-_i*-, such an analysis is not available as a synchronic analysis.

The purpose of this paper is twofold. First, we propose to document the realization of Ciyao class 5 in considerable detail. Second, we shall demonstrate that the inherited system has been restructured in Ciyao in such a way that the *di-/dii-* alternation is now prosodically conditioned. The paper is organized as follows: §2 shows the prosodic conditioning of *di-/dii-* alternation. §3 discusses secondary prefixation, while §4 presents our conclusions.

2. Prosodically conditioned allomorphy

In this section we will demonstrate that the *di-/dii-* alternation is prosodically conditioned. As was mentioned earlier, Meeussen [1967] reconstructs the class 5 augment+prefix as **di-_i*-. Since Ciyao has lost the augment in all noun classes, class 5 should be realized currently as the reflex of **i-*. However, while most noun class prefixes are direct reflexes of the forms reconstructed for PB, neither of the two class 5 prefix allomorphs *di-/dii-* is a direct reflex of the historical prefix **i-*. The two forms *di-/dii-* suggest that class 5 is the only case where an augment has been retained in Ciyao. However, we shall show that bimoraic **di-_i*- has been restructured as a monomorphemic prefix, with the *dii-* allomorph being prosodically conditioned.

2.1. Monomoraic noun stems. As evident in Table 1, the class 5 prefix marks a singular noun. Nouns of this class are pluralized by affixing the class 6 *ma-*

prefix which is attached to the stem, as shown in (1).³ The noun stems in (1a) are trimoraic, while those in (1b) have more than three moras. Based on these data, we can safely conclude that polymoraic stems in class 5 take the monomoraic prefix *di-*.

(1) a. Trimoraic stems

Class 5		Class 6 (pl)
<i>di-wííwi</i>	'chicken'	<i>ma-wííwi</i>
<i>di-kúuga</i>	'group of people'	<i>ma-kúuga</i>
<i>di-véélé</i>	'breast'	<i>ma-véélé</i>
<i>di-sejele</i>	'bead apron'	<i>ma-sejele</i>
<i>di-lámúsí</i>	'order'	<i>ma-lámúsí</i>

b. Longer stems

<i>di-saamulo</i>	'comb'	<i>ma-saamulo</i>
<i>di-pálásila</i>	'float'	<i>ma-pálásila</i>
<i>di-comeela</i>	'game-pit'	<i>ma-comeela</i>
<i>di-jóngóólo</i>	'centipede'	<i>ma-jóngóólo</i>
<i>di-palapaato</i>	'scraping'	<i>ma-palapaato</i>
<i>di-púlúpúútwá</i>	'butterfly'	<i>ma-púlúpúútwá</i>
<i>di-piikanilo</i>	'ear'	<i>ma-piikanilo</i>
<i>di-váándámá</i>	'spleen'	<i>ma-váándámá</i>
<i>di-puundúgulú</i>	'cloud'	<i>ma-puundúgulú</i>
<i>di-púúluulu</i>	'bush'	<i>ma-púúluulu</i>
<i>di-sókódikóko</i>	'husk of rice'	<i>ma-sókódikóko</i>
<i>di-pweeteceela</i>	'tomato'	<i>ma-pweeteceela</i>

³ Class 6 can, under certain circumstances, be used to mark the plural form of nouns which belong to different classes in order to indicate collectivity. These nouns may or may not have other plural forms. In still other cases, *ma-* may be attached to nouns which do not have singular forms. It appears that nouns which accept the plural prefix *ma-* sometimes allow backformation to derive a class 5 singular form marked by one of the allomorphs *di-* or *dii-* as in the following examples:

- | | | | | |
|-------------------------------|---|------------------------------|---|-----------------------------------|
| a) nyúumba (9/10) | → | ma-juúmba (6) | → | di-juúmba (5) |
| 'house/s' | | 'many houses (collective)' | | 'very big house' |
| b) — | → | ma-míla | → | dii-míla (5) |
| | | 'nasal mucus' | | 'very dense nasal mucus' |
| c) lu-soóngá (11/10) | → | ma-soóngá (6) | → | di-soóngá (5) |
| 'pointed stick' | | 'many pointed sticks' | | 'big pointed stick' |
| d) wu-gadí (14) | → | ma-gadí (6) | → | dii-gadí (5) |
| 'stiff porridge' | | 'types of stiff porridge' | | 'huge amount of stiff ...' |
| e) ci-pyá (7) | → | yi-pyá (8) | → | dii-pyá (5) |
| 'debris/ashes from bush-fire' | | 'debris/ashes from bushfire' | | 'huge amount of 'debris/ashes...' |

Observe that the class 5 nouns which result from backformation convey a special meaning (augmentative). We shall see that even in such cases, the *di-/dii-* alternation is prosodically conditioned, i.e., di+CVCV nouns derived by backformation, show the same lengthening opposition.

Now consider the nouns in (2), whose stems are monomoraic. Differing from the nouns in (1), where we saw that polymoraic stems take the monomoraic class 5 prefix *di-*, the monomoraic stems in (2) select the bimoraic prefix *dii-*. We see here the first indication that the *di-/dii-* alternation is prosodically conditioned.

(2) -CV stems

Singular (cl. 5)		Plural (cl. 6)	
<i>dii-pé</i>	‘spear grass’	<i>ma-dii-pé</i>	* <i>ma-pé</i>
<i>dii-sí</i>	‘side of a river’	<i>ma-dii-sí</i>	* <i>ma-sí</i>
<i>dii-wú</i>	‘ashes’	<i>ma-dii-wú</i>	* <i>ma-wú</i>

In addition, we note that the plural of the nouns in (2) is derived by “preprefixing” the plural marker to the singular prefix. At least two hypotheses might be entertained to explain this fact. First, one might hypothesize that plural prefixes cannot be directly attached to monomoraic stems. However, the data in (3), where the singular nouns belong to classes other than class 5, show that this hypothesis cannot be maintained. Note that there are very few -CV stems; in classes 1/2, for example, there are none at all.

(3) -CV stem (other than class 5)

Singular		Plural	
<i>mu-sí</i> (3)	‘village’	<i>mi-sí</i> (4)	* <i>mi-mu-si</i>
<i>ci-pi</i> (7)	‘darkness’	<i>yi-pi</i> (8)	* <i>yi-ci-pi</i>
<i>ci-pó</i> (7)	‘pimple (on the face)’	<i>yi-pó</i> (8)	* <i>yi-ci-pó</i>

As is evident from these examples, even though the stems are monomoraic, the plural form of the nouns in (3) is obtained by affixing the plural prefix directly to the stem. This process is schematized in (4).

- (4) a. [-si]_{sg} → mu-si
 b. [-si]_{pl} → mi-si
 c. [[-si]_{sg}]_{pl} → *mi-mu-si

We see in (4a-b) what can be regarded as an unmarked relationship between singular and plural forms in Ciyao. Illustrated via classes 3/4, singular *mu-* and plural *mi-* are directly spelled out on the noun stems carrying the features [sg] and [pl], respectively. Thus, the general (unmarked) situation is where both the singular and the plural prefixes are attached directly to the stem. It thus cannot be the monomoraicity of their stems *per se* that prevents the examples in (2) from deriving the plural forms by attaching the plural marker directly to the stems. We therefore reject the first hypothesis.

The second hypothesis to account for the double prefixation in (2) refers to the specific identity of the class 6 plural prefix. Perhaps *ma-* cannot be affixed to monomoraic stems in general, i.e., independently of the class 5 singular problem. According to this hypothesis, the presence of *dii-* in the plurals in (2) would be due to a minimality condition that *ma-* requires at least two moras following it. The data in (5) provide a test of this hypothesis.

- (5) a. *ma-nyí* (6) 'excrement'
 ma-tá (6) 'saliva'
- b. *ma-wu-pyá* 'wild fires' < *wu-pyá* (14) (**ma-pyá*)
 ma-wu-syó 'foreheads' < *wu-syó* (14) (**ma-syó*)

The nouns in (5a) are the only two class 6 nouns with monomoraic stems found in the database that do not have singular counterparts.⁴ As shown, the class 6 prefix *ma-* is attached directly to these stems. If there were a pervasive constraint that *ma-* must be followed by at least two moras, we might have expected either the repetition of the prefix (**ma-ma-nyí*) or reduplication of the stem (**ma-nyinyí*) to meet the minimal size requirement. While this may suggest that the "preprefixation" of plural *ma-* to the singular nouns in (2) is not a property of the class 6 prefix, the examples in (5b) tell a different story. The nouns in (5b) are the only two class 6 nouns with a monomoraic stem derived from a singular other than class 5—in this case class 14. As indicated, *ma-* may not be attached directly to the monomoraic stem, but rather must occur outside the singular prefix *wu-* (cl.14). Comparing the examples in (5) with those in (2), we arrive at the following generalization: a derived plural in class 6 requires that *ma-* be followed by at least two moras. So, what we have in (2) and (5b) can be represented as in (6), below.

- (6) a. [-pé]_{sg} → dii-pé b. [-pé]_{pl} → *ma-pé
 [-pyá]_{sg} → wu-pyá [-pyá]_{pl} → *ma-pyá
- c. [[-pé]_{sg}]_{pl} → dii-pé → ma-dii-pé d. [-nyí]_{pl} → ma-nyí
 [[pyá]_{sg}]_{pl} → wu-pyá → ma-wu-pyá [-tá]_{pl} → ma-tá

In (6a) we see that the singular prefixes *dii-* and *wu-* can be spelled out directly onto a stem which is marked [sg]. In (6b), however, we see that one cannot derive the class 6 plurals directly from a stem marked [pl]. Instead, as shown in (6c), the singular is first spelled out with *dii-* and *wu-*, based on the

⁴ This database was originally extracted from Sanderson [1954], which I marked for vowel length and tone, revised, added words to, and entered into Filemaker Pro™ with additional fields for noun classes, perfective verb stems, etc. At the time of the writing of this paper, the resulting Ciyao dictionary consists of 7,714 entries, of which 3,659 are nouns. I would like to thank John Lowe, without whose help this effort could not have been realized.

stem feature [sg]. This singular then serves as input to the spelling out of the [pl] feature as *ma-*. This “spell-out” rule does not apply to “inherent” (i.e., non-derived) prefixes such as the two inherent class 6 nouns in (6d), which have no corresponding singulars. The plural of these, as illustrated in (6d), are derived directly from the stem, as we proposed in (4) for both singular and plural classes other than class 6.⁵

Returning to the class 5 prefix, it is important to note that *di-/dii-* allomorphy is an exclusive property of class 5 nouns and not of other syntactic categories which take class 5 concord. That is, there is no *di-/dii-* alternation when the class 5 prefix is attached to demonstratives, verbs, or other parts of speech, even when the following stem is monosyllabic, as illustrated in (7).

(7) a. Demonstratives

dí-vaatá di-la ‘that duck’ (cf. **dii-la*)
5-duck 5-that

di-saamulo dí-la ‘that comb’ (cf. **dii-la*)
5-comb 5-that

b. Adjectives

di-wiiwí dyá dí-wé ‘dead chicken’ (cf. **díí-wé*)
5-chicken 5.that 5-dead

di-vaatá dyá dí-pyé ‘burnt duck’ (cf. **díí-pyé*)
5-duck 5.that 5-dead

c. Numerals

di-vaatá di-mo ‘one duck’ (cf. **dii-mo*)
5-duck 5-one

dii-saamulo dí-mo ‘one comb’ (cf. **dii-mo*)
5-comb 5-one

d. Subject marker (SM)

di-wiiwí cí-dí-dye ‘the chicken will eat’ (cf. **dii-dye*)
5-chicken FUT-5-eat

di-saamulo cí-dí-pye ‘the comb will burn’ (cf. **dii-pye*)
5-comb FUT-5-burn

⁵ There are, of course, other ways to derive this effect, including non-derivational ones. Larry Hyman (pers. comm.) has thus suggested that these facts could be nicely handled by invoking the “correspondence theory” of OT (McCarthy and Prince [1995]: There is a (violable) bimoraic stem constraint requiring class 6 *ma-* to be followed by at least two moras. When a stem is monomoraic, this constraint is satisfied by invoking the corresponding singular. Where there is no corresponding singular, such correspondence, of course, cannot be invoked, and the result is a violation of the bimoraic stem constraint.

e. Object marker (OM)

cí-tú-di-pé *di-wííwi* ‘we will give the chicken’ (cf. **cí-tú-dii-pé*)
 FUT-we-5-give 5-chicken

cí-tú-di-dyé *ǀi-vaáta* ‘we will eat the duck’ (cf. **cí-tú-dii-dyé*)
 FUT-we-5-eat 5-duck

In (7) the class 5 prefix, in boldface, is attached to the monomoraic stems of a demonstrative (7a), an adjective (7b), and a numeral (7c). In (7d) and (7e), the class 5 prefix appears on verbs, as subject marker and object marker, respectively. As one can see, *di-* is the only allomorph allowed in spite of the size of the stems.⁶ Thus, there is something very specific about the class 5 prefix *dii-* that occurs exclusively before monomoraic noun stems.

This having been said, we should note that there is one context—reduplication—in which the final vowel of all demonstratives is lengthened, in which case the extra mora functions as a “bridge” between the base and the reduplicant, as in (8).

- (8) *a-vá-á-vá* ‘these very X (cl.2)’
a-ǀí-í-ǀí ‘this very Y (cl.5)’
a-mú-ú-mú ‘in this very Z (cl. 18)’

The capital letters X, Y, Z, in (8) stand for any nouns belonging to classes 2, 5, and 18, respectively. Thus, the length of the final vowel of the base cannot be regarded as a property of class 5, since it occurs with all prefixes in this context.

For comparison, we present the corresponding plurals of the forms in (7), with the exception of numerals, in (9).

(9) a. Demonstratives

ma-vaatá ga-la ‘those ducks’ (cf. **ga-dii-la*)
 6-duck 6-DEM

ma-saamulo gá-la ‘those combs’ (cf. **ga-dii-la*)
 6-comb 6-DEM

⁶ Note that a bimoraic *dii-* may appear in the verb complex as a reflexive marker. This reflexive *-dii-*, which should not be confused with the class 5 allomorph *-dii-*, is the same for all nouns regardless of class, as illustrated in the following examples:

- (a) *mw-aadǀ ju-kú-ǀǀi-totela deléesi* ‘the girl (cl.1) has sewn herself a dress’
 (b) *n-cǀimbo wu-ǀǀi-kámwǀile nciwǀunu* ‘the old baboon (cl.3) has grabbed itself on the hips’
 (c) *dii-janǀ ǀi-kú-ǀǀi-páka wútope* ‘the baboon (cl.5) is smearing itself with mud’
 (d) *c-oomé cí-ǀǀi-potéecé* ‘the cat (cl.7) has hurt/injured itself’

As shown, reflexive *-ǀǀi-* is realized as such regardless of the number of moras following it in the verb stem. Interestingly, Hyman and Ngunga [1994] present a tonal argument in favor of representing the reflexive as bipartite: *-ǀi-i-*.

b. Adjectives

ma-wiiwí gá gá-wé ‘dead chickens’ (cf. **gá-díí-wé*)
 6-chicken 6.that 6-dead

ma-vaatá gá gá-pyé ‘burnt ducks’ (cf. **gá-díí-pyé*)
 6-duck 6.that 6-dead

c. Subject marker

ma-wiiwí cí-gá-dye ‘the chickens will eat’ (cf. **ga-dii-dye*)
 6-chicken FUT-6-eat

ma-saamulo cí-gá-pye ‘the combs will burn’ (cf. **ga-dii-pyé*)
 6-comb FUT-6-burn

d. Object marker

cí-tú-ga-pé má-wííwi ‘we will give the chickens’ (cf. **cí-tú-ga-dii-pé*)
 FUT-we-6-give 6-chicken

cí-tú-ga-dyé má-vaáta ‘we will eat the ducks’ (cf. **cí-tú-ga-dii-dyé*)
 FUT-we-6-eat 6-duck

The agreement marker of class 6 nouns is *ga-* and not *ma-*. As can be seen in (9), *ga-* is attached directly to the monomoraic stems of demonstratives, verbs, and adjectives. That is, it does not require the presence of the class 5 singular marker as is the case of class 6 plural nouns with monosyllabic stems. If this had been the case, the incorrect starred forms in parentheses would have been derived. Another important point to note is that, although adjectives might be expected to have the same prefixal morphology as nouns, the examples in (9a-b) show that adjectival inflection is essentially the same as demonstrative inflection (e.g., *ju-* not *mu-*, and *ga-* not *ma-*, in classes 1 and 6, respectively).

2.2. Bimoraic noun stems. To summarize thus far, the allomorph *dii-* is used before class 5 monomoraic noun stems. In addition, *dii-* is present in the corresponding class 6 plurals, because plural *ma-* requires that at least two moras follow. This effect of monomoraic stems is not present in other parts of speech (demonstratives, adjectives, numerals, verbs), which take exclusively the allomorph *di-*, as do noun stems having three or more moras.

