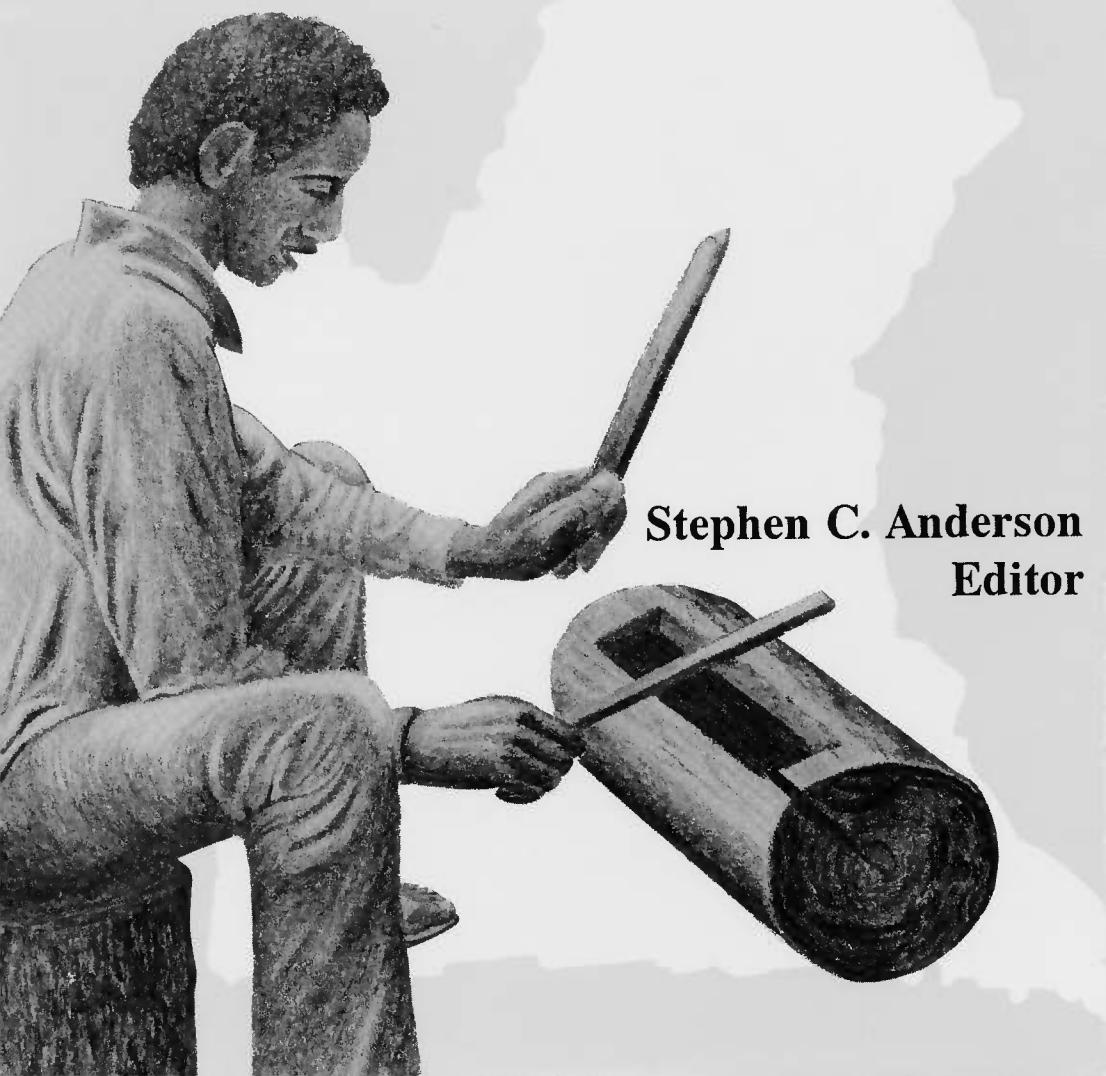


TONE IN FIVE LANGUAGES OF CAMEROON



**Stephen C. Anderson
Editor**

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**Tone in Five
Languages of Cameroon**

**Summer Institute of Linguistics and
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Tone in Five Languages of Cameroon

Stephen C. Anderson

Editor

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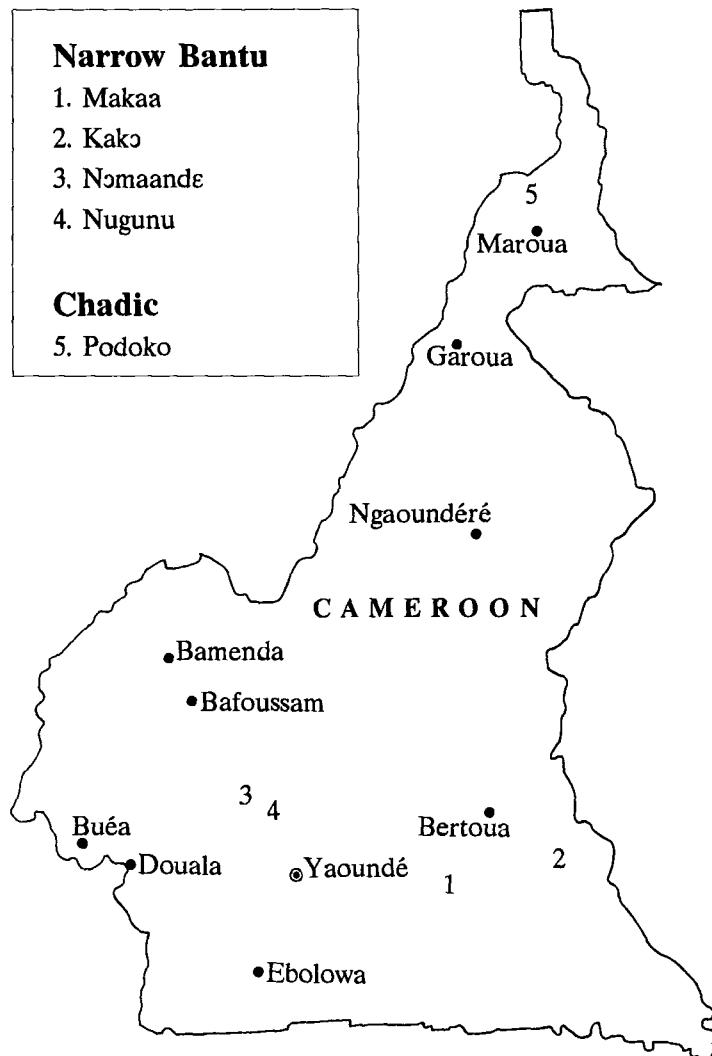
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Narrow Bantu

1. Makaa
2. Kaka
3. Nomaande
4. Nugunu

Chadic

5. Podoko



Preface

Stephen C. Anderson

This volume is, in many respects, an extension of Anderson and Comrie 1991, which included contributions from some of the same authors. While the earlier volume was organized and written to focus on tense and aspect categories, these semantic properties were often signaled by tone changes. The present volume, by its focus on tone changes found in other areas of the grammar of the same languages, complements the descriptions of the tonal phenomena seen in the earlier volume.

The tonal complexity of Grassfields Bantu languages is well attested in the literature. Less-well attested, however, is the fact that many of the same kinds of tonal phenomena (downstep, downdrift, floating tones, tonal morphemes, toneless morphemes) are also quite frequent in Narrow Bantu languages, especially those of southern Cameroon. Since this volume contains descriptions of four of these languages, the extent to which Bantu languages of Zone A mirror the complexities of Grassfields Bantu languages can now be studied more closely.

As in the case of many other descriptions of Cameroonian tone phenomena, various tone theories are here used in an attempt to capture complexities in the most pleasing manner possible. They are not confined to older autosegmental models à la Goldsmith, but some use more recent variations of these models such as Lexical Phonology (à la Pulleyblank) and Register Tier Phonology (à la Snider). What is significant, perhaps, is that no one uses tone theories outside of the autosegmental family of models to describe the kinds of changes found in Cameroon languages.

All of the contributions to this volume concern languages which have already had their tonal systems partially described in other articles. The

reality for researchers working on Cameroon languages is that the tone systems are so complex that one does not describe the whole system in one place. Particularly interesting in this regard is the article by Swackhamer on verbs that complements an earlier article on Podoko tone changes in the noun phrase (Anderson and Swackhamer 1981).

All of the articles in this collection deal with the tonal phenomena of a specific area of data. This data is often contained in the article itself, either in the actual text or in an appendix. Noteworthy in this regard are two long appendices, the first by Heath on the 320 associative noun phrases handled by his tone rules, and the second by Swackhamer on the classification of 627 Podoko verbs into their tone classes.

It was my pleasure to organize a workshop in early 1989 to focus on tone changes in Cameroon languages and to welcome Prof. Thilo Schadeberg and Keith Snider from the University of Leiden to help staff the course. The papers presented here were written after two weeks of lectures on tone phenomena and tone theories. During this time, we also benefited from the use of a prototype of a new computer device and software labelled CECIL, which simulated a phonetics laboratory. It not only helped us check our phonetic data at crucial points in the analysis, but also gave us spectrograms like those used in the paper by Swackhamer.

It is my hope that the present attempt to handle significant amounts of data with various tone theories will help us to better understand the advantages and disadvantages of specific theories and to formalize a theory which better handles a wide array of tone phenomena in a simple and insightful manner.

Préface

A bien des égards, ce volume peut être considéré comme la suite d'un précédent volume sur le temps et l'aspect (Anderson et Comrie 1991), incluant des articles présentés en grande partie par les mêmes auteurs. Alors que le volume précédent avait été écrit et organisé de façon à mettre l'accent sur les catégories de temps et d'aspect, ces caractéristiques sémantiques étaient souvent indiquées par la présence de divers changements tonals. Ce volume-ci, en mettant l'accent sur les changements tonals relevés dans d'autres domaines de la grammaire de ces mêmes langues, complète les descriptions des phénomènes tonals vus dans le premier volume.

La complexité des langues bantu des Grassfields est bien établie dans la littérature. Ce qui est moins bien établi est qu'une grande partie de ces phénomènes tonals (downstep, downdrift, tons flottants, tons à fonction de monèmes, monèmes sans ton propre) sont également assez fréquents dans

les langues bantu au sens étroit, et plus particulièrement dans celles du Sud du Cameroun. Comme ce volume contient des descriptions de quatre langues appartenant à ce groupe, le lecteur pourra étudier cette question de plus près et se faire une idée assez exacte de la mesure dans laquelle les langues bantu de la zone A reflètent la complexité des langues bantu des Grassfields.

Comme pour une grande partie des descriptions de phénomènes tonals dans les langues bantu du Cameroun, diverses théories tonales ont été appliquées pour tenter de rendre les complexités évidentes de la façon la plus satisfaisante. Les articles de ce volume ne se limitent pas aux modèles autosegmentaux du type de celui de Goldsmith, mais certains auteurs appliquent des variantes plus récentes de ces modèles, telles que la phonologie lexicale de Pulleyblank et la phonologie 'Register Tier' de Snider. Ce qui est significatif, sans doute, c'est qu'aucun d'eux n'aït eu recours à un modèle de description ne faissant pas partie de la famille autosegmentale pour décrire les types de changements relevés dans les langues du Cameroun.

Tous les articles de ce volume traitent des langues dont le système tonal a été déjà partiellement décrit par ailleurs. Le fait est que les systèmes tonals des langues du Cameroun sont trop complexes pour qu'un chercheur puisse envisager d'en faire une description complète en une seule fois. A cet égard, l'article de Swackhamer est particulièrement intéressant, en ce qu'il prolonge un précédent article sur les changements tonals dans le syntagme nominal en podoko (Anderson et Swackhamer 1981).

Tous les articles rassemblés ici tentent de décrire des phénomènes tonals en se basant sur un domaine particulier de données recueillies dans un domaine particulier. Ces données sont souvent présentées dans l'article, soit dans le texte lui-même, soit en appendice. Il faut remarquer à cet égard deux appendices d'une bonne longueur, celui de Heath contenant les 320 syntagmes associatifs traités par ses règles tonales et celui de Swackhamer, la classification de 627 verbes podoko d'après leur schème tonal.

Nous avons eu le plaisir d'organiser un atelier, au début de 1989, ayant pour sujet les changements tonals dans les langues du Cameroun. C'est avec une joie toute particulière que nous avons accueilli le professeur Thilo Schadeberg et M. Keith Snider, de l'Université de Leiden, au sein du personnel enseignant. Après deux semaines de cours sur les phénomènes et les théories tonals, une partie des participants est restée pour travailler sur les articles présentés dans cet ouvrage. Durant cette période, nous avons également eu l'occasion d'utiliser le prototype d'un nouveau logiciel et de hardware pour le micro-ordinateur. Ce programme, nommé CECIL, simule de différents instruments d'un laboratoire de phonétique. Il

ne nous a pas seulement été utile pour vérifier les données aux points cruciaux de notre analyse, mais il nous a aussi permis de tracer des spectrogrammes, comme ceux qui apparaissent dans l'article de Swackhamer.

Notre espoir est que cette tentative de traiter une quantité importante de données et de les décrire à l'aide de diverses théories tonales nous aidera à comprendre les avantages et les inconvénients de ces théories et sera utile, en fin de compte, pour la formulation d'une théorie qui permettra de mieux rendre compte d'une grande variété de phénomènes tonals à la fois d'une façon simple et en profondeur.

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Section One

Narrow Bantu Languages

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Tone in the Makaa Associative Construction

Daniel Heath

Abstract

Tone changes found in the Makaa associative (genitive) construction seem quite opaque because the rules needed to explain them are often very restrictive in their structural description. This paper uses an autosegmental approach to describe these tone changes and expects these same rules to be helpful in explaining the entire Makaa tone system.

The associative marker in Makaa can be a segment with high tone, a segmentless high tone, or a zero, depending on the class of the first noun in the associative construction. Ten rules are posited in order to explain tone perturbations that occur when two nouns are put together in such a construction.

Four of these rules govern tone spreading; three others govern changes caused by the cv(c) pattern of the final syllable of the first noun. Three additional rules are posited to describe when downdrift, downstep, and downtilt take place. The downstep rule in Makaa is unusually restrictive, as it never occurs within a word and is triggered by a floating low tone preceding a word boundary.

Many of the rules are extremely restrictive in their structural description. The tone of the nouns, the syllable structure of the first noun or the associative marker, the type of prefix on the second noun, and even the type of the final consonant of the first noun are crucial to whether or not a given rule applies. Because some of these factors (the structure of the associative marker and the type of prefix) are determined by noun class membership, the ongoing breakdown of the noun class system appears to be a possible historical cause for the present complexity of tone rules.

Résumé

Les changements de ton que l'on trouve dans le syntagme génitif mekaa semblent assez obscurs, parce que les règles pour les expliquer sont souvent très restrictives dans leur description structurale. Cet article est basé sur la théorie 'Autosegmental' pour décrire ces changements de ton. Nous espérons que ces mêmes règles seront un point de départ prometteur pour une description globale de toutes les autres structures tono-morphologiques en mekaa.

Le morphème du génitif a trois manifestations distinctes: un segment à ton haut, un ton haut sans segment, ou un zéro-morphème (ni segment, ni ton). Ces manifestations dépendent de la classe nominale du premier nom (*n₁*) dans le syntagme. Nous avançons dix règles pour expliquer les changements de tons qui interviennent lorsque deux noms sont mis en relation dans une telle construction.

Quatre parmi elles concernent la propagation de tons (e.g. certains tons influent sur des tons voisins); trois autres concernent les changements déclenchés par la présence d'une dernière syllabe ouverte ou fermée dans le *n₁*; enfin sont avancées trois règles d'abaissement tonal (downstep, downdrift,owntilt) qui expliquent les changements secondaires qui peuvent s'ensuivre. La règle de downstep est anormalement restrictive, ne s'appliquant que lorsque l'influence du ton bas flottant s'étend du premier nom au deuxième. Ce ton n'exerce pas d'influence à l'intérieur d'un mot.