Thus far nothing has been said about bimoraic noun stems. As shown in (10), these also take the allomorph *dii-* in class 5. In (10a) we see that *dii-* is not retained in the corresponding plurals. Instead, the prefix *ma-* is attached directly to the stem since the latter has the requisite two moras. A similar situation is seen in (10b), where the prefix *wu-* of class 14 nouns also drops when the class 6 plural prefix *ma-* is affixed.

(10) -CVCV stems

a. Class 5		Class 6 (pl.)
<i>dii-tivi</i>	‘valley’	<i>ma-tivi</i>
<i>dii-túnu</i>	‘hyena’	<i>ma-túnu</i>
<i>dii-jela</i>	‘hoe’	<i>ma-jela</i>
<i>dii-jóká</i>	‘snake’	<i>ma-jóká</i>
<i>dii-janí</i>	‘baboon’	<i>ma-janí</i>
b. Class 14		Class 6 (pl.)
<i>wu-gadi</i>	‘stiff porridge’	<i>ma-gadii</i>
<i>wu-vígó</i>	‘game-fence’	<i>ma-vígó</i>
<i>wu-tope</i>	‘mud’	<i>ma-tope</i>
<i>wu-nyólo</i>	‘metal chain’	<i>ma-nyólo</i>
<i>wu-kuní</i>	‘bird's tail’	<i>ma-kuní</i>

These data, along with those in (1) and (2), provide us with evidence that the *di-/dii-* alternation is conditioned by the number of moras in the stem. That is, as we saw in (1), if the stem has more than two moras, the class 5 prefix is monomoraic. But if, on the other hand, the stem is at most bimoraic, as in (2) and (10), the class 5 prefix is bimoraic. As for the plural forms, it was mentioned above that *ma-* cannot derive plural nouns (from singular) by its direct prefixation to the monomoraic stems, in which case the prefix *ma-* is prefixed to the *dii-CV* and *wu-CV* nouns in (2) and (5), respectively. The plural forms of the nouns in (10) do not keep their singular marker because their stems satisfy the minimality requirement the input must satisfy before they are pluralized: bimoraic stem.

While it is largely true that the *di-/dii-* alternation is prosodically conditioned, there is one exceptional case of a -CVCVVNCV stem which inexplicably takes the bimoraic prefix *dii-*, as shown in (11).

(11) -CVCVVNCV stem

Class 5		Class 6 (pl.)
<i>dii-pujuungu</i>	‘vapor, steam, hot air’	<i>ma-pujuungu</i>

This is the only such case out of 112 class 5 nouns which takes a bimoraic prefix. In the plural form, the bimoraic singular prefix is “replaced” by a monomoraic *ma-* as in all other cases where the class 5 noun prefix is at least bimoraic.⁷

⁷ Thilo Schadeberg (per. comm.) suggested to me that the length of the class 5 prefix in *dii-pujuungu* “would be explained if it were a compound: *dii-pu-juungu*”, although *-pu-* does not exist as a noun stem in the language. This proposal is an interesting one for it implies that the lengthening of the class 5 prefix sees the internal structure of the compound. However, although it seems to work for this

2.3. NC-initial stems. For the sake of completeness, let us consider a very different source of prefix length, NC-stems, illustrated by the examples in (12).

(12) -NC...stems

a. Class 5		Class 6 (pl.)
<i>dii-mbáciiga</i>	‘swollen gland’	<i>maa-mbáciiga</i>
<i>dii-mbanaanga</i>	‘splendor’	<i>maa-mbanaanga</i>
<i>dii-ngáanje</i>	‘rind of corn-stalk’	<i>maa-ngáanje</i>
<i>dii-ngóleenga</i>	‘trace of liquid on body’	<i>maa-ngóleenga</i>
<i>dii-njauwule</i>	‘kind of dance’	<i>maa-njauwule</i>
b. Other classes		
<i>muu-ndálaanga</i>	(3) ‘kind of dance’	
<i>mii-ngúti</i>	(4) ‘kind of tree’	
<i>cii-ndógoodya</i>	(7) ‘fruit of a rubaceous tree’	
<i>yii-ndógoodya</i>	(8) ‘fruits of a rubaceous tree’	
<i>luu-ngumbisi</i>	(11) ‘poor sight’	
<i>muu-ngokwe</i>	(18) ‘in the granary’	

Since the stems of the examples in (12a) are polymoraic, the *dii-* allomorph is unexpected. However, these nouns share the property of having a homorganic nasal+consonant (NC) sequence in stem-initial position. In many Bantu languages, including Ciyao, homorganic nasals condition preceding vowel length by a process of compensatory lengthening [Clements 1986, Hayes 1989, Hubbard 1993, 1994, 1995, Hyman and Katamba 1997, Maddieson 1993, Maddieson and Ladefoged 1993], further illustrated by the examples in (12b). Here, then, the vowel length in the prefixes in (12) is conditioned by the nature of the following segment. That is, *dii-* in (12a) derives from /di-/ when the latter is followed by a moraic nasal (Hyman and Ngunga 1997 [this issue]).

Other evidence for this is the fact that the vowel of the plural prefix *ma-* is also lengthened in this position. As we saw previously, prefix length conditioned by the mora count of the noun stem is an exclusive feature of the class 5 prefix, other prefixes remaining monomoraic. However, in (12a) we have *maa-* (cl.6), and in (12b) *muu-* (cl.3, 18), *mii-* (cl. 4), *cii-* (cl.7), *yii-* (cl.8), and *luu-* (cl.11),

particular case, other examples in which we find actual compounding do not support it. Consider the following examples:

- a. *di-wú má ámbula* (< -wú má + mbula) ‘bleed at noses’
 b. *di-ká lá ángulo* (< -ká lá + ngulo) ‘sore throat’

In these examples we have clear cases of compounds where the stem of the first member has the structure -CVCV. The fact that the prefixes of these compound nouns fail to lengthen tells us that unlike Schadeberg’s suggestion, the process treats compounds like underived nouns with polysyllabic stems, and does not care about their internal structure.

which suggests that vowel length in all the examples in (12) is conditioned by the same environmental factor, the initial NC sequence of the stem.

With other noun stems, however, prefix lengthening fails to apply, even though the phonological environment is similar to that observed in (12). As in (12), the prefix precedes a stem-initial NC sequence, yet the prefix vowel does not lengthen as it does in the examples in (12).

(13)	Singular		Plural
	a. -NCVVCV stem		
	(cl.5)		(cl.6)
	<i>di-mbaala</i>	‘gruel’	<i>ma-mbaala</i>
	<i>di-mboonda</i>	‘edible gourd’	<i>ma-mboonda</i>
	<i>di-ndoóndwa</i>	‘drop’	<i>ma-ndoóndwa</i>
	<i>di-nduútu</i>	‘popped corn’	<i>ma-nduútu</i>
	<i>di-ngoole</i>	‘coconut’	<i>ma-ngoole</i>
	<i>di-ngwíita</i>	‘bracelet or anklet’	<i>ma-ngwíita</i>
	<i>di-mbooko</i>	‘ophthalmia’	<i>ma-mbooko</i>
	b. -NCV... stem		
	(cl.7)		(cl.8)
	<i>ci-mbádi</i>	‘unjustified expectation’	<i>yi-mbádi</i>
	<i>ci-mbandíingwa</i>	‘piece of broken gourd’	<i>yi-mbandíingwa</i>
	<i>ci-ngelengeele</i>	‘bell’	<i>yi-ngelengeele</i>
	(cl.12)		(cl.13)
	<i>ka-ndúndúdimya</i>	‘hillock’	<i>tu-ndúndúdimya</i>

One factor inhibiting lengthening of the prefix vowel appears to be the presence of a long vowel in the stem-initial syllable, as suggested by the examples in (13a). While we cannot predict with complete certainty which initial NC sequences will condition lengthening of the prefix vowel, with very few exceptions, the existence of a long vowel in the initial syllable of the stem precludes lengthening of the prefix vowel (Ngunga 1995).⁸

In (13b) we have nouns from other classes with homorganic nasal sequences in stem-initial position and short vowel in the first syllable. Even though all the conditions are apparently met for compensatory lengthening to apply to the prefix vowel, it does not. This failure of compensatory lengthening to apply reveals that what we actually have in stem-initial position in (12) and (13) are two different

⁸ From this point of view, the noun *dii-ngáanje* (pl.: *maa-ngáanje*) ‘rind of corn stalk’ (12a), which has all the characteristics of the nouns in (13a) except that it takes a bimoraic prefix, is an exceptional case in having a moraic nasal followed by a long vowel in the next syllable.

kinds of preconsonantal nasals in Ciyao. As argued by Hyman and Ngunga [1997 (this issue)], nouns such as those in (12) have *moraic* preconsonantal nasals in stem-initial position which give up their moras in favor of the prefix vowel, allowing it to lengthen. In (13) the stem-initial preconsonantal nasals are non-moraic and therefore do not trigger the lengthening of the prefix vowel. In the following table we provide the statistics of the class 5 nouns with preconsonantal nasals in stem-initial position.

Table 2. Statistical account of the distribution of class 5 allomorphs before NC-initial stems.

Class 5 Allomorphs	Noun stem shapes		Total
	-NCVV(N)CV	-NCVVCV(N)CV	
<i>di-</i>	18	—	18
<i>dii-</i>	1	5	6
Total	19	5	24

Table 2 shows that the distribution of *di-/dii-* before NC-initial stems is conditioned by the length of the stem-initial syllable. That is, if the stem-initial syllable is long (e.g., -NCVV...), the vowel of the prefix is short (*di-*), but if the stem-initial syllable is short (-NCVC...), the vowel of the prefix is long (*dii-*). Out of the 19 class 5 nouns with -NCVV...-initial stems, eighteen select the short class 5 allomorph *di-* and, exceptionally, one selects the long class 5 allomorph *dii-*. In contrast, all of the five nouns with -NCVC... in stem-initial position select long class 5 allomorph (*dii-*). Thus, Table 2 demonstrates that, just as in the cases previously discussed, before -NC-initial stems, the length of the class 5 prefix vowel is highly predictable. In the next section we discuss the affixation of class 5 allomorphs before vowel-initial stems.

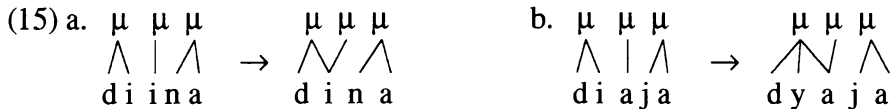
2.4. -VCV stems. Let us consider class 5 nouns that have -VCV stems, as illustrated in (14). The nouns in (14a) have a high front vowel in stem-initial position; those in (14b) begin with a non-front vowel. The last two nouns in (14b) have no plural forms and were included here for the sake of exhaustiveness. It should be pointed out that there are no non-derived vowel-initial stems longer than those given in (14).

Since the stems of the class 5 nouns in (14) are bimoraic, their class 5 prefix should in principle be *dii-*. However, it is not possible to test this hypothesis, since a trimoraic combination of /dii+V/ would in any case have to be pared down to conform with the bimoraic maximum on Ciyao syllables. It should also be pointed out that the /i/ of the prefix glides to [y] before vowels other than /i/.

(14) -VCV stems

Singular		Plural	
a.	<i>dí-íná</i>	'name'	<i>mééná</i> (< /ma+ina/)
	<i>dí-ínó</i>	'tooth'	<i>méénó</i> (< /ma+ino/)
	<i>dí-ísó</i>	'eye'	<i>méésó</i> (< /ma+iso/)
Singular		Plural	
b.	<i>dy-aája</i>	(< /di-ája/)	'African breadfruit' <i>ma-ája</i> (< /ma-ája/)
	<i>dy-oóla</i>	(< /di-óla/)	'frog' <i>m-oóla</i> (< /ma-óla/)
	<i>dy-uúngu</i>	(< /di-úngu/)	'pumpkin' <i>m-oóngu</i> (< /ma-úngu/)
	<i>dy-úúvá</i>	(< /di-úvá/)	'sun, day' <i>m-óová</i> (< /ma-úvá/)
	<i>dy-óósí</i>	(< /di-ósí/)	'smoke'
	<i>dy-óogo</i>	(< /di-ogo/)	'first bath after circumcision'

In (15) we see how the forms in (14) are derived. We begin in both (15a) and (15b) with sequences of *di-* followed by a -VCV stem. Had we begun with *dii-*, we would most likely have lost one of the two moras of the prefix when it is followed by a vowel-initial stem. In (15a) the /i/ of *di-* joins the initial /i/ of the stem /-ina/ to form a bimoraic syllable [dii]. In (15b) the vowel /i/ of the prefix glides to [y] and the following non-high front vowel is compensatorily lengthened. The result is a bimoraic syllable [dyaa].



In the case of the corresponding singular forms, the /a/ of *ma-* fuses with the initial /i/ of the nouns stems in (14a), while it deletes before other vowels in (14b). What is important for our understanding of the problem at hand is that *ma-* is not added to fused class 5 prefixes to form the plural. That is, we do not obtain **ma-dí-íná*, **ma-dy-áaja*, etc.

The discussion developed so far can be summarized as follows. The class 5 prefix in Ciyao has two allomorphs, *di-* and *dii-*, whose distribution is determined by the number of moras in the stem. With the exception reported in (11), no stem with more than two moras selects the bimoraic prefix, although this and other prefixes may acquire a long vowel if followed by a moraic nasal. In order to further test the proposed prosodic conditioning of *dii-*, we consider secondary prefixation in the next section.

3. Secondary prefixation

In this section we examine the so-called secondary prefixation which refers to the processes of diminutivization and locativization.

3.1. Diminutivization of class 5 nouns. The singular class 12 prefix (*ka-*) and its corresponding plural class 13 prefix (*tu-*) are diminutivizers in Ciyao. In general these prefixes occur in the place of the inherent noun class prefix of the input (non-diminutive) noun. This process can be transparently observed in (16), where there are polymoraic -CVVCV stems in (16a), longer stems in (16b). The diminutive prefixes are attached directly to the noun stems, “replacing” the inherent singular and plural prefixes.

(16) Class 5		Class 12 (sg.)	Class 13 (pl.)
a. Trimoraic stems			
<i>di-wííwi</i>	‘chicken’	<i>ka-wííwi</i>	<i>tu-wííwi</i>
<i>di-kúuga</i>	‘group of people’	<i>ka-kúuga</i>	<i>tu-kúuga</i>
<i>di-sejele</i>	‘bead apron’	<i>ka-sejele</i>	<i>tu-sejele</i>
<i>di-lámúsí</i>	‘order’	<i>ka-lámúsí</i>	<i>tu-lámúsí</i>
b. Longer stems			
<i>di-saamulo</i>	‘comb’	<i>ka-saamulo</i>	<i>tu-saamulo</i>
<i>di-pálásila</i>	‘float’	<i>ka-pálásila</i>	<i>tu-pálásila</i>
<i>di-piikanilo</i>	‘ear’	<i>ka-piikanilo</i>	<i>tu-piikanilo</i>
<i>di-puundúgulú</i>	‘cloud’	<i>ka-puundúgulú</i>	<i>tu-puundúgulú</i>
<i>di-sókódikóko</i>	‘husk of rice’	<i>ka-sókódikóko</i>	<i>tu-sókódikóko</i>
<i>di-pweeteceela</i>	‘tomato’	<i>ka-pweeteceela</i>	<i>tu-pweeteceela</i>

Examples of diminutivization of class 5 nouns whose stems have a preconsonantal nasal in initial position are given in (17). As in (16), the diminutive prefixes in (17) are also attached directly to the noun stem. Compensatory lengthening yields *kaa-/tuu-* forms of the diminutive prefixes (17a) where the noun stems begin with moraic nasal. In (17b) the rule does not apply, since the preconsonantal nasal of these stems is non-moraic.

(17) -NC initial stems		Class 12 (sg.)	Class 13 (pl.)
Class 5			
a. <i>dii-mbáciiga</i>	‘swollen gland’	<i>kaa-mbáciiga</i>	<i>tuu-mbáciiga</i>
<i>dii-mbanaanga</i>	‘splendor’	<i>kaa-mbanaanga</i>	<i>tuu-mbanaanga</i>
<i>dii-ngáanje</i>	‘rind of corn-stalk’	<i>kaa-ngáanje</i>	<i>tuu-ngáanje</i>
<i>dii-ngóleenga</i>	‘trace of liquid on the body’	<i>kaa-ngóleenga</i>	<i>tuu-ngóleenga</i>
<i>dii-njawuule</i>	‘kind of dance’	<i>kaa-njawuule</i>	<i>tuu-njawuule</i>

Class 5		Class 12 (sg.)	Class 13 (pl.)
b. <i>di-ngwíita</i>	‘bracelet’	<i>ka-ngwíita</i>	<i>tu-ngwíita</i>
<i>di-mbaala</i>	‘gruel’	<i>ka-mbaala</i>	<i>tu-mbaala</i>
<i>di-mboonda</i>	‘edible gourd’	<i>ka-mboonda</i>	<i>tu-mboonda</i>
<i>di-ndoóndwa</i>	‘drop’	<i>ka-ndoóndwa</i>	<i>tu-ndoóndwa</i>
<i>di-nduútu</i>	‘popped corn’	<i>ka-nduútu</i>	<i>tu-nduútu</i>
<i>di-ngoole</i>	‘coconut’	<i>ka-ngoole</i>	<i>tu-ngoole</i>
<i>di-mbooko</i>	‘ophthalmia’	<i>ka-mbooko</i>	<i>tu-mbooko</i>

Now contrast the above situation with the examples in (18). Even though the prefixes of the nouns in (18) are bimoraic, their corresponding diminutive is realized in the same manner as observed in (16) and (17b), where *ka-* (singular) and *tu-* (plural) occur in the place of the classes 5 and 6 primary prefixes, respectively. Once again it is only the class 5 prefix that shows prosodic conditioning of a long vowel allomorph.