Parmi ces dix règles, beaucoup sont extrêmement restrictives dans leur description structurale. En effet, plusieurs paramètres déterminent l'application de telle ou telle règle: la mélodie tonale des noms, la structure syllabique du *n₁* ou du morphème génitif, le type de préfixe du *n₂*, et même le type de consonne finale du *n₁*. Étant donné que certains de ces paramètres (la structure du morphème génitif et le type de préfixe nominal) sont déterminés par l'appartenance à telle ou telle classe nominale, l'atrophie du système des classes nominales apparaît comme une cause historique possible pour la complexité actuelle des règles en question.

This paper presents tone rules which govern tone perturbation on disyllabic nouns of the associative noun phrase of Makaa, a narrow Bantu language spoken in the southeastern part of the Republic of Cameroon.^t

Makaa has two associative constructions—one used to indicate possession and one that is nonpossessive. The possessive construction is not treated in this paper. Discussion is limited to the nonpossessive construction which is by far the more frequent and is primarily marked by tone

^tThis paper was produced at a linguistic workshop in Yaoundé, Cameroon, directed by Stephen C. Anderson. The author wishes to thank Dr. Anderson for his valuable counsel during analysis and for his continuous input throughout the writing of the paper. Special thanks also go to Mr. Kouamb Alexis for his patient help in supplying and checking the data used in this paper. Makaa has been classified by Guthrie (1971:33) as a Bantu language in the A.83 group. It has 22 consonant phonemes (b, c, d, f, g, h, j, k, l, m, n, p, ɲ, p, s, ʂ, t, v, w, y, z and ʐ) and 11 vowel phonemes (a, e, ɛ, ɔ, ə, i, ɪ, o, ʊ, u and ɯ). The reader interested in a further description of the consonants and vowels is referred to Heath and Heath (1981) and to Hegetschweiler (1989).

changes. The tone rules and conventions used here follow an autosegmental framework similar to the one first mentioned in Goldsmith 1976.

Although unusual for this language family, there are many consonant-sensitive tone rules in Makaa. The rules posited to explain tone changes are very specific, having quite restrictive environments. Some of the complexity of the rules is no doubt due to the ongoing decay of the noun class system. There are ten noun classes attested, and some of the concord distinctions have been neutralized. Additional concord distinctions are being neutralized by the younger generation. Consonant concord in the possessive pronoun prefix remains distinct for each of the ten classes, but other concord markers, such as in the associative marker, show neutralization of some of these contrasts.

Makaa has two phonemic tone levels, high (H) and low (L), which are indicated in this paper by accent marks (‘ and ` respectively). Long vowels, though written orthographically by a sequence of two vowel symbols, are treated the same as short vowels, since tone appears to function at the syllable level.

1. Noun classes and tone patterns

Before moving into a discussion of the specific rules which govern tone within the associative construction, an understanding of the underlying tone patterns of Makaa nouns is needed. A brief introduction to the Makaa noun class system as it relates to the associative marker follows.

1.1. Tone patterns of disyllabic noun roots. Given the presence of two level tones, high (H) and low (L), and two contour tones, high-low (HL) and low-high (LH) on monosyllabic noun roots, it might be expected that 16 tone patterns on disyllabic noun roots would occur. As is common in Cameroonian Bantu languages, however, the distribution of tones over disyllabic roots is much more restricted. A contour tone is never found on a first syllable, and only the HL contour is found on a final syllable. When disyllabic nouns are spoken in isolation, only the following six tone patterns are found: L-L, L-H, L-HL, H-L, H-H and H-HL. When nouns with falling tone pattern H-L are put into a frame with a following high tone, however, the falling tones are sometimes realized as H-L and sometimes as H-H, where the final low tone disappears before a high. Therefore, one additional contrastive tone pattern² needs to be added to the inventory, as seen in (1).

²This contrast is not found in the L-HL and H-HL patterns, as might be expected.

(1) Surface tone patterns on disyllabic noun roots

Surface Isolation	Surface Followed by H
L-L	L-L
L-H	L-H
L-HL	L-HL
H-L	H-L
H-L	H-H
H-H	H-H
H-HL	H-HL

In order to account for the difference in isolation tones between the two patterns which are realized as H-H before a following H, one is posited as having two underlying Hs (one on each syllable), while the other as having a single underlying H. A late downtilt rule (§2.3) will explain the presence of L before a pause. The following underlying tone patterns are therefore proposed:

(2) Underlying tone patterns on disyllabic noun roots

Underlying	Surface Isolation	Surface Followed by H
L	L-L	L-L
LH	L-H	L-H
LHL	L-HL	L-HL
HL	H-L	H-L
H	H-L	H-H
HH	H-H	H-H
HHL	H-HL	H-HL

1.2. Agreement and the associative construction. The Makaa language has ten noun classes (related to typical Bantu classes 1–10).³ Illustration (3) is a restricted chart of the noun class system, showing the noun prefix, the associative marker (AM), and the form of the stative verb for each class (with the associative marker being treated as a pre-prefix on N2).

³For a fuller description of the noun class system in Makaa, the reader is referred to Heath and Heath (1982). Makaa noun classes usually follow normal Bantu concord in that it has L concord for class 1 (including 1a and 1b) and H concord for classes 2, 3, 4, 5, 6, 7, 8 and 10. It differs, however, in that class 9, which usually has L concord in Bantu systems, usually has H concord in Makaa though it does parallel class 1 in the associative marker where it has Ø concord in contrast to H concord.

(3) Makaa noun prefixes, associative markers, and stative verb forms

Class	Prefix	AM	Stative verb (-sə̄)
1	N-		
	L-	Ø-	jī-
1a	mù-		
2	ò-	ó-	bú-
2a	bù-		
3	Ø-	H-	wú-
4	mì-	mí-	mí-
5	L-	H-	dú-
	ˋd-/j-		
6	mò-	mò-	mú-
	m-		
7	Ø-	H-	jí-
8	i-	i-	bí-
9	L-	Ø-	nyí-
10	N-	Ø-	nyí-

Note that classes 1, 9, and 10 have a zero concord marker (\emptyset) in the associative noun phrase. Classes 2 through 8 have high tone concord. The singular classes 3, 5, and 7 have only a floating high tone concord marker. The plural classes 2, 4, 6, and 8 also have high tone, but in addition have segments which are the same as the corresponding noun prefixes. Classes 2 and 8 have a v syllable as their segmental marker while classes 4 and 6 have a cv syllable.⁴ The importance of the shape of these markers is discussed below.

Classes 9 and 10 are limited in size. Most of the distinctions in agreement between these two classes have been neutralized, leaving only two differences. First, class 9 has a floating L prefix, while class 10 has a L homorganic nasal. Second, class 9 is a singular class that usually takes class 6 as its plural, whereas class 10 nouns are mass nouns that form a single class gender having no singular form.

It might be suggested that class 10 nouns should be class 6a, since they are mass nouns and have a L homorganic nasal prefix. However, since all other concord is identical to class 9 (and not class 6), we have chosen to

⁴The class 5 associative marker has an alternate form lú, which functions tonally like the plural associative markers. It is used, however, with only a limited set of nouns. This marker seems to be in the process of disappearing, being the last of the singular H concord markers to be simplified to a floating H. The exact set of nouns using this alternate form seems to be conditioned by dialect and/or idiolect.

call these class 10 nouns, supposing a historical merger between class 6a and 10.

Classes 1 and 9 are also unusual when compared to other Bantu languages where these classes usually have a L associative marker in contrast to the other classes. Makaa maintains the tonal contrast in the associative construction between 1 and 9 and the other classes (with the exception of class 10) though the L has completely dropped out.

2. Tone rules

The first tone rules discussed are in regard to mapping. Then follows a discussion of the rules that govern tone changes when nouns are put into the associative construction.

As is seen from the following discussion, most Makaa tone rules have very restricted environments. These include: (a) whether the final tone of the first noun is H or L; (b) whether the final syllable of the first noun is open or closed; (c) whether the associative marker is segmental or not; (d) whether a segmental associative marker is cv or v; (e) whether the noun prefix of the second noun is segmental or not; (f) whether a nonsegmental second-noun prefix is zero or a floating L; and (g) whether the first root tone of the second noun is H or L.

Most of the examples in the body of this paper are taken from charts in the appendix, with the reference in parentheses following the gloss.⁵ References are made first to the chart, and then to the number of the example. Thus, example 21 in Chart A is referred to as A21.

In the following discussion, the associative marker is considered as a pre-prefix on the second noun. Thus, in the formal representation of the rules, the first position after the word break is the associative marker,

⁵Eight charts in the appendix provide the phonetic tone data on which the present study is based. These charts show the restrictions in a logical manner. The left-most column is divided into four sections of ten examples each. The first three sections show the H concord associative constructions, with one section for each concord variant. The last section shows those constructions with no concord (\emptyset). As was noted in chart (3) above, plural nouns in the first noun position have a segmental associative marker (either cv- or v-) while singular nouns (with either \emptyset - or L-) have either a tonally marked concord or no concord. For purposes of simplifying the charts, only those singular nouns with either a floating L or a \emptyset prefix are used. The variant sub-class forms, though listed in the charts, have a very limited inventory, and do not affect the analysis. Class 10 is in the process of disappearing with only a couple of nouns remaining in it. The eight charts differ one from another according to the structure of the second noun found in the right-hand column.

followed by the noun class prefix of the second noun, followed in turn by the first syllable of the root of the second noun.

2.1. Mapping rules. The first tone rule which applies to underlying lexical forms is a general mapping rule. Tones need to be mapped onto segments within morphemes before any other tone rules are applied. Tones are mapped onto segments beginning with the first syllable on the left in each morpheme, mapping one tone to one syllable, and moving to the right until all the tones are connected to at least one syllable. When there is an extra (unmapped) tone left over at the end of a morpheme, it is also mapped onto the last syllable. When there is a segmentless morpheme (e.g., an associative marker of class 3, 5, or 7, or noun prefix of class 1, 5, or 9), the tone is left floating by this general mapping rule.

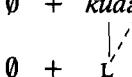
After mapping has taken place, if there is still a syllable in a morpheme without an associated tone (such as in disyllabic noun roots with only one underlying tone, whether H or L), the following rule must be applied.

(4) Mapping rule for single tone disyllabic noun roots



When a noun root has only one underlying tone (whether H or L), the tone associated to the first syllable of the root, by the general mapping rule, spreads to the right and associates also with the second syllable. An example of this is the word *kùdà* ‘fire’, a noun of Class 7 with a zero prefix, which would be mapped as in (5). When mapping rules are applied, L on the root is mapped onto the first syllable and spread onto the second, resulting in the surface form *kùdà*.

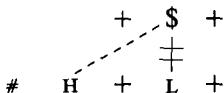
(5) $\emptyset + kuda$



2.2. Tone rules. Discussion of the main tone rules begins with a presentation of tone spreading rules, where tones spread rightward or leftward, either from or onto the associative marker. This is followed by a presentation of three rules describing tone changes in the final syllable of the first noun. These three rules create environments that contribute to the late phonetic realization rules, described in §2.3.

Rightward spreading H onto the second-noun prefix. In associative noun phrases with H concord whether floating or associated, and where the second noun has a segmental prefix as in plural noun class 2, 4, 6 or 8, then the H of the associative marker spreads right onto the syllabic prefix of the second noun, dissociating the L of that prefix. This rule applies regardless of what the tone of the second noun root is and is formalized in (6).⁶

- (6) Rightward spreading high tone onto the second noun prefix rule



In (7), the associated H of the associative marker *i* spreads right onto the L second-noun prefix *mà*, disassociating the lexical L.

- (7) *i-kaafe i-mà-kwiindye → ikààfè imákwiündyè*

 c8-macabo AM-C6-post
 macabos of the posts (B51)

In (8), the underlying L of the noun prefix *mà-* of *màkwündyè* ‘posts’ is dissociated when the floating H of the associative marker moves right onto this segment. This example shows that the H of the associative marker spreads only one morpheme to the right.

- (8) *Ø-bude Ø-mà-kwiindye → bùdè mókwündyè*

 c5-potato AM-C6-post
 potato of the posts (B61)

Example (9) differs from (8) in that the underlying tone of the second noun root is H rather than L.

- (9) *Ø-bude Ø-mà-bagə → bùdè mábágá*

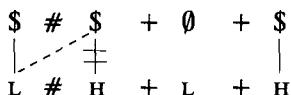
 c5-potato AM-C6-ash
 potato of the ashes (A21)

⁶The H associative marker can be either floating or associated.

In (9), one might expect to see downstep occurring because of the L in the second-noun prefix which is caused to float as a result of the rightward spreading associative marker. Makaa is unusual, however, in that it does not allow downstep within a word. This restriction is discussed further in §2.3.

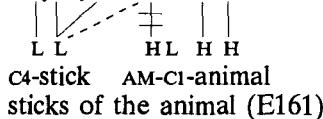
Rightward spreading L onto associative markers. This next rule is perhaps the most restrictive one in this series. All of the following conditions must be met in order for it to operate. When the associative marker has a segment (i.e., H concord caused by agreement with a plural first noun), and the final tone on the first noun is an associated L, and the second noun has a floating L prefix and a H noun root, then the following rule is necessary. The final L on the first noun associates rightward onto the associative marker, dissociating its H tone. The formalization of this rule can be seen in (10).

- (10) Rightward spreading L onto associative marker rule

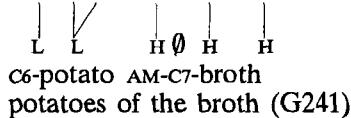


In (11) below, where *cúdú* ‘animal’ has a class 1 floating L prefix, this rule can be seen to operate. In (12), however, where *cáánzá* ‘broth’ has a zero prefix, this rule does not operate.

- (11) *mi-fidyé mi-∅-cudu* → *mifidyè mì cúdú*



- (12) *mə-bude mə-∅-caanza* → *məbùdè mā cáánzá*



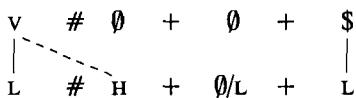
It is because of the tonal contrast between (11) and (12) that it is necessary to posit a floating L prefix for all nouns of classes 1, 5, 9, and 10, whereas classes 3 and 7 must be viewed as having a zero prefix. In other words, the low tone only spreads rightward when the second noun is of class 1, 5, 9, or 10, and not when it is of class 3 or 7. This can best be accounted for by positing a L prefix for the former and a zero prefix for the latter. Additional examples of this can be seen in the appendix

where example A162 contrasts with G242. It should be noted that the L prefix for classes 1, 5, 9, and 10 has no other function than to trigger the preceding rule at the right time. The same prefix trigger mechanism may also be necessary between verbs and following objects in certain verbal constructions which are outside the scope of this paper.

Leftward spreading H onto the first noun. In the rightward spreading rules above, the syllabic structure of the morphemes within the construction was irrelevant. We now discuss two leftward spreading rules, in which the syllable structure of the first noun is a factor. The two leftward spreading rules are similar, but need to be formalized separately because they differ in the shape of the final syllable of the first noun.

In the restricted environment where (a) the associative marker is a segmentless H; (b) the second noun has either a floating L or a zero prefix and a L noun root; and (c) the final syllable of the first noun is open and associated to a L; then the H of the associative marker spreads left onto the final vowel of the first noun, creating a rising tone glide. The rule is formalized in (13). Examples (14) and (15) illustrate this leftward spreading rule, where the underlying final tone of the first noun is L and a glide to H is created.

(13) Leftward spreading H onto the first noun rule



(14) $\emptyset\text{-}bude \quad \emptyset\text{-}\emptyset\text{-}juga \rightarrow bùdě jùgà$

L L H \emptyset L
cs-potato AM-c7-plug
potato of the plug (H301)

(15) $\emptyset\text{-}buga \quad \emptyset\text{-}\emptyset\text{-}ŋkasa \rightarrow búgǎ ŋkàsà$

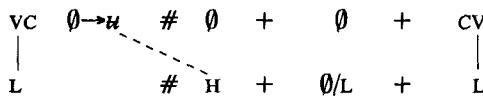
L H L H L L
cs-corner AM-c1-(bird)
corner of the (bird) (F222)

Makaa is unusual among Cameroonian Bantu languages in that HLH does not simplify to HHH even though downstep does occur in the language.⁷

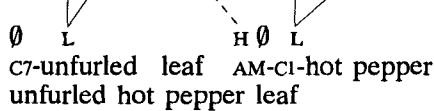
⁷The restrictions to downstep are discussed in §2.3.