(18) Class 5		Class 12 (sg.)	Class 13 (pl.)
a. -CVCV stems			
<i>dii-tivi</i>	‘valley’	<i>ka-tivi</i>	<i>tu-tivi</i>
<i>dii-jóká</i>	‘snake’	<i>ka-jóká</i>	<i>tu-jóká</i>
<i>dii-túnu</i>	‘hyena’	<i>ma-túnu</i>	<i>tu-túnu</i>
<i>dii-jela</i>	‘hoe’	<i>ma-jela</i>	<i>tu-jela</i>
<i>dii-janí</i>	‘baboon’	<i>ma-janí</i>	<i>tu-janí</i>
b. -CVCVVNCV stem			
<i>dii-pujuungu</i>	‘vapor, hot air’	<i>ka-pujuungu</i>	<i>tu-pujuungu</i>

Now consider the forms in (19), in which nouns having stem-initial vowels diminutivize by adding the diminutive prefix outside the inherent prefix.⁹ It is important to observe that in the plural forms there are two ways to express diminutivization, both accepted by the native speakers.

(19) Cl.5 (sg.)		Cl.12 (sg.)	Cl.13 (pl.)	Cl.13 (pl.) (alternative)
-VCV stems				
<i>dí-íná</i>	‘name’	<i>ka-dí-íná</i>	<i>tu-dí-íná</i>	<i>tu-mééná</i>
<i>dí-ínó</i>	‘tooth’	<i>ka-dí-ínó</i>	<i>tu-dí-ínó</i>	<i>tu-méénó</i>
<i>dí-ísó</i>	‘eye’	<i>ka-dí-ísó</i>	<i>tu-dí-ísó</i>	<i>tu-méénó</i>
<i>dy-áaja</i>	‘African breadfruit’	<i>ka-dy-aája</i>	<i>tu-dy-aája</i>	<i>tu-máaja</i>
<i>dy-oóla</i>	‘frog’	<i>ka-dy-oóla</i>	<i>tu-dy-oóla</i>	<i>tu-moóla</i>
<i>dy-uúngu</i>	‘pumpkin’	<i>ka-dy-uúngu</i>	<i>tu-dy-uúngu</i>	<i>tu-moóngu</i>
<i>dy-úúvá</i>	‘sun, day’	<i>ka-dy-úúvá</i>	<i>tu-dy-úúvá</i>	<i>tu-móová</i>

⁹ This differs from the behavior of *ma-*, which, as was seen in (14), cannot be added before a fused class 5 prefix, e.g., **ma-dí-íná*, **ma-dy-áaja*, etc.

For the purpose of comparison, see in (20) the diminutivization of nouns having vowel-initial stems but not belonging to class 5. The stems of the nouns in (20a) have the shape -CVCV or longer. The prefixes of these nouns are not replaced by the diminutive prefixes. In contrast, in (20b) the prefixes of the nouns with vowel-initial stems keep their inherent noun class prefix in the diminutivization process. Thus, we can say that the double prefixation with vowel-initial stems is not specific to class 5. The explanation of these facts has to be found in the syllable structure of the -CV-VCV(CV) nouns.

(20) Stems (other than class 5)

a. -CVCV...			Cl.12 (sg.)	Cl.13 (pl.)	
<i>n-sáku</i>	(3)	'bag'	<i>ka-sáku</i>	<i>tu-sáku</i>	
<i>ci-juni</i>	(7)	'bird'	<i>ka-juni</i>	<i>tu-juni</i>	
<i>n-gúku</i>	(9)	'hen'	<i>ka-kúku</i>	<i>tu-kúku</i>	
<i>n-kayidi</i>	(1)	'prisoner'	<i>ka-kayidi</i>	<i>tu-kayidi</i>	
<i>lu-kolomá</i>	(11)	'ditch'	<i>ka-kolomá</i>	<i>tu-kolomá</i>	
<i>wu-lombeelá</i>	(14)	'marriage'	<i>ka-lombeelá</i>	<i>tu-lombeelá</i>	
b. -VCV...			Cl.12 (sg.)	Cl.13 (pl.)	Cl.13 (pl.)
				(alternative)	
<i>mw-iisi</i>	(3)	'pestle'	<i>ka-mw-iisi</i>	<i>tu-mw-iisi</i>	<i>tu-mi-isi</i>
<i>mw-éésí</i>	(3)	'moon'	<i>ka-mw-éésí</i>	<i>tu-mw-éésí</i>	<i>tu-my-éésí</i>
<i>c-áálá</i>	(7) ¹⁰	'finger'	<i>ka-c-áálá</i>	<i>tu-c-áálá</i>	<i>tu-y-áálá</i>
<i>mw-aanáce</i>	(1)	'child'	<i>ka-mw-aanáce</i>	<i>tu-mw-aanáce</i>	<i>tu-va-anáce</i>
<i>c-eenjelele</i>	(7)	'soot'	<i>ka-c-eenjelele</i>	<i>tu-c-eenjelele</i>	<i>tu-y-eenjelele</i>
<i>c-aanáasa</i>	(7)	'mercy'	<i>ka-c-aacáasa</i>	<i>tu-c-aanáasa</i>	<i>tu-y-aanáasa</i>

The two ways of deriving a plural diminutive having a vowel-initial stem are illustrated in (21).¹¹

(21) a. singular		diminutive		plural
<i>dí-íná</i>	→	<i>ka-dí-íná</i>	→	<i>tu-dí-íná</i>
<i>mw-aanáce</i>	→	<i>ka-mw-aanáce</i>	→	<i>tu-mw-aanáce</i>
b. singular		plural		diminutive
<i>dí-íná</i>	→	<i>m-ééná</i>	→	<i>tu-m-ééná</i>
<i>mw-aanáce</i>	→	<i>va-anáce</i>	→	<i>tu-va-anáce</i>

¹⁰ Class 7 *ci-* becomes *cy-* before a vowel, which is then simplified to the alveopalatal affricate [č].

¹¹ Although we present a derivational account of the facts here, this is not a necessary feature of the analysis. The insight we wish to express is that the "correspondences" between the input noun and the derived plural diminutive may be perceived either as a pluralization of a derived diminutive or as a diminutivization of a plural.

In (21a), we first diminutivize (by prefixing diminutive singular *ka-* to the nouns) and then pluralize (by replacing the diminutive singular prefix *ka-* by the corresponding plural *tu-*). In (21b) pluralization precedes diminutivization, in the sense that we first replace the normal singular marker *di-* by the normal plural marker *ma-*. Then we diminutivize by adding to the plural nouns the diminutive plural marker *tu-*. We thus see that there are two “paths” to plural diminutivization.

The order in which the diminutivization and pluralization processes are applied can be seen by the order of the inner prefixes present in the output. When diminutivization precedes pluralization, the end result presents the diminutive plural prefix attached to the inherent singular marker as in (21a). When pluralization precedes diminutivization the output comes with the diminutive marker attached to the inherent plural marker, as in (21b). The availability of two such paths to plural diminutivization is not evident with stems which begin with a consonant. In this case, both orders yield the correct results.¹²

Now consider in (22) the diminutive of monosyllabic stems. In (22), we see that the diminutive prefixes *ka-* and *tu-*, like the plural prefix *ma-*, cannot be directly prefixed to a class 5 monomoraic -CV stem. As a result, forms are obtained with the double prefixes *ka-dii-* and *tu-dii-*.

(22) -CV stem				
Cl.5 (sg.)		Cl.12 (sg.)	Cl.13 (pl.)	Cl.13 (pl.) (alternative)
<i>dii-pé</i>	‘spear grass’	<i>ka-dii-pé</i>	<i>tu-dii-pé</i>	* <i>tu-ma-dii-pé</i>
<i>dii-sí</i>	‘side of a river’	<i>ka-dii-sí</i>	<i>tu-dii-sí</i>	* <i>tu-ma-dii-sí</i>
<i>dii-wú</i>	‘ashes’	<i>ka-dii-wú</i>	<i>tu-dii-wú</i>	* <i>tu-ma-dii-wú</i>

In (23) we exemplify the two paths by which plural diminutives are formed from nouns having -CV stems.

(23) a. singular		plural		diminutive
<i>dii-pé</i>	→	<i>ma-dii-pé</i>	→	<i>tu-dii-pé</i>
<i>dii-wú</i>	→	<i>ma-dii-wú</i>	→	<i>tu-dii-wú</i>
b. singular		diminutive		plural
<i>dii-pé</i>	→	<i>ka-dii-pé</i>	→	<i>tu-dii-pé</i>
<i>dii-wú</i>	→	<i>ka-dii-wú</i>	→	<i>tu-dii-wú</i>

When *ma-dii-pé* is diminutivized, as in (23a), or when *ka-dii-pé* is pluralized, as in (23b), the outer prefix is replaced in the process. We therefore do not obtain

¹² This fact can be seen in the following derivations yielding equivalent outputs:

(a) *dí-wíwí* ‘chicken’ → *ka-wíwí* ‘small chicken’ → *tu-wíwí* ‘small chickens’ (Dim ⊃ Plur)
 (b) *dí-wíwí* ‘chicken’ → *ma-wíwí* ‘chickens’ → *tu-wíwí* ‘small chickens’ (Plur ⊃ Dim)

forms with three prefixes, such as **tu-ma-dii-pé*, since the bimoraic condition on the base to which *tu-* is prefixed is met by the singular prefix *dii-* plus the monomoraic stem. Thus, *ma-* must be truncated as in other cases of diminutivization.

Consider next a set of data illustrating nouns having -CV stems but from classes other than class 5. The process of diminutivizing is similar to what was seen in (20) and (21). The one difference is that plural prefixes such as *mi-* (cl.4) and *yi-* (cl.8) are attached directly to the stem (vs. class 6 *ma-* which requires the singular prefix to be present).

(24) -CV stem (other than class 5)

	Cl.12 (sg.)	Cl.13 (pl.)	Cl.13 (pl.) (alternative)
<i>mu-si</i> (3) 'village'	<i>ka-mu-si</i>	<i>tu-mu-si</i>	<i>tu-mi-si</i>
<i>ci-pi</i> (7) 'darkness'	<i>ka-ci-pi</i>	<i>tu-ci-pi</i>	<i>tu-yi-pi</i>
<i>ci-pó</i> (7) 'pimple'	<i>ka-ci-pó</i>	<i>tu-ci-pó</i>	<i>tu-yi-pó</i>

There are, then, two possible paths (25) to forming plural diminutives: diminutivization may precede pluralization or, vice-versa, pluralization may precede diminutivization, though the resulting output differs. Both sets of output are well-formed, since *tu-* is followed by two moras. The derivation in (25) is similar to the one seen previously with vowel-initial stems in (21).

(25) a. singular		diminutive		plural	
	<i>mu-si</i>	→	<i>ka-mu-si</i>	→	<i>tu-mu-si</i>
	<i>ci-pó</i>	→	<i>ka-ci-pó</i>	→	<i>tu-ci-pó</i>
b. singular		plural		diminutive	
	<i>mu-si</i>	→	<i>mi-si</i>	→	<i>tu-mi-si</i>
	<i>ci-pó</i>	→	<i>yi-pó</i>	→	<i>tu-yi-pó</i>

In this section we have seen that, while the *di-/dii-* alternation has no independent effect on the diminutivization process, diminutivization on -CV noun stems is dependent on the mora count in the stem. We conclude from the data in (21), (22), and (24) that Ciyao diminutivizers cannot be attached directly to monomoraic stems. Rather, they are attached to a prefixed noun, thereby satisfying the minimality requirement of two moras. On the other hand, *ka-/tu-* are prefixed directly to stems if they are at least bimoraic. When the stem is vowel-initial, the rules which apply to -CV stems are expanded to these roots and double prefixation is obtained. This, we assume, is due to the fusion processes which take place at the boundary between the prefix and the -VCV stem. This conclusion can also be extended to Cimwera [Harries 1950, Stump 1992], which has some of the same properties as Ciyao, its closest relative.

3.2. Morphologically conditioned allomorphy. Thus far we have shown that there are two allomorphs of class 5 prefix in Ciyao whose selection is prosodically conditioned based on mora count. In this section we will show how the occurrence of these allomorphs is, in some contexts, morphologically conditioned, based on the locativization process of class 5 nouns.

In Ciyao there are three locative class prefixes, namely, *pa-* (cl.16), *ku-* (cl.17) and *mu-* (cl.18), which roughly mean ‘at’, ‘to’, and ‘in’, respectively. In this section we investigate how the locative prefixes affect the morphology (and phonology) of class 5 nouns. Consider the forms in (26), where the locative prefixes *pa-*, *ku-*, and *mu-* are prefixed to nouns which take monomoraic prefix *di-*.

(26) a. *di*-CVVCV stems

di-wíwi ‘chicken’

Class 16

i. *pa-di-wíwi*

ii. *p-ee-wíwi*

Class 17

ku-di-wíwi

kw-ii-wíwi

Class 18

n'-di-wíwi

mw-ii-wíwi

di-kúuga ‘group’

Class 16

i. *pa-di-kúuga*

ii. *p-ee-kúuga*

Class 17

ku-di-kúuga

kw-ii-kúuga

Class 18

n'-di-kúuga

mw-ii-kúuga

b. *di-* with longer stems

di-piikanilo ‘ear’

Class 16

i. *pa-di-piikanilo*

ii. *p-ee-piikanilo*

Class 17

ku-di-piikanilo

kw-ii-piikanilo

Class 18

n'-di-piikanilo

mw-ii-piikanilo

di-puundúgulú ‘cloud’

Class 16

i. *pa-di-puundúgulú*

ii. *p-ee-puundúgulú*

Class 17

ku-di-puundúgulú

kw-ii-puundúgulú

Class 18

n'-di-puundúgulú

mw-ii-puundúgulú

As shown in both (26a) and (26b), there are two acceptable ways of locativizing the respective nouns. In (i) we have the locativizer plus *di-* and in (ii) the locativizer plus *i-*. The same variation in form occurs when /di-/ is followed by a preconsonantal nasal, as in (27).

(27) a. *di-* with moraic NC-initial stems*dii-mbáciiga* ‘swollen gland’

Class 16	Class 17	Class 18
i. <i>pa-dii-mbáciiga</i>	<i>ku-dii-mbáciiga</i>	<i>n'-dii-mbáciiga</i>
ii. <i>p-ee-mbáciiga</i>	<i>kw-ii-mbáciiga</i>	<i>mw-ii-mbáciiga</i>

dii-mbanaanga ‘splendour’

Class 16	Class 17	Class 18
i. <i>pa-dii-mbanaanga</i>	<i>ku-dii-mbanaanga</i>	<i>n'-dii-mbanaanga</i>
ii. <i>p-ee-mbanaanga</i>	<i>kw-ii-mbanaanga</i>	<i>mw-ii-mbanaanga</i>

b. *di-* with non-moraic NC-initial stems*di-ngwíta* ‘bracelet’

Class 16	Class 17	Class 18
i. <i>pa-di-ngwíta</i>	<i>ku-di-ngwíta</i>	<i>n'-di-ngwíta</i>
ii. <i>p-ee-ngwíta</i>	<i>kw-ii-ngwíta</i>	<i>mw-ii-ngwíta</i>

di-mbaala ‘gruel’

Class 16	Class 17	Class 18
i. <i>pa-di-mbaala</i>	<i>ku-di-mbaala</i>	<i>n'-di-mbaala</i>
ii. <i>p-ee-mbaala</i>	<i>kw-ii-mbaala</i>	<i>mw-ii-mbaala</i>

The data in (26) and (27) thus show that, unlike pluralization via class 6 and diminutivization through classes 12 and 13 whose prefixes usually “replace” the inherent noun class prefix, locative prefixes are always attached to the nouns and not to the stems. This fact suggests that we look at the locatives as secondary prefixes “par excellence”. Semantically, they provide secondary, adverbial, information about the noun they are attached to—localization in space or time—and, morphologically, they do not interfere significantly with the structure of the noun. The word *significantly* is important here because, as shown in (ii), the affixation of the locatives to the class 5 nouns appears to trigger an optional deletion of the consonant of the class 5 prefix through a process which can be represented as in (28).

(28)	pa	+	di	→	pai	→	pee	(cl.16)
	ku	+	di	→	kui	→	kwii	(cl.17)
	mu	+	di	→	mui	→	mwii	(cl.18)

The derivational schema in (28) illustrates our analysis in which a d-deletion rule applies optionally to the class 5 prefix when locative prefixes are attached to class 5 nouns. As a consequence, the inherent class 5 prefix vowel is left unprotected and fuses with the locative prefix, triggering the regular rules of

vowel coalescence $a + i \rightarrow ee$ (when the locative marker is *pa-*) and gliding $u + i \rightarrow wii$ (when the locative marker is *ku-* or *mu-*). No other noun class prefix may delete its consonant under locativization as does class 5, as illustrated by the examples in (29).