Leftward spreading H vowel epenthesis. In (13), the first noun ended in an open syllable. For cases in which this syllable is closed, the leftward spreading H vowel epenthesis rule must be posited. This rule operates when (a) the associative marker is a segmentless H; (b) the second noun has either a floating L or a zero prefix and a L noun root; and (c) when the final syllable of the first noun is closed and associated to a L. When these conditions occur, an epenthetic vowel (u) is created at the end of the first noun and the H of the associative marker spreads left onto this vowel. The rule is formalized in (16) and illustrated in (17) and (18), where the epenthetic vowel u is created after cwòlòòmb. This vowel always takes the H of the associative marker which spreads leftward. The same rule applies whether the L noun has a zero prefix as in (17) or a floating L prefix as in (18).

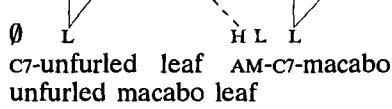
(16) Leftward spreading H vowel epenthesis rule



(17) 0-cwoloomb 0→u 0-0-baage → cwòlòòmb u bààgè



(18) 0-cwoloomb 0→u 0-0-kaafe → cwòlòòmb u kààfè



Falling simplification. As mentioned in §1.1, there are two underlying tone patterns, L-HL and H-HL, which result in falling tones on the final syllable of disyllabic nouns. When these patterns occur on a noun with a final open syllable, the falling tone is simplified to H with the L of the glide being dissociated.

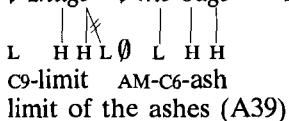
It should be noted that this falling simplification rule applies only when the falling tone is word final but not utterance final. In the formalization of the rule below we have used the symbol # rather than // to indicate this distinction. Also, the syllable structure of the first noun is crucial, as the rule applies only when the final syllable is open.

- (19) Falling simplification rule



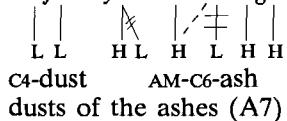
When the L is dissociated and is followed by a L morpheme (i.e., in certain no concord situations), the dissociated L has no effect when it precedes an associated L, as seen in (20). It is the associated L which causes the downdrift, as described below in (31).

- (20) Ø-zhugə Ø-mə-bagə → zhúgá màbágá



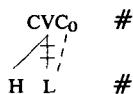
However, this rule also feeds the downstep rule when the following word begins with H. In (21), *mifùmbyá* is followed by the H associative marker *mí*. The floating L therefore causes the following H to be lowered in pitch because it feeds the downstep rule described in (33) below. (Downstep is indicated by '!' before the syllable whose H is realized on a lower register.)

- (21) mi-fumbya mi-mə-bagə → mifùmbyá !mí màbágá



Falling spread to coda consonant. In the falling simplification rule, a falling tone on an open final syllable in the first noun was simplified to H, with the final L being dissociated. When the final syllable is a closed syllable, however, the final L not only dissociates from the vowel, but reassociates (or spreads) to the final consonant, rather than remaining a floating L. This final consonant is always a continuant (l, m, n, w or y), symbolized by C₀. No stops have been attested as final consonants in nouns having a falling tone as the final tone, whether disyllabic or monosyllabic. In (23) the falling tone spreads on to the final consonant l of *ncwòmbôl*.

- (22) Falling spread to coda consonant rule



- (23) *Ø-ncwombol Ø-ma-baga* → *ncwòmból mèbágá*

$\begin{array}{c} \\ L \end{array}$	$\begin{array}{c} \\ L \end{array}$	$\begin{array}{c} \diagup \\ H \end{array}$	$\begin{array}{c} \\ L \end{array}$	$\begin{array}{c} \\ \emptyset \end{array}$	$\begin{array}{c} \\ L \end{array}$	$\begin{array}{c} \\ H \end{array}$	$\begin{array}{c} \\ H \end{array}$
c1-hot	pepper	AM-C6-ash					

hot pepper of the ashes (A38)

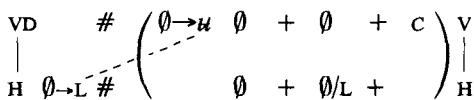
Depressor consonant causing register lowering. In some of the rules discussed to this point, the syllable structure of the first noun was important. This next rule applies only when the final syllable of the first noun is closed, and where the final consonant causes tone lowering (either downstep or downdrift). Because this rule has very restricted environments, only a small inventory of nouns has been attested, and with only *d* and *g* as final consonants in disyllabic nouns in these environments. The term depressor consonant (symbolized by Ø) is used for these consonants.⁸

This register lowering rule operates in two different environments. The first environment is in a H concord situation. When the final syllable of the first noun has H and closes with a depressor consonant and when the associative marker is a H segment consisting of only a vowel, then the depressor consonant of the first noun causes the creation of a floating L. This floating L functions to trigger the downstep rule.

The second environment differs from the first in that it consists of a no concord situation (i.e., the first noun must be a noun of either Class 1, 9, or 10). The second noun must also be a singular noun (i.e., with either a floating L or a zero prefix). When this occurs, the depressor consonant not only creates a L, but also creates an epenthetic vowel to carry it.

One possible formalization of this rule is seen in (24). Notice that the epenthetic vowel has been placed to the right of the word break. This is for ease of formalizing the rule. The epenthetic vowel might be better placed to the left of the word break as we did in the leftward spreading H vowel epenthesis rule above, but this would not allow for the two word break signs to be one above the other and still have a normal parenthesis.

- (24) Depressor consonant tone lowering rule



⁸The study of monosyllabic nouns is outside of the scope of this paper. Preliminary observations of monosyllabic nouns show irregularity as to the application of this rule. Further study may result in a slight revision of this rule to handle them.

Examples (25) and (26) illustrate the first environment described above where the structure of the final syllable of the first noun is the determining factor. In (25), the final consonant *g* of *káámbúg* creates a floating *L*, which in turn causes the downstep of the *H* associative marker. Example (26), however, shows that when the final syllable of the first noun is open, downstep does not occur.

- (25) *o-kaambug* *o-mə-bagə* → *òkáámbúg !ó mábágá*

<i>L</i>	<i>H</i>	<i>H</i>	$\emptyset \rightarrow L$	<i>H</i>	<i>L</i>	<i>H</i>	<i>H</i>
<i>C2-(ant)</i>				<i>AM-C6-ash</i>			

(ants) of the ashes (A15)

- (26) *o-cudu* *o-mə-bagə* → *òcúdú ó mábágá*

<i>L</i>	<i>H</i>	<i>H</i>	<i>H</i>	<i>L</i>	<i>H</i>	<i>H</i>
<i>C2-animal</i>			<i>AM-C6-ash</i>			

animals of the ashes (A14)

Examples (27)–(30) illustrate the second environment where depressor consonants influence tone. In the first two examples, the final consonant *g* of *káámbúg* creates a *L* and an epenthetic vowel *u* to bear that tone. This causes the following *H* to be downdrifted. In the second two, where the final syllable of *mpónđú* ‘mouse’ is open, the rule does not operate.