(29)		Class 16	Class 17	Class 18
<i>muu-ndu</i> (1)	'person'	i. <i>pa-muu-ndu</i> ii. * <i>p-oo-ndu</i>	<i>ku-muu-ndu</i> * <i>ku-u-ndu</i>	<i>m-muu-ndu</i> * <i>mu-u-ndu</i>
<i>vaa-ndu</i> (1)	'persons'	i. <i>pa-vaa-ndu</i> ii. * <i>pa-a-ndu</i>	<i>ku-vaa-ndu</i> * <i>kw-aa-ndu</i>	<i>mu-vaa-ndu</i> * <i>mw-aa-ndu</i>
<i>mu-si</i> (3)	'village'	i. <i>pa-mu-si</i> ii. * <i>p-oo-si</i>	<i>ku-mu-si</i> * <i>ku-u-si</i>	<i>mu-mu-si</i> * <i>mu-u-si</i>
<i>mi-si</i> (4)	'villages'	i. <i>pa-mi-si</i> ii. * <i>p-ee-si</i>	<i>ku-mi-si</i> * <i>kw-i-si</i>	<i>m-mi-si</i> * <i>m-i-si</i>
<i>ma-wútá</i> (6)	'oil'	i. <i>pa-ma-wútá</i> ii. * <i>pa-a-wútá</i>	<i>ku-ma-wútá</i> * <i>kw-a-wútá</i>	<i>m-ma-wútá</i> * <i>mw-a-wútá</i>
<i>ci-tútu</i> (7)	'ashpit'	i. <i>pa-ci-tútu</i> ii. * <i>p-ee-tútu</i>	<i>ku-ci-tútu</i> * <i>kw-i-tútu</i>	<i>n'-ci-tútu</i> * <i>mw-i-tútu</i>
<i>yi-tútu</i> (8)	'ashpits'	i. <i>pa-yi-tútu</i> ii. * <i>p-ee-tútu</i>	<i>ku-yi-tútu</i> * <i>kw-i-tútu</i>	<i>n'-yi-tútu</i> * <i>mw-i-tútu</i>
<i>m-bwá</i> (9/10)	'dog(s)'	i. <i>paa-m-bwá</i> ii. * <i>pa-bwá</i>	<i>kuu-m-bwá</i> * <i>ku-bwá</i>	<i>muu-m-bwá</i> * <i>mu-bwá</i>
<i>lu-kújú</i> (11)	'fig'	i. <i>pa-lu-kújú</i> ii. * <i>p-oo-kújú</i>	<i>ku-lu-kújú</i> * <i>ku-u-kújú</i>	<i>n'-nu-kújú</i> * <i>mu-u-kújú</i>
<i>ka-pwá</i> (12)	'puppy'	i. <i>pa-ka-pwá</i> ii. * <i>pa-a-pwá</i>	<i>ku-ka-pwá</i> * <i>kw-a-pwá</i>	<i>n'-ka-pwá</i> * <i>mw-a-pwá</i>
<i>tu-wúpá</i> (13)	'sm. bones'	i. <i>pa-tu-wúpá</i> ii. * <i>p-oo-wúpá</i>	<i>ku-tu-wúpá</i> * <i>ku-u-wúpá</i>	<i>n'-tu-wúpá</i> * <i>mu-u-wúpá</i>
<i>wu-úji</i> (14)	'gruel'	i. <i>pa-wu-úji</i> ii. * <i>p-oo-úji</i>	<i>ku-wu-úji</i> * <i>ku-u-úji</i>	<i>mu-wu-úji</i> * <i>mu-u-úji</i>

With this fact established, let us consider examples of class 5 nouns which take bimoraic prefix *dii-* (30). Here we observe that the process of affixation of locative prefixes to class 5 nouns whose prefixes are bimoraic does not differ from what we saw in (26) and (27). Again there are two acceptable ways of locativizing a class 5 nominal. It would thus appear that the number of moras in the prefix does not affect the output of affixation of locative prefixes to class 5 nouns.

(30) a. *dii-* with -CVCV stems

		Class 16	Class 17	Class 18
<i>dii-tivi</i>	'valley'	i. <i>pa-dii-tivi</i>	<i>ku-dii-tivi</i>	<i>n'-dii-tivi</i>
		ii. <i>p-ee-tivi</i>	<i>kw-ii-tivi</i>	<i>mw-ii-tivi</i>
<i>dii-jóká</i>	'snake'	i. <i>pa-dii-jóká</i>	<i>ku-dii-jóká</i>	<i>n'-dii-jóká</i>
		ii. <i>p-ee-jóká</i>	<i>kw-ii-jóká</i>	<i>mw-ii-jóká</i>

b. *dii-* with -CVCVVNCV stem

		Class 16	Class 17	Class 18
<i>dii-pujuungu</i>	'vapor'	i. <i>pa-dii-pujuungu</i>	<i>ku-dii-pujuungu</i>	<i>n'-dii-pujuungu</i>
		ii. <i>p-ee-pujuungu</i>	<i>kw-ii-pujuungu</i>	<i>mw-ii-pujuungu</i>

Affixation of the locatives to the bimoraic class 5 prefix raises the question of what is deleted. Is it the consonant /d/ as was suggested above or it is the full mora *di-*? While we have spoken of a rule of d-deletion thus far, the facts in (30) suggest another hypothesis which is truer to the historical events that produced this situation. Recall from §1 that Meeussen reconstructs **i-* as the class 5 noun prefix and an augment + prefix sequence **di-i-*. Our hypothesis is that we do not have a rule of d-deletion, but rather a specific class 5 allomorph *i-* that shows up only under locativization. This allomorphy produces the output forms in (31).

(31)	<i>pa</i>	+	<i>-i</i>	→	<i>pa-i</i>	→	<i>pee</i>	(cl.16)
	<i>ku</i>	+	<i>-i</i>	→	<i>ku-i</i>	→	<i>kwii</i>	(cl.17)
	<i>mu</i>	+	<i>-i</i>	→	<i>mu-i</i>	→	<i>mwii</i>	(cl.18)

Although Ciyao has lost the historical Bantu augment, historically **pa-*, **ku-*, and **mu-* replaced the augment **di-* that preceded the prefix **i-*. Or, put slightly differently, locative prefixes were followed by augmentless prefixes: *pa-i-*, not *pa-di-i-*. Since other cases of *dii-* have been reanalyzed as monomorphemic (conditioned by mora count), we suggest a further restructuring whereby *i-* became a third allomorph of the class 5 prefix in present-day Ciyao: When preceded by one of the above three locative prefixes, a class 5 noun prefix which is normally *di-* or *dii-* (determined by prosodic considerations) can optionally be *i-*.¹³

¹³ As pointed out to me by Larry Hyman (pers. comm.), a similar allomorphy *di-/i-* appears in Kinande where the normal class 5 prefix *di-* surfaces as *i-* rather than *di-* when the class 5 noun is localitized. So, in both languages there is historical evidence that the class 5 prefix vowel which surfaces when the noun is localitized is a relic of the Proto-Bantu **i-*. The major difference between the two languages however, is that in Kinande *di-* and *i-* are in complementary distribution. The allomorph *di-* never surfaces after locative prefix, contexts where allomorph *i-* is the only realization regardless of the structure of the noun stem. In Ciyao, as mentioned above, the vestige of Proto-Bantu **i-* appears optionally only when the noun stem is at least bimoraic and has a consonant in stem-initial position. Another language where we find a similar situation is Luba-Kasai. In this language the class 5 prefix has two allomorphs, *i-* and *di-*. The former occurs optionally, just like in Ciyao, with some forms of locative [Kadima, 1969:38] and the latter occurs elsewhere.

From the analysis presented here we can conclude that the class 5 prefix has three allomorphs in Ciyao, listed in (32).

- (32) Class 5 → i- / locative ___ (optional)
 dii- / ___ noun stem [μ(μ)]
 di- / elsewhere

To complete this discussion, consider locativization of class 5 nouns with -VCV stems given in (33).

(33) -VCV stems		Class 16	Class 17	Class 18
a. <i>dí-íná</i>	'name'	i. <i>pa-dí-íná</i>	<i>ku-dí-íná</i>	<i>n'-dí-íná</i>
		ii. <i>*p-ee-ná</i>	<i>*kw-ii-ná</i>	<i>*mw-ii-ná</i>
<i>dí-ínó</i>	'tooth'	i. <i>pa-dí-ínó</i>	<i>ku-dí-ínó</i>	<i>n'-dí-ínó</i>
		ii. <i>*p-ee-nó</i>	<i>*kw-ii-nó</i>	<i>*mw-ii-nó</i>
<i>dí-ísó</i>	'eye'	i. <i>pa-dí-ísó</i>	<i>ku-dí-ísó</i>	<i>n'-dí-ísó</i>
		ii. <i>*p-ee-só</i>	<i>*kw-ii-só</i>	<i>*mw-ii-só</i>
b. <i>dy-aája</i>	'Afr. breadfruit'	<i>pa-dy-aája</i>	<i>ku-dy-aája</i>	<i>n'-dy-aája</i>
<i>dy-oóla</i>	'frog'	<i>pa-dy-oóla</i>	<i>ku-dy-oóla</i>	<i>n'-dy-oóla</i>
<i>dy-uúngu</i>	'pumpkin'	<i>pa-dy-uúngu</i>	<i>ku-dy-uúngu</i>	<i>n'-dy-uúngu</i>
<i>dy-úúvá</i>	'sun, day'	<i>pa-dy-úúvá</i>	<i>ku-dy-úúvá</i>	<i>n'-dy-úúvá</i>
<i>dy-óogo</i>	'first bath...'	<i>pa-dy-óogo</i>	<i>ku-dy-óogo</i>	<i>n'-dy-óogo</i>
<i>dy-óósí</i>	'smoke'	<i>pa-dy-óósí</i>	<i>ku-dy-óósí</i>	<i>n'-dy-óósí</i>

In this case there is only one correct result: prefixation of *pa-*, *ku-*, or *n'-* to the fused class 5 prefix *di-* or *dy-*. These data may be interpreted as further evidence that the "unprotected" vowel /i/ is a relic of class 5 prefix *i- and not part of *di-* which remains behind when /d/ is deleted. As proposed by Hyman and Katamba [1997], it appears that *di- was also used as the basic class 5 prefix before stems beginning with a vowel—whether inherited from Proto-Bantu or obtained by deletion of *j. Thus, the reason we fail to obtain intermediate forms such as *pa-i-íná*, *pa-i-ája*, etc. in (33) is that the *i- prefix never occurred in this position. Synchronically, what this means is that there must be a further condition on the first allomorph in (32), which must not be available when the following noun stem is vowel-initial.

Compare this with the locativization of nouns having -CV stems. The data in (34) behave like those in (33); the locative prefix can only be attached to the class 5 *dii-* allomorph. The data in (34b) constitute evidence that locatives are attached not only to class 5 nouns, but to nouns belonging to any class, without deleting the prefix.

(34)		Class 16	Class 17	Class 18
	a. -CV stem (class 5)			
	<i>dii-pé</i> ‘spear grass’	i. <i>pa-dii-pé</i>	<i>ku-dii-pé</i>	<i>n'-dii-pé</i>
		ii. <i>*p-ee-pé</i>	<i>*kw-ii-pé</i>	<i>*mw-ii-pé</i>
	<i>dii-sí</i> ‘side of a river’	i. <i>pa-dii-sí</i>	<i>ku-dii-sí</i>	<i>n'-dii-sí</i>
		ii. <i>p-ee-sí</i>	<i>*kw-ii-sí</i>	<i>*mw-ii-sí</i>
	<i>dii-wú</i> ‘ashes’	i. <i>pa-dii-wú</i>	<i>ku-dii-wú</i>	<i>n'-dii-wú</i>
		ii. <i>*p-ee-wú</i>	<i>*kw-ii-wú</i>	<i>*mw-ii-wú</i>
	b. -CV stem (other than class 5)			
	<i>mu-si</i> (3) ‘village’	<i>pa-mu-si</i>	<i>ku-mu-si</i>	<i>m-mu-si</i>
	<i>ci-pi</i> (7) ‘darkness’	<i>pa-ci-pi</i>	<i>ku-ci-pi</i>	<i>n-ci-pi</i>
	<i>ci-pó</i> (7) ‘pimple’	<i>pa-ci-pó</i>	<i>ku-ci-pó</i>	<i>n-ci-pó</i>

A comparison of the data in (33)-(34) on the one hand, with those in (26)-(27) and (30) on the other hand, allows us to see that locatives do not discriminate among nouns in terms of the mora count. Both in (26)-(27) and (30) and in (33)-(34), locative prefixes are attached to nouns through the inherent prefix regardless of the number of moras in the noun stem. However, it is important to note that, with the exception of *p-ee-sí* (33a) which means ‘across’, the third class 5 allomorph *i-* never surfaces when the stem is monomoraic. That is, if the noun stem has fewer than two moras, the *i-* allomorph is not available. Thus the complete statement on the *i-* allomorph must be as in (35).

(35) Class 5 → *i-* / locative __ [Cμμ...] (optional)

The class 5 prefix may optionally be spelled out as *i-* if it is preceded by a locative prefix and if its stem begins with a consonant and contains at least two moras.¹⁴

¹⁴ In the interest of completeness, we note that locative and diminutive prefixes can co-occur in the same word not only with the primary prefixes (*di-* and *ma-* in our case), but also with each other, as in the following examples:

- | | | | |
|-------------------------|-------------------------------|-------------------------|-------------------------|
| (a) <i>pa-ka-díínó</i> | ‘at the small tooth’ | (b) <i>ku-ka-díínó</i> | ‘to the small tooth’ |
| <i>pa-tu-dyuúngu</i> | ‘at the small pumpkins’ | <i>ku-tu-dyuúngu</i> | ‘to the small pumpkins’ |
| <i>pa-tu-díiwú</i> | ‘at the small ashes’ | <i>ku-tu-díiwú</i> | ‘to the small ashes’ |
| <i>pa-kaa-mbanaanga</i> | ‘at the small light’ | <i>ku-kaa-mbanaanga</i> | ‘to the small light’ |
| <i>pa-tu-páta</i> | ‘at the sm. temp. dams’ | <i>ku-tu-páta</i> | ‘to the sm. temp. dams’ |
| (c) <i>n-ka-díínó</i> | ‘in the small tooth’ | | |
| <i>n-tu-dyuúngu</i> | ‘in the small pumpkins’ | | |
| <i>n-tu-díiwú</i> | ‘in the small ashes’ | | |
| <i>n-kaa-mbanaanga</i> | ‘in the small light’ | | |
| <i>n-tu-páta</i> | ‘in the small temporary dams’ | | |

4. Conclusion

From the preceding discussion we conclude the following about Ciyao:

First, class 5 has three allomorphs, namely, *i-*, which surfaces optionally after locatives when the noun stems are consonant-initial and at least bimoraic; *dii-*, which is prosodically conditioned (requiring that the noun stem be bimoraic at most); and monomoraic *di-*, which occurs elsewhere.

Second, the diminutive prefixes *ka-* and *tu-* behave like class 6 prefix *ma-* in that they count the number of moras in the stem before their affixation. If the noun stem contains at least two moras, the diminutive prefixes are attached to the stems. If the noun stem is subminimal (i.e., monomoraic), *ka-* or *tu-* is attached to the full noun (i.e., inherent prefix + stem).

Third, locatives behave as genuine secondary prefixes. They are always attached to full nouns, not to the stems, regardless of the number of the moras in the stem.

REFERENCES

- Clements, George N. 1986. "Compensatory Lengthening and Consonant Gemination in Luganda." In L. Witzel and E. Sezer (Eds.), *Studies in Compensatory Lengthening*. Dordrecht: Foris, 37-77.
- De Blois, Kees F. 1970. "The augment in Bantu languages." *Africana Linguistica* IV: 85-165. Tervuren: Musée Royal de l'Afrique Centrale.
- Guthrie, Malcolm. 1967-71. *Comparative Bantu*. Farnborough, England: The Gregg International Publishers.
- Harries, Lyndon. 1950. *A Grammar of Mwera*. Johannesburg: Witwatersrand University Press.
- Hayes, Bruce. 1989. "Compensatory lengthening in moraic phonology." *Linguistic Inquiry* 20, 2: 153-306.

The order in which the prefixes appear on the surface forms cannot be reversed. From the observation of the examples above it is reasonable to conclude that among the secondary prefixes a distinction is necessary to draw between those which are attached at the lexical level and those that are added postlexically. In the former group we could have the diminutives and in the latter the locatives. We thus can propose that primary prefixes are added at a stratum 1, diminutive prefixes at stratum 2, and locative prefixes (proclitics?) at stratum 3, i.e. as per their surface order.