- (27) $\emptyset\text{-}kaambug$ $\emptyset \rightarrow u$ $\emptyset\text{-}\emptyset\text{-}cudu \cdot$ → *káámbúg ù cídú*

<i>L</i>	<i>H</i>	<i>H</i>	$\emptyset \rightarrow L$	\emptyset	<i>L</i>	<i>H</i>	<i>H</i>
<i>C1-(ant)</i>					<i>AM-C1-animal</i>		

(ant) of the animal (E195)

- (28) $\emptyset\text{-}kaambug$ $\emptyset \rightarrow u$ $\emptyset\text{-}\emptyset\text{-}caanzə$ → *káámbúg ù cáánzə*

<i>L</i>	<i>H</i>	<i>H</i>	$\emptyset \rightarrow L$	\emptyset	\emptyset	<i>H</i>	<i>H</i>
<i>C1-(ant)</i>					<i>AM-C7-broth</i>		

(ant) of the broth (C275)

- (29) $\emptyset\text{-}mpónđu$ $\emptyset\text{-}\emptyset\text{-}cudu$ → *mpónđú cídú*

<i>L</i>	<i>H</i>	<i>H</i>	\emptyset	<i>L</i>	<i>H</i>	<i>H</i>
<i>C1-(mouse)</i>				<i>AM-C1-animal</i>		

(mouse) of the animal (E194)

- (30) $\emptyset\text{-}m\acute{e}\text{\o}ndu \emptyset\text{-}\emptyset\text{-}caanza \rightarrow mp\acute{a}nd\acute{u} c\acute{a}anz\acute{a}$

L	H	H	\emptyset	\emptyset	H	H
c1-(mouse)	AM-C7	broth				
(mouse)	of the	broth	(E274)			

2.3. Late phonetic realization rules. Three additional rules must be posited to explain the lowering of pitch in certain environments—downdrift, downstep, and downtilt.

Downdrift. In order to predict the phenomenon of downdrift, where an associated L automatically causes the following H to be lowered, there must be a late downdrift rule which might be formalized as in (31).⁹

- (31) Downdrift rule

$$\begin{array}{cc} \$ & \$ \\ | & | \\ L & H \end{array} \rightarrow +1 \text{ pitch}$$

In this rule, a nonlowered H is given a pitch value of 1, and a nonlowered L is given a value of 3. A L, when followed by a H, will cause the H and any other tones following it to be given a value of one pitch lower. This means that all tones, both H and L, are lowered the same amount, and the difference in pitch between further H and L tones does not decrease. The new values for H and L will continue to the end of the phrase (where the tonal register is then reset to its original height), or until another lowering occurs. This was mentioned above in (19) but is further illustrated by example (32).

- (32) $\emptyset\text{-cundy}\acute{e} \emptyset\text{-m}\acute{a}\text{-bag}\acute{a} \rightarrow c\acute{u}ndy\acute{e} m\grave{a}bág\acute{a}$

L	H	L	\emptyset	L	H	H	1	3	3	2	2
c1-chief	AM-C6	ash									
chief	of the	ashes	(A32)								

The Hs of *bágá* are lowered in pitch because of the associated L on the prefix. The pitch values are given with numbers to represent the phonetic realization. If there were a L following in the same phrase, it would have a value of 4. Downdrift is not marked in the examples in this paper

⁹The formalization of this rule as well as that of the downstep rule reflects that of Anderson's (1983:145) downstep rule.

because it is completely predictable, occurring whenever a **H** follows an associated **L**.

Downstep. The downstep rule is similar to the downdrift rule, except that downstep is caused by the presence of a floating **L** rather than an associated **L**, and, crucially, downstep occurs only when the floating **L** immediately precedes a word boundary. An associated **H** is therefore downstepped when it is immediately preceded by another word containing a final floating **L**, which is preceded by an associated **H**. Any following **H** has the same pitch as the downstepped **H**, and any following **L** has a pitch value of two lower than the pitch value of the preceding **H**. Thus the difference in pitch value between further **H** and **L** tones remains the same. These lowered values continue until there is another lowering due to downdrift or downstep, or until the register is reset to the original values at the beginning of a new phrase.

The downstep rule is formalized in (33).

(33) Downstep rule

$$\begin{array}{ccc} \$ & \# & \$ \\ | & | & | \\ H L & \# & H \end{array} \rightarrow +1 \text{ pitch}$$

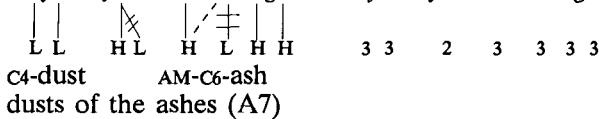
Downstep was mentioned in §2.2 involving depressor consonants. Example (25) from that section is repeated here as (34), with numbers for the actual phonetic tone height.

(34)	<i>o-kaambug</i>	<i>o-mə-bagə</i>	$\rightarrow \dot{o}káámbúg !ó mábágá$
	$\begin{array}{ccccc} & & & & \\ L & H & H & \emptyset & \xrightarrow{L} H \\ c2-(ant) & & & AM-c6-ash & \\ & & & & (ants) \text{ of the ashes (A15)} \end{array}$	$\begin{array}{ccccc} & & & & \\ & & & L & H H \\ & & & & 3 \ 2 \ 2 \ 3 \ 3 \ 3 \ 3 \end{array}$	

In (34), the depressor consonant *g* of *káámbúg* creates a floating **L**, which causes all subsequent **H**s to be downstepped. This includes the **H**s that are spread by the rightward spreading **H** onto the second noun prefix rule (§2.2). Since the first **H** in (34) is downdrifted one level, the two register lowerings result in a phonetic **H** realized on the same level as a phrase initial **L**.

In example (19), the falling simplification rule described the creation of a floating **L** at the end of a word, which creates the environment for a following **H** to be downstepped. Example (21) from that section is also repeated here in (35) with the addition of numbers for the actual tone heights.

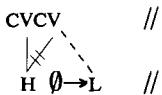
- (35)
- mi-fumbya mi-mə-bagə*
-
- mifümbyá !mí mábágá*



Makaa is unusual in that this downstep process only occurs when there is a word boundary between the floating L and the H to be downstepped. Downstep never occurs within the word. In example (35) above, the dissociated L from *fumbya* in the first noun causes the associative marker *mi* to be downstepped. However, though the L of *mə* (second-noun prefix) is also dissociated (by the rightward spreading H onto the second-noun prefix rule), the following H tones of *bagə* are not downstepped further. If they were also downstepped, they would have a pitch value of 4, instead of a pitch value of 3.

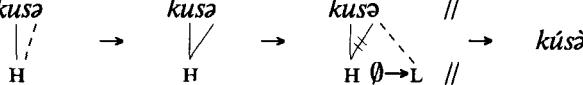
Downtilt. As mentioned in §1.1, there are nouns for which only one underlying H is posited. In isolation, these nouns are pronounced H-L. When they are followed by other morphemes, the L is not present, indicating that the final L of these words occurs only utterance final. It is, therefore, necessary to posit a late downtilt rule for nouns with a single underlying H in an utterance final position, as in (36).

- (36) Downtilt rule



In order to be able to explain how a word like *kúsə* ‘widow’, a noun with only one underlying H, receives a H-L pronunciation in isolation, a phrase final rule is applied to add a L to the end of the utterance, dissociating the H from the final syllable. The sequence of changes that the noun undergoes is shown in (37). First the mapping rule spreads the H to the second syllable. Then the late downtilt rule creates a L and associates it to the final syllable while dissociating the H.

- (37)
- kúsə*
-
- kúsə*
-
- kúsə*
- // →
- kúsə*



3. Conclusion

From the discussion above, it is apparent that the rules governing tone in the Makaa associative construction are often extremely restrictive in environment. The tone of the nouns, the syllable structure of the first noun or the associative marker, the type of prefix of the first noun, and even the type of the final consonant of the first noun are crucial as to whether or not a rule applies. Because some of these factors (the structure of the associative marker and the type of prefix) are determined by noun class membership, we see the ongoing breakdown of the noun class system as a probable cause of the present complexity of the tone rules. The downstep rule in Makaa is also unusually restrictive, never occurring within a word and triggered only by a floating L preceding a word boundary.

The more restricted the environment of a rule, the smaller the corpus of attested examples. Because of the complexity (i.e., specificity) of many of the tone rules posited, even an autosegmental analysis does not give the researcher the feeling that he has gone much beyond descriptive adequacy in trying to provide an analysis. It is hoped that the large corpus of associative examples in the appendix will enable concerned theoreticians to build a tone theory which will handle Makaa perturbations in a more explanatory manner.