- Hayes, Bruce. 1989. "Compensatory lengthening in moraic phonology." *Linguistic Inquiry* 20, 2: 153-306.
- Hubbard, Katheen. 1993. "The Manifestation of Vowel Quantity: A Comparative Study." Paper presented at the 24th ACAL, The Ohio State University.
- Hubbard, Katheen. 1994. *Duration in Moraic Theory*. Ph.D. dissertation, UC Berkeley.
- Hubbard, Katheen, 1995. "Towards a theory of phonological and phonetic timing: evidence from Bantu. In Bruce Connell and Amalia Arvaniti (eds.), *Phonology and Phonetics Evidence. Papers in Phonology Laboratory IV*. Cambridge: Cambridge University Press. Pp. 168-187.
- Hyman, Larry M. 1985. *A Theory of Phonology Weight*. Dordrecht: Foris Publications.
- Hyman, Larry M. and Francis X. Katamba. 1997. "The syllable in Luganda phonology and morphology." MS.
- Hyman, Larry M. and Armindo Ngunga. 1994. "On non-universality of tonal association 'conventions': evidence from Ciyao." *Phonology* 11-25-68.
- Hyman, Larry M. and Armindo S. A. Ngunga. 1997. "Two kinds of moraic nasal in Ciyao." *Studies in African Linguistics* 26, 2:131-163.
- Kadima, Marcel. 1969. *Le systeme des classes en bantou*. Leuven: Vander.
- McCarthy, J. and A. Prince. 1995. "Faithfulness and reduplicative identity." *Papers in Optimality Theory. University of Massachusetts Occasional Papers in Linguistics* 18.249-384.
- Maddieson, Ian. 1993. "Splitting the Mora." *UCLA Working Papers in Phonetics* 83:9-18.
- Maddieson, Ian and Peter Ladefoged. 1993. "Phonetics of partially nasal consonants." In Marie K. Huffman and Rena Krakow (eds.), *Phonetics and Phonology* 5: 251-301.
- Meeussen, A. E. 1967. "Bantu grammatical reconstructions." *Africana Linguistica* 3: 81-121. Tervuren: Musée Royale de l'Afrique Centrale. Annales—Sciences Humaines, Série IN-8, No. 121.

- Ngunga, Armindo S. A. 1987. "A comparison of Shona and Yao noun classes." MS. Harare: University of Zimbabwe.
- Ngunga, Armindo S. A. 1995. "Phonetics and phonology of vowel length in Ciyao." MS. Berkeley: University of California.
- Stump, Gregory T. 1992. "The adjacency condition and formation of diminutives in Mwera and Kikuyu." In Laura A. Buszard-Welcher, Lionel Wee, and William Weigel (eds.), *Proceedings of the 18th Annual Meeting of the BLS: general session*, Berkeley: Pp. 441-452.
- Sanderson, G. Meredith. 1922. *A Yao Grammar*. London: Society for Promoting Christian Knowledge.
- Sanderson, G. Meredith. 1954. *Yao Dictionary*. Zomba, Malawi: Government Printer.
- Whiteley, W.H. 1961. *Shape and Meaning in Yao Nominal Classes*. ALS ii. ????
- Whiteley, W.H. 1966. *A Study of Yao Sentences*. Oxford: Oxford University Press.

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TOWARD A TYPOLOGY OF DIRECTIONAL MOTION FOR AFRICAN LANGUAGES*

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This paper examines the syntactic and semantic expression of basic directional motion and its manner counterparts across the four language phyla of Africa. We sample languages from each phylum, concentrating on basic, non-deictic, directional motion and its counterpart in which motion, direction, and manner of motion occur simultaneously. Two primary findings emerge. Across Africa, basic directional motion tends to be verb-framed with respect to direction; it conflates the semantic components Motion+Direction in verbs equivalent to 'enter, circle, traverse'. Manner of motion, while maintaining this lexicalization pattern, syntactically registers a Motion+Direction verb and its linear order relative to a Manner verb through either of two primary strategies. Manner precedes Motion+Direction when the two verbs are conveyed through serial verb sequences, verb compounding, or verb coordination. Manner follows Motion+Direction when the former is specified as a deranked verbal form, e.g., as a gerundive, or as part of a deranked clause, e.g., a subordinate clause.

1. Introduction

The linguistic structuring of physical motion events continues to be of keen interest to investigators exploring the interface between syntax and the lexicon [Gruber 1976, Jackendoff 1990, Talmy 1985, 1991, Levin and Rappaport-Hovav 1995]. To encode these events, two semantic elements are fundamental: MOTION, the process

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of change in the spatial position of one entity relative to another, and DIRECTION, the course or trajectory taken by the moving entity. In a language like German, each of these elements is typically packaged in a distinct lexical form, e.g., Motion in a verb such as *gehen* and Direction in a preposition like *über*: *Der Junge ging über die Strasse* 'The boy went across the road.' In French, however, these same elements are incorporated in a single lexical form, as shown by *traverser* 'to cross', in *Le garçon traversait la rue* 'The boy was crossing the road.'

Directional motion events stand in contrast to events lacking Direction but not Motion. These non-directional- or confined-motion events signal the orientation of a reference point to a moving entity. In French, this is accomplished through adpositions like *dans* in (1a) or *devant* in (1b).

- (1) a. *il court dans la chambre*
 he run LOC the room
 'he runs inside the room'
- b. *il court devant la maison*
 he run in-front-of the house
 'he runs in front of the house'

That orienting adpositions in these examples do not realize Direction is suggested by their occurrence with contrasting directions. The form *dans* is found with the distinct directions 'up' and 'down' in (2). Although not bearers of direction, French adpositions occur in directional motion structures as characterizations of reference point objects. In (2), *dans* fosters construal of the reference point objects, *chambre* and *cave*, as enclosures for the direction bearing verbs *monter* 'to ascend, to move up to' and *descendre* 'to descend, to move down to.'

- (2) a. *il monte dans sa chambre*
 he ascend LOC his room
 'he ascends to his room'
 'he moves up to his room'
- b. *il descend dans la cave*
 he descend LOC the basement
 'he descends to the basement'
 'he moves down to the basement'

Further evidence that adpositions can express orientation rather than direction is highlighted by directional constructions in French. When pronominal forms designate reference point objects, the directional interpretation of the verbs *monter* and *descendre* is retained, even though the orienting adposition is not.

- (3) a. *il y monte*
 he there ascend
 'he ascends there'
- b. *il y descend*
 he there descends
 'he descends there'

Orienting adpositions may serve to identify a directional events bounded or unbounded character [Jackendoff 1983]. Through their presence, they signal that the reference point binds the moving entity to an initial or final locus, a source or goal, respectively. In (3a), *de* 'from' marks initial locus or source, whereas its absence with an unbounded motion event in (3b) reveals a reference point serving as neither source nor goal.

- (4) a. *il sort de la chambre*
 he exit from the room
 'he exits from the room'
- b. *il longe la rivière*
 he move-along the river
 'he moves along the river'

Returning to basic directional motion, we find a contrast in its lexical packaging which Talmy [1985, 1991] differentiates under the rubric verb-framing vs. satellite-framing. His crosslinguistic analysis of directional motion reveals how languages tend toward either verb-framing, e.g., the French verb *traverser* in (5a) incorporating Motion+Direction, or satellite-framing, e.g., the German verb *gehen* (*ging*) in (5b) expressing Motion in conjunction with a grammatical satellite in the form of a preposition or particle *über* conveying Direction.

- (5) a. *Le garçon traversait la rue*
 [Motion+Direction]
 'the boy was crossing the road'
- b. *Der Junge ging über die Strasse*
 [Motion] [Direction]
 'the boy went across the road'

In languages like English both verb-framing and satellite-framing occur as a result of historical borrowing [Talmy 1985]. Satellite-framing constructions (*move into: The woman moved into the house*) reflect an older Anglo-Saxon pattern,

whereas verb-framing constructions (*enter: The woman entered the house*) show the influence of borrowing from Norman French.

Events involving the simultaneous occurrence of Motion, Direction, and Manner reveal still additional lexicalization paths. Comparing English *run* with French *courir* ‘to run’, we see that Manner in English tends to conflate with Motion in the main clause verb, *run*, leaving Direction to be expressed in the adposition *into* (6). Manner in French, however, tends not to conflate with Motion, occurring instead in a gerundive form, *courant*, relative to a main clause verb incorporating Motion and Direction, e.g., *entrer* (7).

(6) *The woman ran* *into* *the house*
 [Motion+Manner][Direction]

(7) *il entre* *dans la maison en courant*
 [Motion+Direction] Manner
 ‘he enters the house by running’
 ‘he runs into the house’

This French example points to one of several possible syntactic strategies for expressing manner of directional motion. Motion+Direction *enter* can link to Manner *run* when both are coordinate in a ranked or main clause (*The woman ran and entered the house*), Manner is deranked in a gerundive or adposition (*The woman entered the house while running*), or Manner is deranked in a subordinate clause (*The woman entered the house, while she was running*).

As a final point regarding manner of directional motion, we will distinguish between transextensional and transpositional events. The latter involve the ballistic displacement of a transitive direct object but not its accompanying subject, e.g., *The child threw the ball onto the table*, or of an intransitive subject, e.g., *The child jumped onto the table (in a single bound)*.¹ Transextensional events, on the other hand, refer to extended, non-ballistic displacement of a transitive direct object and its accompanying subject vis-à-vis a locative reference point, e.g., *The child dragged the blanket into the room* or of an intransitive subject, e.g., *The child ran into the room*. This distinction, if not the terminology, appears consistent with discussions in Shibatani [1976] and Talmy [1976, 1985].

In this paper we undertake an initial examination of the linguistic structuring of basic directional motion and manner of directional motion across the four language

¹ That the distinction between transextensional and transpositional displacement applies to intransitive as well as transitive verbs is suggested by contrasting structures in the Edoid language Emai. Transextensional events with the intransitive manner verb *la* ‘to run’ require a directional verb, *o* ‘to enter,’ in series, *o lá ó vbí úkpódę* [he run enter LOC road] ‘he ran onto the road,’ whereas transpositional events with the intransitive manner verb *vbqq* ‘to jump,’ require the augmentative verb *fi* ‘to throw’ and the direction conveying change of location particle *o*, *o vbóó fi o vbí otqi* ‘he jumped onto the ground.’

phyla of Africa. We examine dictionary and grammar entries for languages in each phylum, concentrating on verbs expressing basic, non-deictic, directional motion.² We then investigate individual languages with respect to basic motion and manner of motion events, discussing each in separate sections. For these comparisons, we rely on a set of directional types as representative, including events which might be differentially construed as to their boundedness, e.g., ‘to enter, move into’ as bounded and ‘to move around, to circle’ as unbounded. Although the tentative nature of our findings must be emphasized, their import may prove useful to future, more detailed investigations of individual languages and language families. We turn now to analysis of languages in the phyla Afro-Asiatic, Khoisan, Nilo-Saharan, and Niger-Kordofanian.³

2. Basic Directional Motion

Basic motion events simultaneously display Motion and Direction. Lexical expression of these two components in African languages reveals a very strong tendency. Across Africa, basic motion events tend to be verb-framed with respect to Direction. That is, the components Motion+Direction merge in verbs equivalent to ‘enter, exit, traverse’.

2.1. Afro-Asiatic. Various languages in the Afro-Asiatic phylum evince verbs which conflate Motion+Direction. Arabic [Wehr 1979] shows *dakhal* ‘to enter’, *tarak* ‘to leave’, and *saʔad* ‘to ascend’; Amharic [Leslau 1973] *gebba* ‘to enter’, *wettʹa* ‘to exit’, *kebbebe* ‘to encircle’, *teshaggere* ‘to traverse’, and *werrede* ‘to descend’; and Mupun [Frajzyngier 1987] *ka* ‘to ascend’ and *siam* ‘to descend’.

Scrutiny of how semantic components are lexically apportioned in basic motion clauses in the Afro-Asiatic language Hausa [Newman and Ma Newman 1977] also discloses the incorporation of Motion+Direction. Hausa displays a consistent pattern of packaging Motion and Direction in the main verb of simple clauses. The verb forms *keewayā* ‘circle’, *shiga* ‘enter’, *hau* ‘ascend’, and *fita* ‘exit’ in (8) incorporate the semantic concept of Motion and a distinct Direction type. In addition, we see in (8d) that the adposition *daga* ‘from’ identifies its accompanying nominal as initial locus or source of a motion event whose direction is verb-framed, e.g., *fita* ‘to exit, to move out’.

² We recognize that dictionary or grammar entries in themselves may not be the most dependable source of information concerning the syntactic allocation of semantic components, particularly in the domain of motion. Yet, dictionary entries have been insightfully used to uncover lexical patterning [Dixon 1982].

³ For generously giving of their time and energy we would like to thank the following language consultants: Lionel Bender for Amharic, Robert Carlson for Supyire, Francis Egbokhare for Emai, John Hutchison for Kanuri, Kumbirai Mkanganwi for Shona, Joe McIntyre, Paul Newman, and Russell Schuh for Hausa, and Jan Snyman for !Xûu. Tswana data derive from Cole [1955] and fieldwork completed by the first author. For all languages in this paper, tonal values are presented only where information was marked and so provided by consultants.

- (8) a. *yaarò yaa keewà yaa wutaa*
 boy he circled fire
 'the child circled the fire'
- b. *yaarò yaa shìga ðaakii*
 boy he entered room.the
 'the boy entered the room'
- c. *bàreewâ-r taa hau tsaunìi*
 gazelle-the she ascended hill
 'the gazelle ascended the hill'
- d. *dookii yaa fìta dàgà shingee*
 horse-the he exit from corral
 'the horse exited the corral'

2.2. Khoisan. Basic directional motion in languages of the Khoisan phylum is verb-framed. In Ju'Hoan [Dickens 1994], we find *!'an* 'to ascend', *kharu* 'to descend', *g!a?ama* 'to enter', *glai* 'to exit', *n||humi* 'to encircle', and *thaha* 'to move through'; in !Xoo [Traill 1994] *!ai* 'to encircle', *!ua* 'to exit', *ulu* 'to enter', *tholo* 'to descend', and *!ahle* 'to ascend;' and in Nama [Hagman 1977] *≠'oa* 'to go out, exit' and *peé* 'to go away'.

Examination of lexical structure in clauses of the Khoisan language !Xûu [Snyman 1970] shows the fusion of Motion+Direction.⁴ In (9), each of the verbs *g!a?ama* 'enter', *||'hamm* 'circle', *glai* 'exit', and *≠xuru* 'ascend' lexicalizes the fact of Motion and the Direction of a moving object.

- (9) a. *!'hoama kaa g!a?ama tš'u'ho*
 boy the enter kraal
 'the boy entered the kraal'
- b. *da?ama kaa ||'hamm da?a*
 child the circle fire
 'the child circled the fire'
- c. */oe kaa glai tš'u'ho*
 horse the exit kraal
 'the horse exited/went out of the kraal'

⁴ Symbols used to express click sounds include the following: / for dental; || for alveolar lateral; ! for alveolar; and ≠ for palatoalveolar. In conjunction with clicks, "g" indicates voicing, "h" delayed aspiration, and "n" nasal flow.

- d. *!haa kaa ꞑxuru n!um*
 antelope the ascend hill
 ‘the antelope ascended the hill’

2.3. Nilo-Saharan. Nilo-Saharan languages, as suggested by our sample, express basic directional motion events with a Motion+Direction verb. We find in Luo [Creider 1993] *Iworo* ‘to encircle’, *donjo* ‘to enter’, *ciko* ‘to move towards’, *kadho* ‘to pass, go beyond’; in Fur [Jakobi 1990] *-kar-* ‘to enter’, *-jaab-* ‘to cross’, *-ufuŋo-* ‘to descend’, *-kur-* ‘to go out;’ in Nandi [Creider and Creider 1993] *ke:-la:ny* ‘to ascend’, *ke:-re:k* ‘to descend’, *ke:-la:nta* ‘to cross’, *ki:-mu:t* ‘to encircle’, and *kɔ-ma:nta* ‘to move out;’ and in Turkana [Dimmendaal 1983] *lɔm* ‘to enter’ and *irik* ‘to encircle’.⁵

A more detailed inquiry of Kanuri, a Nilo-Saharan language of Nigeria [Hutchison 1981, Cyffer 1994], bolsters the verb-framing contention. Kanuri consistently merges Motion+Direction in a main clause verb. In (10), *kargawo* ‘enter’, *jəwa* ‘ascend’, *dəriz* ‘circle’, and *coluwo* ‘exit, leave’ each compresses Motion as well as Direction into a single verb form. We also see in these examples that the suffixes *-ro* and *-lan* serve an orientation function particular to goal (Go) and source (So), respectively.⁶ That *-ro* expresses orientation rather than direction is suggested by its compatibility with the distinct directions of *kargawo* ‘enter’ in (10a) and of *jəwa* ‘to ascend’ in (10b).

- (10) a. *tada-də nyim-ro kargawo*
 child-the room-Go 3S.entered
 ‘the child entered the room’
- b. *ngəri-də kawu-ro jəwa*
 gazelle-the rock-Go 3S.ascended
 ‘the gazelle ascended the mountain’
- c. *tada-də kannu-də-ga dəriz-ə kəlwono*
 child-the fire-the-ACC 3S.circle-and 3S.join
 ‘the child circled the fire all the way’

⁵ The symbols “a, ɛ, ɪ, ɔ” represent vowels with [-ATR], while “a, e, i, o” represent vowels with [+ATR].