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Appendix

Chart A: N2 = CV-H H

N1 + N2 = CV-H H

(Classes 4, 6 - H concord with CV marker)

CV-L	1. <i>màbùdè má mábágá</i>	'potatoes of the ashes'
CV-H L	2. <i>màbúgà má mábágá</i>	'corners of the ashes'
CV-L H	3. <i>màbwòdògú má mábágá</i>	'melons of the ashes'
CV-H H	4. <i>míciidá mí mábágá</i>	'(belts) of the ashes'
	5. <i>míyákúkád mí mábágá</i>	'brave men of the ashes'
CV-H	6. <i>mikúsá mí mábágá</i>	'widows of the ashes'
CV-L HL	7. <i>mífùmbyá !mí mábágá</i>	'dusts of the ashes'
	8. (not attested)	
CV-H HL	9. <i>micúulí !mí mábágá</i>	'(ants) of the ashes'
	10. <i>milúndáí mí mábágá</i>	'searchings of the ashes'

(Classes 2, 8 - H concord with V marker)

V -L L	11. <i>ikàáfè í mábágá</i>	'macabos of the ashes'
V -H L	12. <i>ófúgà ó mábágá</i>	'(ants) of the ashes'
V -L H	13. <i>ibùmá í mábágá</i>	'seeds of the ashes'
V -H H	14. <i>ócéudá ó mábágá</i>	'animals of the ashes'
	15. <i>ókáámbúg ló mábágá</i>	'(ants) of the ashes'
V -H	16. <i>ókáwó ó mábágá</i>	'chickens of the ashes'
V -L HL	17. <i>ijilá !lí mábágá</i>	'replacements of the ashes'
	18. <i>íjùdál í mábágá</i>	'corpses of the ashes'
V -H HL	19. <i>óncédé ló mábágá</i>	'(hot peppers) of the ashes'
	20. <i>íjúwáí í mábágá</i>	'thieves of the ashes'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L L	21. <i>bùdè mábágá</i>	'potato of the ashes'
Ø/L-H L	22. <i>búgà mábágá</i>	'corner of the ashes'
Ø/L-I H	23. <i>bwòdògú mábágá</i>	'melon of the ashes'
Ø/L-H H	24. <i>wáágá mábágá</i>	'(vegetable) of the ashes'
	25. <i>nykúñkád mábágá</i>	'brave man of the ashes'
Ø/L-H	26. <i>kúá mábágá</i>	'purchase of the ashes'
Ø/L-L HL	27. <i>fúmbyá !mábágá</i>	'dust of the ashes'
	28. <i>jùdál mábágá</i>	'corpse of the ashes'
Ø/L-H HL	29. <i>cúulí !mábágá</i>	'(ant) of the ashes'
	30. <i>júwáí mábágá</i>	'thief of the ashes'

(Classes 1, 9, 10 - No concord)

L-L L	31. <i>bàágé mábágá</i>	'(hot pepper) of the ashes'
L-H L	32. <i>cúnídè mábágá</i>	'chief of the ashes'
L-L H	33. <i>mpúmá mábágá</i>	'seed (mass) of the ashes'
L-H H	34. <i>cúdú mábágá</i>	'animal of the ashes'
	35. <i>káámbúg mábágá</i>	'(ant) of the ashes'
L-H	36. (not attested)	
L-L HL	37. <i>ncàmá mábágá</i>	'(tree) of the ashes'
	38. <i>ncwòmbòl mábágá</i>	'hot pepper of the ashes'
L-H HL	39. <i>zhúgá mábágá</i>	'limit of the ashes'
	40. <i>nykúmbáí mábágá</i>	'diarrhea of the ashes'

Chart B: N2 = CV-L

N1 + N2 = CV-L

(Classes 4, 6 - H concord with CV marker)

CV-L	41. <i>màbùdè</i> má mákwiündyé	'potatoes of the posts'
CV-H L	42. <i>màbúgà</i> má mákwiündyé	'corners of the posts'
CV-L H	43. <i>mâbwókogú</i> má mákwiündyé	'melons of the posts'
CV-H H	(CV) 44. <i>màwáágó</i> má mákwiündyé	'(ants) of the posts'
	(CVC) 45. <i>mìykúñkád</i> mí mákwiündyé	'brave men of the posts'
CV-H	46. <i>míkúsá</i> mí mákwiündyé	'widows of the posts'
CV-L HL	(CV) 47. <i>mífùmbyá</i> !mí mákwiündyé	'dusts of the posts'
	(CVC) 48. (not attested)	
CV-H HL	(CV) 49. <i>mícuúlú</i> !mí mákwiündyé	'(ants) of the posts'
	(CVC) 50. <i>milúndáí</i> mí mákwiündyé	'searchings of the posts'

(Classes 2, 8 - H concord with V marker)

V-L	51. <i>ikàáfè</i> í mákwiündyé	'macabos of the posts'
V-H L	52. <i>òsfágá</i> ó mákwiündyé	'(ants) of the posts'
V-L H	53. <i>ibùmá</i> í mákwiündyé	'seeds of the posts'
V-H H	(CV) 54. <i>òcídú</i> ó mákwiündyé	'animals of the posts'
	(CVC) 55. <i>òkáámbág</i> !ó mákwiündyé	'(ants) of the posts'
V-H	56. <i>òkúwó</i> ó mákwiündyé	'chickens of the posts'
V-L HL	(CV) 57. <i>ijítá</i> !í mákwiündyé	'replacements of the posts'
	(CVC) 58. <i>ifùdáí</i> í mákwiündyé	'corpses of the posts'
V-H HL	(CV) 59. <i>óncéédé</i> !ó mákwiündyé	'(hot peppers) of the posts'
	(CVC) 60. <i>ijúwál</i> í mákwiündyé	'thieves of the posts'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L	61. <i>bùdè</i> mákwiündyé	'potato of the posts'
Ø/L-H L	62. <i>búgá</i> mákwiündyé	'corner of the posts'
Ø/L-L H	63. <i>bwòdògú</i> mákwiündyé	'melon of the posts'
Ø/L-H H	(CV) 64. <i>wáágás</i> mákwiündyé	'(vegetable) of the posts'
	(CVC) 65. <i>ykúñkád</i> mákwiündyé	'brave man of the posts'
Ø/L-H	66. <i>kíúsá</i> mákwiündyé	'widow of the posts'
Ø/L-L HL	(CV) 67. <i>fúnmbýá</i> !mákwiündyé	'dust of the posts'
	(CVC) 68. <i>fàdáí</i> mákwiündyé	'cadaver of the posts'
Ø/L-H HL	(CV) 69. <i>cúulú</i> !mákwiündyé	'(ant) of the posts'
	(CVC) 70. <i>júwál</i> mákwiündyé	'thief of the posts'

(Classes 1, 9, 10 - No concord)

L-L	71. <i>bàágé</i> mákwiündyé	'hot pepper of the posts'
L-H L	72. <i>cúndyé</i> mákwiündyé	'chief of the posts'
L-L H	73. <i>mpúmá</i> mákwiündyé	'seed (mass) of the posts'
L-H H	(CV) 74. <i>cúdú</i> mákwiündyé	'animal of the posts'
	(CVC) 75. <i>káámbúg</i> mákwiündyé	'(ant) of the posts'
L-H	76. (not attested)	
L-L HL	(CV) 77. <i>ncàmá</i> mákwiündyé	'(tree) of the posts'
	(CVC) 78. <i>ncwòmbóí</i> mákwiündyé	'hot pepper of the posts'
L-H HL	(CV) 79. <i>zhúgá</i> mákwiündyé	'limit of the posts'
	(CVC) 80. <i>nykúmbáí</i> mákwiündyé	'diarrhea of the posts'

Chart C: N2 = V-H H

N1 + N2 = V-H H

(Classes 4, 6 - H concord with CV marker)

CV-L	81. <i>màbùdè má ócúdú</i>	'potatoes of the animals'
CV-H L	82. <i>màbùgà má ócúdú</i>	'corners of the animals'
CV-L H	83. <i>màbwòdgú má ócúdú</i>	'melons of the animals'
CV-H H (CV)	84. <i>màwáágà má ócúdú</i>	'(vegetables) of the animals'
CV-H H (CVC)	85. <i>miyákýkád mí ócúdú</i>	'brave men of the animals'
CV-H	86. <i>mikáisá mí ócúdú</i>	'widows of the animals'
CV-L HL	87. <i>mifùmbyá lmí ócúdú</i>	'dusts of the animals'
CV-H HL	88. (not attested)	
CV-L HL	89. <i>micúáhlí lmí ócúdú</i>	'(ants) of the animals'
CV-H HL	90. <i>milándál mí ócúdú</i>	'searchings of the animals'