⁶ The following abbreviations are used in glosses throughout the paper:

ACC	accusative	Go	goal	PRF	perfective
APP	applicative	IMP	imperfective	PST	past
CONS	consecutive	LOC	locative	S	singular
CONT	continuous	NOM	nominative	SC	subject concord
DIS	displacement	PRT	participial	So	source
GEN	genitive				

A number alone refers to a noun class in Tswana and Shona glosses.

- d. *fər-də suro fato-be-lan culuwo*
 horse-the inside house-GEN-So 3S.left
 'the horse left the house'
 'the horse went out from inside the house'

2.4. Niger Kordofanian. As with other phyla in Africa, Niger-Kordofanian displays a propensity to compress Motion+Direction in verbs expressing basic motion events. In Yoruba [Abraham 1962], we find *wɔ* 'to enter', *koja* 'to traverse, pass by', *goke* 'to ascend', and *dabu* 'to cross'; in Igbo [Uwalaka 1988, Welmers and Welmers 1968] *bhara* 'to enter', *furu* 'to exit', and *shi* 'to move through'; in Kana [Ikoro 1996] *yii* 'to enter' and *siraa-ke* 'to descend'; and in Fula [De Wolf 1995] *naata* 'to enter', *fe?a* 'to cross', *lasde* 'to circle', and *huula* 'to traverse'.

Analysis of lexicalization patterns in clauses of individual languages highlights more forcefully Niger-Kordofanian's verb-framing character. Supyire, a Gur language of West Africa [Carlson 1994], conveys basic directional motion through verb-framing. In the simple clauses of (11), the verbs *jye* 'enter', *fworo* 'exit', *dugo* 'ascend', and *jyiile* 'cross' conflate Motion+Direction. Moreover, the orientation function of accompanying adpositions is evident in (11a) and (11b), where *e* 'inside' occurs with the contrasting directions of *jye* 'enter' and *fworo* 'exit'.

- (11) a. *u a jye ba-ge e*
 3S PRF enter house-the inside
 's/he entered the house'
- b. *u a fworo ba-ge e*
 3S PRF exit house-the inside
 's/he exited the house'
- c. *u a dugo nyang-ke na*
 3S PRF ascend hill-the LOC
 's/he climbed up the hill'
- d. *u a ba-nyi jyiile*
 3S PRF river-the cross
 's/he crossed the river'

Basic directional motion events in Emai, an Edoid language of West Africa [Schaefer 1987], reflect verb-framing. In (12) the main clause verb consistently packages the components Motion+Direction. Included among Emai's Motion+

Direction verbs are *o* ‘enter’, *shoo re* ‘exit’, *lagaa* ‘circle’, and *heen* ‘ascend.’⁷ Since two of these verbs with contrasting directions, *o* ‘enter’ and *shoo re* ‘exit’, require the locative adposition *vbi*, the latter’s orientation rather than directional function becomes evident.

12. a. *ólí ómqhe ó vbi iwe*
 the man enter LOC house
 ‘the man entered the house’
- b. *ólí ómqhe shóó vbi iwe ré*
 the man exit LOC house DIS
 ‘the man exited the house’
- c. *ólí ómq o ó láгаа óli iwe*
 the child SC CONT circle the house
 ‘the child is circling the house’
- d. *ólí ómqhe héén ólí ókoó*
 the man ascend the hill
 ‘the man ascended the hill’

Tswana, a Bantu language of southern Africa [Cole 1955, Schaefer 1985], is also verb-framing with respect to basic directional events. As indicated by the stems *-tsen-* ‘enter’, *-tsw-* ‘exit’, and *-potolog-* ‘circle’ in (13), the two components Motion and Direction fuse in Tswana verbs.

- (13) a. *mò-símàné ó-tsén-à mó-tlù-ng*
 1-boy he-enter-IMP inside-house-LOC
 ‘the boy is entering the house’
- b. *mò-símàné ó-tsw-à mó-tlù-ng*
 1-boy he-exit-IMP inside-house-LOC
 ‘the boy is leaving the house’
- c. *mò-símàné ó-pótólòg-à pètsè*
 1-boy he-circle-IMP well
 ‘the boy is circling the well’

⁷ Orthographic conventions for Emai follow Schaefer [1987], where “e” represents a half-open front vowel, “o” a half-open back vowel, “vb” a voiced bilabial approximant. High tone is marked with an acute accent; low tone is unmarked.

A final Bantu language, Shona [Fortune 1955], also utilizes verb-framing. To encode basic motion events, it melts Motion and Direction into a single verb, as indicated by the stems *-pinda-* ‘enter’, *-poterer-* ‘circle’, and *-darik-* ‘cross’.

- (14) a. *mu-ana u-aka-pinda mumba*
 1-child 1-PST-enter room
 ‘the child entered the room’
- b. *mu-ana u-aka-poterera tafura*
 1-child 1-PST-circle table
 ‘the child circled the table’
- c. *mu-rume u-aka-darika musha*
 1-man 1-PST-cross kraal
 ‘the man crossed the kraal’

3. Manner of Directional Motion

Our preliminary analysis of how African languages encode manner of directional motion uncovers three major tendencies. First, African languages hold to a verb-framing strategy for Direction; they continue to lexicalize Motion+Direction. Second, they convey the component Manner through a verb form separate from Motion+Direction. And third, African languages in our sample register the linear order of their Motion+Direction and Manner verbs through either of two strategies. Manner precedes Motion+Direction when the two verbs are expressed by serial verb sequences, verb compounding, or verb coordination:

[Manner] [Motion+Direction].

Manner follows Motion+Direction when the former occurs as a deranked verbal form, i.e., as a gerundive, or in a deranked clause, i.e., in a subordinate or dependent clause:

[Motion+Direction] [Manner].

We turn now to the lexical partitioning of these semantic components in each of Africa’s four language phyla.

3.1. Afro-Asiatic. We continue to examine Hausa as representative of Afro-Asiatic. While Hausa retains Motion+Direction packaging for manner of motion events, it syntactically expresses Manner in either of two structures. Manner verbs surface in a nominalized form as object of an adposition or as a predicative linked to BE in subordinate circumstantial clauses.

Hausa's intransitive Manner verbs reflect both strategies. In one, an adposition phrase accepts a nominalized form of the Manner verb, while the main clause verb continues to incorporate Motion+Direction. The nominalized verb forms *guje* 'a run', *gudu* 'running', *rarrafee* 'a-crawl', *sukwane* 'a-gallop', and *sukuwaa* 'galloping' in (15) serve as objects of the prepositions *a* 'at' or *da* 'with.' Each conveys Manner from its deranked position, whereas the verbs *shiga* 'enter', *zagay* 'circle', *fit*a 'exit', and *hau* 'ascend' continue to specify Motion+Direction.

- (15) a. *yaarò yaa shìga ðaakii à gùje*
 boy he entered room at a-run
 'the boy entered the room at a run'
 'the boy ran into the room'
- b. *yaarò yaa shìga ðaakii dà gudùu*
 boy he entered room with running
 'the boy entered the room running'
 'the boy ran into the room'
- c. *yaarò yaa zaagàyà wutaa à ràrràfe*
 boy he circle fire at a-crawl
 'the child circled the fire at a crawl'
 'the child crawled around the fire'
- d. *yaarò yaa zaagàyà wutaa dà ràrràfee*
 boy he circle fire with crawling
 'the child circled the fire crawling'
 'the child crawled around the fire'
- e. *dookii yaa fita ðagà shingee à sùkwàane*
 horse-the he exited from corral at a-gallop
 'the horse left the corral at a gallop'
 'the horse galloped out of the corral'
- f. *dookii yaa fita ðagà shingee dà sukùwaa*
 horse-the he exited from corral with galloping
 'the horse left the corral galloping'
 'the horse galloped out of the corral'
- g. *bàreewâ-r taa hau tsaunì à gùje*
 gazelle-the she ascended hill at a-run
 'the gazelle ascended the hill at a run'
 'the gazelle ran up the hill'

- h. *bàreewâ-r taa hau tsaunì dà gudùu*
 gazelle-the she ascended hill with running
 ‘the gazelle ascended the hill running’
 ‘the gazelle ran up the hill’

As part of a second strategy, intransitive Manner verbs are expressed through clause-level deranking. While the main clause verb *keewayà* ‘circle’ in (16) conflates Motion+Direction, the nominalized Manner verb *rarràfee* ‘crawling’ occurs in a circumstantial BE clause.

- (16) *yaarò yaa keewà yaa wutaa yanàa rarràfee*
 boy he circled fire he-was crawling
 ‘the boy circled the fire while he was crawling’
 ‘the boy crawled around the fire’

Structures realized by either of these strategies never locate Manner in the main clause verb. In (17a) and (17b), *rarràfee* ‘crawl’ appears as a main clause verb, and *keewaye* and *zagay*, incorporating Motion+Direction, occur as deranked verbs in a circumstantial clause and an adposition phrase, respectively. Neither is grammatical. Intransitive Manner verbs never precede Motion+Direction verbs in Hausa under conditions of clausal or phrasal deranking.

- (17) a. **yaarò yaa yi rarràfee yanàa keewàyè wutaa*
 boy he did crawl he-was circling fire
 ‘the boy crawled while he was circling the fire’
 ‘the boy crawled around the fire’
- b. **yaarò yaa rarràfee dà zaagàyà wutaa*
 boy he crawl with circling fire
 ‘the boy crawled circling the fire’
 ‘the boy crawled around the fire’

Transitive verbs in Hausa utilize only a single strategy for manner of directional motion. While the main clause verb incorporates Motion+Direction, *zaagaya* ‘circle’ and *hau* ‘climb’ in (18a) and (18b), a circumstantial clause containing the verb *jan* ‘pull’ specifies Manner. Constructions of this type never exhibit the converse order with respect to their predicates. The Manner verb *jaa* ‘pull’ does not appear in the main clause, and the Motion+Direction verbs *zaagaa* ‘circle’ and *hawan* ‘climb’ fail to occur in a deranked circumstantial clause. Again, Manner never precedes Motion+Direction under Hausa’s clausal deranking condition (19).

- (18) a. *mùtumìn yaa zaagàyà wutaa yanàa jân naamàa*
 man-the he circled fire he-was pulling meat
 ‘the man circled the fire while he was dragging the meat’
 ‘the man dragged the meat around the fire’
- b. *mahàdbii yaa hau tsaunìi yanàa jân muushèe*
 hunter he climbed hill he-was pulling carion
 ‘the hunter climbed the hill while he was dragging the carcass’
 ‘the hunter dragged the carcass up the hill’
- (19) a. **mùtumìn yaa jaa naamàa yanàa zaagàyà wutaa*
 man-the he pulled meat he-was circling fire
 ‘the man dragged the meat while he was circling the fire’
 ‘the man dragged the meat around the fire’
- b. **mahàdbii yaa jaa muushèe yanàa hawan tsaunìi*
 hunter he pulled carion he-was climbing hill
 ‘the hunter dragged the carcass up the hill’
 ‘the hunter dragged the carcass while he was climbing the hill’

A far less frequent Hausa lexicalization pattern occurs in constructions where a noun form appears to convey Direction. In (20a) and (20b), a transitive and an intransitive manner verb appear with the spatial relation noun *cikin* ‘inside’ or ‘belly’. This pattern, being confined to *cikin*, displays extremely limited distribution. It may be that constructions with *cikin* convey Direction only via implication, the non-directional relation between a moving entity and a locative reference point being re-interpreted by contextual implicature as directional. Nonetheless, Hausa’s overall pattern for expressing manner of directional motion combines verb-framing of Motion+Direction with deranking of Manner under a condition of strict linear precedence.

- (20) a. *mùtumìn yaa tuurà amalanke cikin garkaa*
 man.the he pushed wagon inside field
 ‘the man pushed the wagon into the field’
- b. *yaarò yaa ruugàa cikin òaakii*
 boy he run inside room
 ‘the boy ran into the room’
 ‘the boy ran inside the house’

3.2. Khoisan. Manner of motion events are linguistically structured in the Khoisan language !Xûu [Snyman 1970] by a strategy which retains verb framing. !Xûu links Motion+Direction to Manner by means of verb coordination or verb compounding. Verbs are not deranked one to another. Instead, the coordinator *te* 'and' is positioned between a Manner verb and a Motion+Direction verb. In (21), the intransitive verb *!aa* 'run', conveying Manner, stands coordinate with either of the Motion+Direction verbs *g!a?ama* 'enter', *!hamm* 'circle', *g!ai* 'exit', or *≠xuru* 'ascend.'

- (21) a. *!hoama kaa !aa te g!a?ama tš'u!ho*
 boy the run and enter kraal
 'the boy ran into the kraal'
- b. *da?ama kaa !aa te !hamm da?a*
 child the run and circle fire
 'the child ran and circled the fire'
 'the child ran around the fire'
- c. *!oe kaa !aa te g!ai tš'u!ho*
 horse the run and exit kraal
 'the horse galloped and left the kraal'
 'the horse galloped out of the kraal'
- d. *!haa kaa !aa te ≠xuru n!um*
 antelope the run and ascend hill
 'the antelope ran and ascended the hill'
 'the antelope ran up the hill'

With transitive Manner verbs, !Xûu continues this strategy. Conjoined by *te*, transitive Manner verbs and their direct objects assume positions coordinate with Motion+Direction verbs. In (22), transitive *!hai* 'drag', *!amm* 'push', and *!aa* 'carry' are linked by *te* to the Motion+Direction verbs *!hamm* 'circle', *g!a?ama* 'enter', *g!ai* 'exit', and *≠xuru* 'ascend.'

- (22) a. *!hoa kaa !hai !ha te !hamm da?a*
 man the drag meat and circle fire
 'the man dragged the meat and circled the fire'
 'the man dragged the meat around the fire'
- b. *!hoa kaa !amm kuni te g!a?ama tš'u!ho*
 man the push wagon and enter kraal
 'the man pushed the wagon and entered the kraal'
 'the man pushed the wagon into the kraal'

- c. *dshau kaa !aa ?msi te g|ai tš'i*
 woman the carry food and exit bush
 'the woman carried the food and left the bush'
 'the woman carried the food out of the bush'
- d. *!aakxa?ao kaa //hai !'haa te #xuru n!um*
 hunter the drag carcass and ascend hill
 'the hunter dragged the carcass and ascended the hill'
 'the hunter dragged the carcass up the hill'

Coordinate structures linking Manner and Motion+Direction verbs in !Xûu observe a relation of strict linear precedence. Manner must precede Motion+Direction. The converse order, transitive or intransitive Manner verb following Motion+Direction verb, is not allowed. In (23a), *g!a?ama* 'enter' precedes *!aa* 'run' and, in (23b), *//hama* 'circle' precedes *//hai* 'drag'. Since both are ungrammatical, !Xûu requires not only equivalent ranking of Manner and Motion+Direction verbs but also strict linear ordering between them.

- (23) a. **!'hoama kaa g!a?ama tš'u' ho te !aa*
 boy the enter kraal and run
 'the body entered the kraal and ran'
 'the boy ran into the kraal'
- b. **!'hoa kaa //hamm da?a te //hai !'ha*
 man the circle fire and drag meat
 'the man circled the fire and dragged the meat'
 'the man dragged the meat around the fire'

3.3. Nilo-Saharan. Manner of motion in Kanuri of the Nilo-Saharan phylum is expressed by verb coordination [Hutchison 1981, Cyffer 1994]. While retaining verb-framing of Motion+Direction, Kanuri conveys Manner through a second verb. Intransitive Manner verbs are linked to Motion+Direction verbs by the coordinating conjunction -ə 'and'. In (24), intransitive Manner *səgas* 'run' stands conjoined to either of the Motion+Direction verbs *jəwa* 'ascend', *kargawo* 'enter', or *culuwo* 'exit, leave'.

- (24) a. *ngəri-də səgas-ə kawu-ro jəwa*
 gazelle-the 3S.ran-and mountain-Go 3S.ascended
 'the gazelle ran and ascended the mountain'
 'the gazelle ran up the mountain'

- b. *tada-də səgas-ə nyim-ro kargawo*
 child-the 3S.ran-and room-Go 3S.entered
 ‘the child ran and entered the room’
 ‘the child ran into the room’
- c. *fər-də səgas-ə suro fato-be-lan culuwo*
 horse-the 3S.ran-and inside house-GEN-So 3S.left
 ‘the horse ran and left the house’
 ‘the horse ran out from inside the house’

Transitive verbs of Manner participate in a similar configuration. Coordination joins a transitive Manner verb and its accompanying direct object to a Motion+Direction verb and its complement. In (25), *-ə* conjoins, respectively, the Manner verbs *zuz* ‘push’, *goz* ‘take’, and *gərz* ‘drag’ to Motion+Direction *jəwa* ‘ascend’, *kargawo* ‘enter’, and *dəriz* ‘circle’.

- (25) a. *barama-ye tigə ngəri-be-də-ga zuz-ə*
 hunter-NOM body gazelle-GEN-the-ACC 3S.pushed-and

kawu-ro jəwa
 mountain-Go 3S.ascended

 ‘the hunter pushed the gazelle and ascended the mountain’
 ‘the hunter pushed the gazelle up the mountain’
- b. *kam-də-ye babur-də-ga goz-ə suro*
 person-the-NOM motorcycle-the-ACC 3S.took-and inside

mowonti-be-ro kargawo
 school-GEN-Go 3S.entered

 ‘the person brought the motorcycle and entered the school’
 ‘the person brought the motorcycle into the school’
- c. *kam-də-ye da-də-ga gərz-ə kannu-də*
 person-the-NOM meat-the-ACC 3S.dragged-and fire-the

dəriz-ə kəlwono
 3S.circled-and 3S.joined

 ‘the person dragged the meat and circled the fire’
 ‘the person dragged the meat around the fire’

Strict precedence constrains the ordering of Kanuri’s Manner and Motion+Direction verbs. Irrespective of their transitivity, Manner verbs do not follow

Motion+Direction verbs. The coordinating conjunction *-ə*, as demonstrated by the ungrammaticality in (26), never stands between Motion+Direction *jəw* ‘climb, ascend’ and Manner *səgasa* ‘run’, or between *jəw* and Manner *zuz* ‘push’. Hence, expressing manner of motion in Kanuri also demands verbs of equivalent clausal rank in a strict linear order.

- (26) a. **ngəri-də kawu-ro jəw-ə səgasa*
 gazelle-the mountain-Go 3S.climbed-and 3S.ran
 ‘the gazelle climbed the mountain and ran’
 ‘the gazelle ran up the mountain’
- b. **barama-ye kawu-ro jəw-ə tigə*
 hunter-NOM mountain-Go 3S.climbed-and body
- ngəri-be-də-ga zuz-ə*
 gazelle-GEN-the-ACC 3S.pushed-and
 ‘the hunter climbed the mountain and pushed the gazelle’
 ‘the hunter pushed the gazelle up the mountain’

3.4. Niger-Kordofanian. Compared to other phyla in Africa, Niger-Kordofanian expresses manner of directional motion through a wider variety of syntactic strategies. It does so while retaining verb-framing for Direction. Analysis of languages such as Supyire, Emai, Tswana, and Shona reveals how Manner links to Motion+Direction through coordination, serialization, or clause level deranking.

The Gur language Supyire conveys manner of motion events via verb coordination. Manner and Motion+Direction verbs are ranked in a main clause as coordinate by a ‘and’. The intransitive Manner verbs *nya* ‘swim’ and *fe* ‘run’ in (27) stand coordinate with the Motion+Direction verbs *jyille* ‘cross’, *jye* ‘enter’, or *dugo* ‘ascend’.

- (27) a. *u a nya a ba-nyi jyille*
 3S PRF swim and river-the cross
 ‘s/he swam and crossed the river’
 ‘s/he swam across the river’
- b. *u a fe a jye ba-ge e*
 3S PRF run and enter house-the inside
 ‘s/he ran and entered the house’ / ‘s/he ran into the house’
- c. *u a fe a dugo nyang-ke na*
 3S PRF run and ascend hill-the LOC
 ‘s/he ran and ascended the hill’
 ‘s/he ran up the hill’

Similarly, the transitive Manner verbs *ngoonga* ‘push’, *filila* ‘drag’, and *dira* ‘pull’ in (28) link via the coordinator *a* to the Motion+Direction verbs *jiiile* ‘cross’, *dugo* ‘ascend’, and *fworo* ‘exit’, respectively.

- (28) a. *u a ku ngoonga a ba-nyi jiiile*
 3S PRF it push and river-the cross
 ‘s/he pushed it and crossed the river’
 ‘s/he pushed it across the river’
- b. *u a ku filila a dugo nyang-ke na*
 3S PRF it drag and ascend hill-the LOC
 ‘s/he dragged it and ascended the hill’
 ‘s/he dragged it up the hill’
- c. *u a ku dira a fworo ba-ge e*
 3S PRF it pull and exit house-the inside
 ‘s/he pulled it and left the house’
 ‘s/he pulled it out of the house’

Verb coordination in Supyire appears to be controlled by strict linear precedence. It is ungrammatical, as shown in (29), for intransitive Manner *nya* ‘swim’ or transitive Manner *ngoonga* ‘push’ to follow Motion+Direction *jiiile* ‘cross’ and the coordinator *a* ‘and’. Supyire’s structuring of manner of motion therefore demands verbs of coordinate rank in strict linear order.

- (29) a. **u a ba-nyi jiiile a nya*
 3S PRF river-the cross and swim
 ‘s/he crossed the river and swam’
 ‘s/he swam across the river’
- b. **u a ba-nyi jiiile a ku ngoonga*
 3S PRF river-the cross and it push
 ‘s/he crossed the river and pushed it’
 ‘s/he pushed it across the river’

A syntactically distinct strategy for encoding manner of motion is employed by the Edoid language Emai [Schaefer 1987]. As with other Niger-Kordofanian languages, it retains verb-framing for lexicalizing Direction. To link Motion+Direction and Manner verbs, Emai employs verb serialization which, unlike verb coordination, lacks overt morphological marking of rank. Verb serialization affects both transitive and intransitive manner verbs. Intransitive Manner *la* ‘run’ in (30) occurs in series with Motion+Direction *o* ‘enter’, *lagaa* ‘circle’, or *heen* ‘ascend’.

- (30) a. *ólí ómọ́hẹ lá ó vbi iwe*
 the man run enter LOC house
 ‘the man ran into the house’
- b. *ólí ómọ́ ọ ọ lá lágaa óli iwe*
 the child SC CONT run circle the house
 ‘the child is running around the house’
- c. *ólí ómọ́hẹ lá héén ólí ókọ́*
 the man run ascend the hill
 ‘the man ran up the hill’

Similar structures are found with transitive Manner verbs. The verb *sua* ‘push’ and its direct object in (31) appear in series with Motion+Direction *o* ‘enter’, *lagaa* ‘circle’ or *heén* ‘ascend’.

- (31) a. *ólí ómọ́hẹ súá óli ẹkpete ó vbi ẹkọ́a*
 the man push the stool enter LOC room
 ‘the man pushed the stool into the room’
- b. *ólí ómọ́hẹ ọ ọ sua imátó lágaa óli iwe*
 the man SC CONT push car circle the house
 ‘the man is pushing the car around the house’
- c. *ólí ómọ́hẹ súá óli ẹkpete héén ólí ókọ́*
 the man push the stool ascend the hill
 ‘the man pushed the stool up the hill’

Serialization, too, imposes a strict order condition on Emai verbs. When encoding a single motion event, it is never possible for either of the Manner verbs *la* ‘run’ or *sua* ‘push’ to follow the Motion+Direction verb *o* ‘enter’ (32). Thus, Emai’s serial verbs are characterized by equivalent rank in a coordinate structure and strict linear ordering.

- (32) a. **ólí ómọ́hẹ ó vbi iwe lá*
 the man enter LOC house run
 ‘the man ran into the house’
- b. **ólí ómọ́hẹ ó vbi ẹkọ́a súá óli ẹkpete*
 the man enter LOC room push the stool
 ‘the man pushed the stool into the room’

The Bantu language Tswana, in contrast, conveys manner of directional motion with clause level deranking. While holding to verb-framing for expressing Direction, Tswana relies almost exclusively on a multi-clause structure in which a deranked verb lexicalizes Manner and a main clause verb Motion+Direction. The intransitive Manner stem *-tabog-* ‘run’, for example, appears in a circumstantial or participial clause following either of the Motion+Direction stems *-tsw-* ‘exit’ or *-potolog-* ‘circle’. Deranking is signaled in part by a difference in subject concord prefixes, third person singular in circumstantial clauses being designated by *a-* and in main clauses by *o-*.

- (33) a. *mò-símàné ó-tsw-à mó-tlù-ng á-tábóg-à*
 1-boy he-exit-IMP inside-house-LOC he-run-IMP
 ‘the boy is exiting the house while he is running’
 ‘the boy is running out of the house’
- b. *mò-símàné ó-pótólòg-à pètsè á-tábóg-à*
 1-boy he-circle-IMP well he-run-IMP
 ‘the boy is circling the well while he is running’
 ‘the boy is running around the well’

In like manner, the transitive Manner stem *-gog-* ‘pull’ and its direct object occur in a circumstantial/participial clause following either of the Motion+Direction stems *-tsw-* ‘exit’ or *-potolog-* ‘circle.’

- (34) a. *mò-símàné ó-tsw-à mó-lè-sàké-ng á-góg-á kòlói*
 1-boy he-exit-IMP in-5-kraal-LOC he-pull-IMP cart
 ‘the boy is exiting the kraal while he is pulling a cart’
 ‘the boy is pulling a cart out of the kraal’
- b. *mò-símàné ó-pótólòg-à pètsè á-góg-á kòlói*
 1-boy he-circle-IMP well he-pull-IMP cart
 ‘the boy is circling the well while he is pulling a cart’
 ‘the boy is pulling a cart around the well’

Tswana manner of motion constructions impose strict ordering on their verbs. It is unacceptable, as indicated in (35), for the Manner stem *-tabog-* ‘run’ or *-gog-* ‘pull’ in a main clause to precede a Motion+Direction stem like *-tsw-* ‘exit’ in a circumstantial clause. Tswana thus deranks Manner verbs and strictly orders them after a Motion+Direction verb.

- (35) a. **mò-símàné ó-tábóg-à á-tsw-à mó-tlù-ng*
 1-boy he-run-IMP he-move out-IMP inside-house-LOC
 ‘the boy is running out of the house’

- b. **mò-símàné ó-góg-á kòlói á-tsw-à mó-lè-sàké-ng*
 1-boy he-pull-IMP cart he-moveout-IMP in-5-kraal-LOC
 ‘the boy is pulling a cart out of the kraal’

Also available in Tswana is an alternative lexicalization for one directional type [Cole 1955]. It pertains to the Direction ‘into’. Verb stems like *-tabog-* ‘run’ and *-gog-* ‘pull’, but only when joined by the Direction conveying Applicative suffix *-èl-*, conflate Manner+Motion (36). Since such constructions are limited to a single direction, Tswana’s typical lexicalization pattern remains verb-framing with respect to Direction in the main clause and verb deranking of Manner in a subordinate clause.

- (36) a. *mò-símàné ó-tábóg-èl-à mó-tlù-ng*
 1-boy he-run-APP-IMP inside-house-LOC
 ‘the boy is running into the house’
- b. *mò-símàné ó-góg-èl-á kòlói mó-kàgò-ng*
 1-boy he-pull-APP-IMP cart inside-building-LOC
 ‘the boy is pulling a cart into the building’

A variation of the Tswana pattern for encoding manner of motion is evident in the Bantu language Shona [Fortune 1955]. It employs clause level deranking but fails to observe strict linear precedence. Despite this, it still holds to verb-framing for Direction. Shona allows a multi-clause structure in which a Manner verb occurs either deranked in a circumstantial/participial clause or ranked in a main clause. The intransitive Manner stem *-mhany-* ‘run’ reveals these distributional options in multi-clause structures with the Motion+Direction stems *-pind-* ‘enter’ and *-poterer-* ‘circle’. Manner conveying *-mhany-* can be found in a participial clause marked by *-chi-* (PRT), which follows a main clause defined by *-pind-* (37a) or *-poterer-* (37c). And *-mhany-* can occur in a main clause preceding a *-chi-* marked participial clause containing *-pind-* (37b) or *-poterer-* (37d).

- (37) a. *mu-ana u-aka-pinda mumba a-chi-mhanya-a*
 1-child 1-PST-enter room 1-PRT-run
 ‘the child ran into the room’
 ‘the child entered the room while he ran’
- b. *mu-ana u-aka-mhanya a-chi-pinda mumba*
 1-child 1-PST-run 1-PRT-enter room
 ‘the child ran into the room’
 ‘the child ran while he entered the room’

- c. *mu-ana u-aka-poterera tafura a-chi-mhanya*
 1-child 1-PST-circle table 1-PRT-run
 ‘the child ran around the table’
 ‘the child circled the table while he ran’
- d. *mu-ana u-aka-mhanya a-chi-poterera tafura*
 1-child 1-PST-run 1-PRT-circle table
 ‘the child ran around the table’
 ‘the child ran while he circled the table’

Shona’s transitive Manner stems, such as *-kwev-* ‘drag’, manifest comparable behavior. As verb of a *-chi-* marked participial clause, *-kwev-* follows a Motion+Direction main clause verb, *-pind-* ‘enter’, in (38a) and *-tenderer-* ‘circle’ in (38c). As a main clause verb, *-kwev-* precedes the participial clause Motion+Direction verbs *-pind-* in (38b) and *-tenderer-* in (38d).

- (38) a. *mu-rume u-aka-pinda mumba a-chi-kweva chitunha*
 1-man 1-PST-enter room 1-PRT-drag carcass
 ‘the man dragged the carcass into the room’
 ‘the man entered the room while he dragged the carcass’
- b. *mu-rume u-aka-kweva chitunha a-chi-pinda mumba*
 1-man 1-PST-drag carcass 1-PRT-enter room
 ‘the man dragged the carcass into the room’
 ‘the man dragged the carcass while he entered the room’
- c. *mu-rume u-aka-tenderera tsime a-chi-kweva chitunha*
 1-man 1-PST-circle well 1-PRT-drag carcass
 ‘the man dragged the carcass around the well’
 ‘the man circled the well while he dragged the carcass’
- d. *mu-rume u-aka-kweva chitunha a-chi-tenderera tsime*
 1-man 1-PST-drag carcass 1-PRT-circle well
 ‘the man dragged the carcass around the well’
 ‘the man dragged the carcass while he circled the well’

Shona presents the option of conflating Manner and Motion in the stems *-mhany-* ‘run’ and *-kwev-* ‘drag’, (39), but only so long as the Applicative suffix *-er-* is present to convey Direction. Since patterns of this type are limited to the Direction ‘into’, Shona’s principal strategy for encoding manner of motion deranks either a Manner or Motion+Direction verb without strictly ordering them.

- (39) a. *mu-ana u-aka-mhany-era mumba*
 1-child 1-PST-run-APP room
 ‘the child ran into the room’
- b. **mu-ana u-aka-mhanya mumba*
 1-child 1-PST-run room
- c. *mu-rume u-aka-kwev-era chitunha mumba*
 1-man 1-PST-drag-APP carcass room
 ‘the man dragged the carcass into the room’
- d. *mu-rume u-aka-kwev-era mumba chitunha*
 1-man 1-PST-drag-APP room carcass
 ‘the man dragged into the room the carcass’
- e. **mu-rume u-aka-kweva chitunha mumba*
 1-man 1-PST-drag carcass room

Shona exhibits still another strategy for expressing Manner, Motion, and Direction, although not as elements of a single event. In construction with the consecutive morpheme *-ka-* (CONS), a Manner verb and a Motion+Direction verb appear in separate clauses referring to distinct events. The Manner stems *-mhany-* ‘run’ and *-kwev-* ‘drag’ stand in a consecutive relation to the Motion+Direction stem *-pind-* ‘enter’ in (40). Either verb type, as comparison of (40a) with (40b) and (40c) with (40d) attests, is found in a *-ka-* marked consecutive clause.

- (40) a. *chi-komana chi-aka-mhanya chi-ka-pinda mumba*
 7-boy 7-PST-run 7-CONS-enter room
 ‘the boy ran and then he entered the room’
 *‘the boy ran into the house’
- b. *chi-komana chi-aka-pinda mumba chi-ka-mhanya*
 7-boy 7-PST-enter room 7-CONS-run
 ‘the boy entered the room and then he ran’
 *‘the boy ran and then he entered the room’
- c. *mu-rume u-aka-kweva chitunha a-ka-pinda mumba*
 1-man 1-PST-drag carcass 1-CONS-enter room
 ‘the man dragged the carcass and then he entered the room’
 *‘the man dragged the carcass into the room’

- d. *mu-rume u-aka-pinda mumba a-ka-kweva chitunha*
 1-man 1-PST-enter room 1-CONS-drag carcass
 'the man entered the room and then he dragged the carcass'
 *'the man dragged the carcass into the room'

4. Discussion

In this paper we have reviewed the lexical and syntactic coding of directional motion events in each of the four language phyla of Africa. We uncovered a relatively consistent lexicalization of basic directional motion which is maintained under varying syntactic conditions to express manner of directional motion. Although the size of our database is limited, each phylum, Nilo-Saharan, Afro-Asiatic, Khoisan, and Niger-Kordofanian, manifests the incorporation of Motion and Direction in a main clause verb. Each also assigns Manner, when present, to a distinct verb which is ranked as coordinate or is deranked via clause subordination or adposition phrasing. Except in the case of Shona, verb ranking and deranking occur under a condition of strict linear precedence.

With respect to basic directional motion, our primary conclusion is that African languages tend to be verb-framing rather than satellite-framing. In each phylum, conceptual material conveying motion and the direction of motion exhibit a strong propensity for merger in a single verb, i.e., Motion+Direction. Assuming the general validity of this conclusion leads to several questions for which answers are not yet available from very many individual African languages or their respective phyla. For instance, does the Motion+Direction merger hold for every directional type expressing transextensional motion? In the case of Tswana and Emai, transextensional direction types are characteristically verb framed [Schaefer 1985, 1986]. That is, they are colloquial, frequent, and pervasive in the grammatical system [Talmy 1985]. For other languages, it remains to be determined how extensively this merger holds. In this regard, Talmy [1983] postulates several directional configurations as possible universals that might fruitfully be investigated. A second question pertains to the relationship between transextensional and transpositional motion. Do the two rely on the same set of grammatical resources? Is direction conveyed by the same grammatical forms in both domains? If not, where do they differ? Beyond directional types, there is a need to assess the relation of Motion+Direction verbs to deixis. Particularly vexing in this regard is the possible combinatorial potential of Motion+Direction verbs and their deictic motion counterparts comparable to *come* and *go*.

Manner of directional motion expressed through transitive or intransitive verbs yielded several distinct strategies for linking Manner to Motion+Direction. Table I summarizes strategies found in each phylum. It reveals that syntactic arrangement of manner of directional motion across African languages does not tend toward a single pattern of articulation. Khoisan and Nilo-Saharan share a single strategy, verb coordination, which is also found in Niger-Kordofanian but not Afro-Asiatic.

Table I. Distribution of lexicalization types and their linear order for manner of motion events in Khoisan (K), Nilo-Saharan (N-S), Afro-Asiatic (A-A) and Niger-Kordofanian (N-K).

K	[MANNER]	cor	[MOTION+DIRECTION]
N-S	[MANNER]	cor	[MOTION+DIRECTION]
A-A	[MOTION+DIRECTION]	[adp	[MANNER]]
	[MOTION+DIRECTION]	[cir	[MANNER]]
N-K	[MANNER]	cor	[MOTION+DIRECTION]
	[MANNER]	ser	[MOTION+DIRECTION]
	[MOTION+DIRECTION]	[cir	[MANNER]]
	[MANNER]	[cir	[MOTION+DIRECTION]]

Abbreviations designating verb rank: "cor"=coordinate conjunction, "adp"=adposition, "cir"= circumstantial clause, and "ser"=serialization.

Conversely, it is Niger-Kordofanian and Afro-Asiatic which share the circumstantial clause strategy, i.e., clause deranking, not found in Khoisan or Nilo-Saharan. The remaining two strategies, adposition marking, i.e., phrasal deranking of verb forms, and verb serialization, occur only within the phyla Afro-Asiatic and Niger-Kordofanian, respectively.

Additional investigation will be required to detail relations between these ranking and deranking strategies, especially as they occur within a single phylum. It would appear useful, for instance, to examine clause deranking in Niger-Kordofanian as it relates to serialization and coordination. Moreover, the propensity across phyla to constrain the linear ordering of Manner and Motion+Direction verbs according to their ranked or unranked status requires attention. Languages like Shona which appear to disregard this constraint require more intensive analysis.

Future studies of individual languages will also need to determine whether conclusions arising from our initial analysis generalize to all transextensional manner of motion events. In other words, do individual Manner verbs combine with all basic Motion+Direction verbs to express transextensional motion? Do only some combine? If the latter, what grammatical resources are exploited to express directionality? A case in point is the alternative lexicalization for the direction 'into' discovered in Tswana, Shona, and Hausa. Extensive investigation of these

and other questions might profit from our postulate that African languages will tend to fuse Motion and Direction in a verb while expressing Manner separately in a verb of the same or different rank.

As a final note, the results of this investigation bring to light several gaps in our understanding of the motion domain in individual African languages and their respective phyla. Information of the sort required for this study is not easily available in grammars or dictionaries. We hope, therefore, that the tentative, initial nature of this inquiry will spur sustained, intensive analysis of the motion domain in more African languages.

REFERENCES

- Abraham, R.C. 1962. *Dictionary of Modern Yoruba*. London: Hodder Stoughton.
- Carlson, Robert. 1994. *A Grammar of Supyire*. Berlin: Mouton de Gruyter.
- Cole, Desmond T. 1955. *Introduction to Tswana Grammar*. London and Capetown: Longmans.
- Creider, Chet (ed.). 1993. *A Grammar of Kenya Luo (Dholuo)* by A.N. Tucker. Köln: Rüdiger Köppe Verlag.
- Creider, Chet and Jane Tapsubei Creider. 1993. *A Grammar of Nandi*. Hamburg: Buske.
- Cyffer, Norbert. 1994. *English-Kanuri Dictionary*. Köln: Rüdiger Köppe Verlag.
- De Wolf, Paul. 1995. *English-Fula Dictionary*. Berlin: Dietrich Reimer Verlag.
- Dickens, Patrick. 1994. *English-Ju'hoan: Ju'hoan-English Dictionary*. Köln: Rüdiger Köppe Verlag.
- Dimmendaal, Gerrit. 1983. *The Turkana Language*. Dordrecht: Foris.
- Dixon, R.M.W. 1982. *Where Have All The Adjectives Gone?* The Hague: Mouton.
- Fortune, G. 1955. *An Analytical Grammar of Shona*. London and Capetown: Longmans.

- Frajzyngier, Zygmunt. 1987. "Encoding locative in Chadic." *Journal of West African Languages* XVII,1: 81-97.
- Gruber, Jeffrey. 1976. *Lexical Structures in Syntax and Semantics*. Amsterdam: North Holland.
- Hagman, Roy. S. 1977. *Nama Hottentot Grammar*. Bloomington: Indiana University.
- Hutchison, John P. 1981. *The Kanuri Language: A Reference Grammar*. Madison: University of Wisconsin, African Studies Center.
- Ikoru, Suanu. 1996. *The Kana Language*. Leiden: Research School CNNS.
- Jackendoff, Ray. 1983. *Semantics and Cognition*. Cambridge, MA: MIT Press.
- Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge, MA: MIT Press.
- Jakobi, Angelika. 1990. *A Fur Grammar*. Hamburg: Buske.
- Kraft, G.H. and A.H.M. Kirk-Greene. 1973. *Hausa*. London: Hodder and Stoughton.
- Leslau, Wolf. 1973. *English-Amharic Context Dictionary*. Wiesbaden: Harrassowitz.
- Levin, Beth and Malka Rappaport-Hovav. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge, MA: MIT Press.
- Newman, Paul and Roxana Ma Newman. 1977. *Modern Hausa-English Dictionary*. Zaria: Oxford University Press.
- Schaefer, Ronald. 1985. "Motion in Tswana and its characteristic lexicalization." *Studies in African Linguistics* 16,1: 57-87.
- Schaefer, Ronald. 1986. "Lexicalizing directional and nondirectional motion in Emai." *Studies in African Linguistics* 17,2: 177-198.
- Schaefer, Ronald. 1987. *An Initial Lexicon and Orthography for Emai: An Edoid Language of Nigeria*. Bloomington: Indiana University Linguistics Club.

- Shibatani, Masayoshi. 1976. "The grammar of causative constructions: A Conspectus." In M. Shibatani (ed.), *The Grammar of Causative Constructions (Syntax and Semantics Volume 6)*. New York: Academic Press. Pp. 1-40.
- Snyman, Jan. 1970. *An Introduction to the !Xû Language*. Pretoria: Balkema.
- Talmy, Leonard. 1976. "Semantic causative types." In M. Shibatani (ed.), *The Grammar of Causative Constructions (Syntax and Semantics Volume 6)*. New York: Academic Press. Pp. 43-116.
- Talmy, Leonard. 1983. "How language structures space." *Spatial Orientation: Theory, Research and Application*, ed. by Herbert Pick, Jr. and Linda Acredolo. New York: Plenum Press. Pp. 225-282.
- Talmy, Leonard. 1985. "Lexicalization patterns: Semantic structure in lexical forms." *Language Typology and Syntactic Description: Grammatical Categories and the Lexicon*, ed. by T. Shopen. New York: Cambridge University Press. Pp. 57-149.
- Talmy, Leonard. 1991. "Path to realization: A typology of event integration." *Proceedings of the Berkeley Linguistic Society* 17: 480-519. Berkeley: University of California at Berkeley.
- Traill, Anthony. 1994. *A !Xóǒ Dictionary*. Köln: Rüdiger Köppe Verlag.
- Uwalaka, M.A.A.N. 1988. *The Igbo Verb*. Wien: Beiträge zur Afrikanistik.
- Wehr, Hans. 1979. *A Dictionary of Modern Written Arabic* (4th ed.). Edited by J. Milton Cowan. Wiesbaden: Harrassowitz.
- Welmers, Beatrice and William Welmers. 1968. *Igbo: A Learner's Dictionary*. Los Angeles: African Studies Center, University of California.

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Newman, Paul. *Hausa and the Chadic Language Family: A Bibliography*. African Linguistic Bibliographies 6. Köln: Rüdiger Köppe Verlag. 1996. Pp. xx, 152.

This is a comprehensive bibliography of publications on Hausa linguistics and of all published documentation of languages of the Chadic languages other than Hausa. (Not included are non-linguistic works written in Hausa and works on Hausa literature. Graham Furniss's *Poetry, Prose and popular Culture in Hausa*, mentioned elsewhere in these book notices, has an extensive bibliography of such works.) The Hausa and Chadic bibliography has three main sections: (1) a list of 26 of the major published collections on Hausa and Chadic; (2) a list of somewhat over 1,000 works specifically on the Hausa language (the list is numbered 1-999, but has a number of inclusions such as "115a" which were added after the first 999 entries were complete); (3) a list of about 830 works on Chadic languages other than Hausa. The volume concludes with a list of 115 Chadic languages (excluding alternate names for the same language) and the bibliographic entries in which information on those with individual papers from those collections appearing in lists (2, 3). The entries in lists (2, 3) are numbered consecutively as 1-1821 and all cross-referencing is to those numbers. Reviews of book-length works are not given as separate entries, but are gathered in a list together with the work reviewed. A notation "REV" is given under the names of review authors, with numerical reference to the work reviewed. The bibliography includes lists of obituaries and the authors of obituaries for the four preeminent figures of Hausa and Chadic linguistics who are no longer living: R. C. Abrams, G. P. Bargery, Johannes Lukas, and F. W. Parsons. In the introduction, Newman notes that he compiled this bibliography using the bibliographic database program EndNote™ (Niles & Associates) and that he can provide the bibliography in this electronic format. [Russell G. Schuh, UCLA]

Furniss, Graham. *Poetry, Prose and Popular Culture in Hausa*. Washington, D.C.: Smithsonian Institution Press. 1996. Pp. xiv, 338.

This is the most comprehensive book yet written on Hausa literature. It includes discussion of published prose writing, a variety of oral "prose" genres, oral poetry/song, and written poetry. A distinctive and important part of the literary and cultural analysis is extensive reference to work written in Hausa by Hausa scholars, much of it unpublished or otherwise unavailable to outside the institutions where it was written. The notice on the back cover of the book provides a good summary of its content: "Focusing on literature from the Hausa speaking 'heartlands' in northern Nigeria, Graham Furniss analyzes a range of works—from the first Hausa novels written in the 1930s to novels that examine contemporary social issues such as love, education and women's roles in Hausa society; from traditional poetry to modern poetry and song; from community theater productions to mimetic commemorations of events on the Hausa calendar. While the book places the development of each genre in its own historical context, it emphasizes the dynamic interrelations among the various expressive forms, showing how the Hausa reinvent tradition and reconstruct culture through genre relationships. The complexities of modern patterns of social status and the emergence of new groups and classes within Nigerian society are also discussed within literary genres. The book provides an extensive bibliography of sources

published in English, European languages, and in Hausa, as well as an index of published [the notice mistakenly says 'unpublished'] literature." [Russell G. Schuh, UCLA]

Winkler, Elizabeth Grace. *Kpelle-English Dictionary with English-Kpelle Glossary*. Bloomington, IN: Indiana University Linguistics Club. 1997. Pp. xxii, 101.

This dictionary, the culmination of four years of data collection, grew out of the author's work begun in a field methods class in 1993. Clara Jimmy-Samba, from Bong County, Liberia, served as the informant and assisted with the dictionary. Introductory matter provides background information on the location and classification of Kpelle as well as a sketch of the sound system and major grammatical categories. The Kpelle-English section provides a brief guide to using the dictionary, which contains approximately 1,000 Kpelle head entries. The English-Kpelle glossary contains approximately 1,100 English head entries.

Niang, Mamadou Ousmane. *Constraints on Pulaar Phonology*. Lanham, MD, New York, London: University Press of America. 1997. Pp. xiv, 156. \$34.50 (cloth)

The focus of this book is the metrical structure of Pulaar (West Atlantic, Niger-Congo), spoken in Mauritania, Senegal, The Gambia, Mali, and Guinea. The author adopts the theoretical framework set forth by Halle and Vergnaud (1987) in "An essay on stress". Although this framework assumes a binary opposition in syllable weight, the author presents evidence that Pulaar makes a four-way distinction in which stress assignment is sensitive to a syllable "sonority" hierarchy, in which there are four levels: CV < CVC < CVV < CVVC. In addition to description and analysis of the metrical structure, the study also describes and analyzes syllable structure and gemination in the language. The book is organized into four chapters. The first chapter sets out Halle and Vergnaud's theoretical framework as well as providing background information on the language. The second chapter describes constraints on syllable structure, the third constraints on gemination. The final chapter discusses previous approaches to metrical structure in Pulaar and presents the author's analysis. Back matter to the book includes a glossary of approximately 700 Pulaar-English entries, references, and an index.

UPCOMING MEETINGS
ON AFRICAN LANGUAGES/LINGUISTICS

1997

December 12-17

INTERNATIONAL CONFERENCE OF ETHIOPIAN STUDIES, XIIITH. Hotel Sunflower
Kyoto, Kyoto, Japan. (Contact: ICES Project Office, c/o Katsuyoshi Fukui,
Faculty of Integrated Human Studies, Kyoto University, Sakyo, Kyoto 606-
01, Japan. Fax: +81-75-753-6615; e-mail: [ethiopia@jambo.africa.kyoto-
u.ac.jp](mailto:ethiopia@jambo.africa.kyoto-u.ac.jp))

1998

March 6-8

ARABIC LINGUISTICS SYMPOSIUM, 12TH. University of Illinois, Champaign,
Illinois. (Contact Tessa Hauglid, 759 W. 1800 N. West Bountiful, UT
84087; Tel. 801-298-3621; e-mail: tessa.hauglid@m.cc.utah.edu)

March 26-29

ANNUAL CONFERENCE ON AFRICAN LINGUISTICS (ACAL), 29TH. Yale
University, New Haven, Connecticut. (Contact Anna Perry, ACAL,
Council on African Studies, P. O. Box 208206, Yale University, New
Haven, CT 06520; Tel. 203-432-3436; Fax: 203-432-5963; e-mail:
african.studies@qm.yale.edu)

March 29 - April 2

ASSOCIATION INTERNATIONALE DE DIALECTOLOGIE ARABE, 3RD (AIDA). Malta
(Contact: Manual Mifsud, Old Humanities Building, Room 353, University
of Malta, Msida MSD 06, Malta. Fax: 356-345-655; e-mail: [mmfisud@
waldonet.net.mt](mailto:mmfisud@waldonet.net.mt))

April 2-4

NORTH AMERICAN CONFERENCE ON AFROASIATIC LINGUISTICS, 26TH. New Orleans, Louisiana (American Oriental Society) (Contact M. Lionel Bender, Department of Foreign Languages, Southern Illinois University, Carbondale, IL 62901; Tel. 618-453-5428; Fax: 618-453-3253; e-mail: NACAL26@siu.edu)

May 14-16

STABILIZING INDIGENOUS LANGUAGES, 5TH. Louisville, KY. (Contact: Robert N. St. Clair, Dept. of English, University of Louisville, Louisville, KY 40292; e-mail: mstc101@ulkyvm.louisville.edu.com.)

June 16-19

LANGUAGE, LITERATURE AND SOCIETY: PARADIGMS AND PEDAGOGIES, TRIBUTE TO BESSIE HEAD. Department of English, University of Botswana at Gaborone, Botswana. (Contact: Ms. Nono Kgafela, Dept. of English, University of Botswana, Private Bag 0022, Gaborone, Botswana; Fax (267) 3552279; e-mail: kgafelak@noka.ub.bw or molemals@noka.ub.bw.)

August 31 - September 2

COLLOQUIUM ON AFRICAN LANGUAGES AND LINGUISTICS, 28TH. Leiden, The Netherlands. (Contact: The Organizers, CALL 28, Afrikanse Taalkunde, Rijksuniversiteit to Leiden, P.O. Box 9515, 2300 RA Leiden, The Netherlands. Tel: 00-31-71-527-2245; Fax: 00-31-71-527-2615; e-mail: heynders@Rullet.LeidenUniv.nl.)

September 2-6

INTERNATIONAL CONFERENCE ON NILO-SAHARAN LINGUISTICS, 7TH. Department of African Studies, Institut für Afrikanistik, Vienna, Austria. (Contact 7th Nilo-Saharan Linguistics Conference, Institut für Afrikanistik, Universität Wien, Doblhoffgasse 5/9, A-1010 Vienna, Austria. Tel: +43-1-4052273; Fax: +43-1-405227319; e-mail: norbert.cyffer@univie.ac.at)