(Classes 2, 8 - H concord with V marker)

V-L	91. <i>ikááfè í ócúdú</i>	'macabos of the animals'
V-H L	92. <i>ósiágó ó ikágó</i>	'(ants) of the children'
V-L H	93. <i>ibùmá t ócúdú</i>	'seeds of the animals'
V-H H (CV)	94. <i>ócúdú ó ikágó</i>	'animals of the children'
V-H H (CVC)	95. <i>ókáámbúg ló ikágó</i>	'(ants) of the children'
V-H	96. <i>ókúwó ó ikágó</i>	'chicken of the children'
V-L HL	97. <i>ijilá ll ócúdú</i>	'replacements of the animals'
V-CV HL	98. <i>ifùdáì t ócúdú</i>	'the corpses of the animals'
V-H HL	99. <i>óncédé ló ikágó</i>	'(hot peppers) of the children'
V-CV HL	100. <i>ijáwáì t ócúdú</i>	'thieves of the animals'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L	101. <i>bùdè ócúdú</i>	'potato of the animals'
Ø/L-H L	102. <i>búgà ócúdú</i>	'corner of the animals'
Ø/L-H H	103. <i>bwòdgú ikágó</i>	'melon of the children'
Ø/L-H H (CV)	104. <i>wáágó ócúdú</i>	'(vegetable) of the animals'
Ø/L-H H (CVC)	105. <i>nyákýkád ócúdú</i>	'brave man of the animals'
Ø/L-H	106. <i>kúádú ócúdú</i>	'purchase of the animals'
Ø/L-L HL	107. <i>fúmbyá lócúdú</i>	'dust of the animals'
Ø/CV HL	108. <i>fùdáì ócúdú</i>	'corpse of the animals'
Ø/L-H HL	109. <i>cúáhlí lócúdú</i>	'(ant) of the animals'
Ø/CV HL	110. <i>jáwáì ócúdú</i>	'thief of the animals'

(Classes 1, 9, 10 - No concord)

L-L	111. <i>bàágé ócúdú</i>	'hot pepper of the animals'
L-H L	112. <i>cúnđé ócúdú</i>	'chief of the animals'
L-L H	113. <i>mpùmá ócúdú</i>	'seed (mass) of the animals'
L-H H (CV)	114. <i>cídú ikágó</i>	'animal of the children'
L-H H (CVC)	115. <i>káámbúg ócúdú</i>	'(ant) of the animals'
L-H	116. (not attested)	
L-L HL	117. <i>ncàmá ikágó</i>	'(tree) of the children'
L-CV HL	118. <i>ncwòmbó lócúdú</i>	'hot pepper of the animals'
L-H HL	119. <i>zhúgá ócúdú</i>	'limit of the animals'
L-CV HL	120. <i>nykúmbái ócúdú</i>	'diarrhea of the animals'

Chart D: N2 = V-L

N1 + N2 = V-L

(Classes 4, 6 - H concord with CV marker)

CV-L	121. <i>màbùdè má óŋkàsà</i>	'potatoes of the (birds)'
CV-H L	122. <i>màbúgà má óŋkàsà</i>	'corners of the (birds)'
CV-L H	123. <i>màbwòdògú má óŋkàsà</i>	'melons of the (birds)'
CV-H H	(CV) 124. <i>màwáágó má óŋkàsà</i>	'(vegetables) of the (birds)'
	(CVC) 125. <i>míjkúŋkúd mí óŋkàsà</i>	'brave men of the (birds)'
CV-H	126. <i>míkásá mí óŋkàsà</i>	'widows of the (birds)'
CV-L HL	(CV) 127. <i>mífùmbyá lmí óŋkàsà</i>	'dusts of the (birds)'
	(CVC) 128. (not attested)	
CV-H HL	(CV) 129. <i>micúlú lmí óŋkàsà</i>	'(ants) of the (birds)'
	(CV) 130. <i>mlíndál mí óŋkàsà</i>	'searchings of the (birds)'

(Classes 2, 8 - H concord with V marker)

V-L	131. <i>ikàáfè t óŋkàsà</i>	'macabos of the (birds)'
V-H L	132. <i>ófúgà ó ígùlá</i>	'(ants) of the bananas'
V-L H	133. <i>ibùmá t óŋkàsà</i>	'seeds of the (birds)'
V-H H	(CV) 134. <i>óciúdú ó ígùlá</i>	'animals of the bananas'
	(CVC) 135. <i>ókáámbúg ló ígùlá</i>	'(ants) of the bananas'
V-H	136. <i>ókúwó ó ígùlá</i>	'chickens of the bananas'
V-L H	(CV) 137. <i>íjilá lí óŋkàsà</i>	'replacements of the (birds)'
	(CVC) 138. <i>íjùdál í óŋkàsà</i>	'cadavers of the (birds)'
V-H HL	(CV) 139. <i>óncédé ló ígùlá</i>	'(hot peppers) of the bananas'
	(CVC) 140. <i>íjúwáí t óŋkàsà</i>	'thieves of the (birds)'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L	141. <i>bùdè óŋkàsà</i>	'potato of the (birds)'
Ø/L-H L	142. <i>búgà óŋkàsà</i>	'corner of the (birds)'
Ø/L-L H	143. <i>bwòdògú ígùlá</i>	'melon of the bananas'
Ø/L-H H	(CV) 144. <i>wáágó óŋkàsà</i>	'(vegetable) of the (birds)'
	(CVC) 145. <i>ýkúŋkúd óŋkàsà</i>	'brave man of the (birds)'
Ø/L-H	146. <i>kásá óŋkàsà</i>	'widow of the (birds)'
Ø/L-L HL	(CV) 147. <i>fúmbyá lóŋkàsà</i>	'dust of the (birds)'
	(CVC) 148. <i>fùdál óŋkàsà</i>	'cadaver of the (birds)'
Ø/L-H HL	(CV) 149. <i>cíúlú lóŋkàsà</i>	'(ant) of the (birds)'
	(CVC) 150. <i>júwáí óŋkàsà</i>	'thief of the (birds)'

(Classes 1, 9, 10 - No concord)

L-L	151. <i>bàágé ígùlá</i>	'hot pepper of the bananas'
L-H L	152. <i>cíndyé óŋkàsà</i>	'chief of the (birds)'
L-L H	153. <i>mpùmá óŋkàsà</i>	'seed (mass) of the (birds)'
L-H H	(CV) 154. <i>cídú ígùlá</i>	'animal of the bananas'
	(CVC) 155. <i>káámbúg ígùlá</i>	'(ant) of the bananas'
L-H	156. (not attested)	
L-L HL	(CV) 157. <i>ncámá óŋkàsà</i>	'(tree) of the (birds)'
	(CVC) 158. <i>ncwòmboí ígùlá</i>	'(hot pepper) of the bananas'
L-H HL	(CV) 159. <i>zhúgá óŋkàsà</i>	'limit of the (birds)'
	(CVC) 160. <i>ýkúmbái óŋkàsà</i>	'diarrhea of the (birds)'

Chart E: N2 = L-H H

N1 + N2 = L-H H

(Classes 4, 6 - H concord with CV marker)

CV-L	161. <i>miflùdyè mi cùdú</i>	'sticks of the animal'
CV-L L	162. <i>màbwùgà mò cùdú</i>	'corners of the animal'
CV-L H	163. <i>màbwòdgú mó cùdú</i>	'melons of the animal'
CV-H H	164. <i>màwáágó mó cùdú</i>	'(vegetables) of the animal'
(CVC)	165. <i>miyákújákád ml cùdú</i>	'brave men of the animal'
CV-H	166. <i>mikúsá mí cùdú</i>	'widows of the animal'
CV-L HL	167. <i>miflùmbyá lmí cùdú</i>	'dusts of the animal'
(CVC)	168. (not attested)	
CV-H HL	169. <i>mictúúlì lml cùdú</i>	'(ants) of the animal'
(CVC)	170. <i>milúndál mí cùdú</i>	'searchings of the animal'

(Classes 2, 8 - H concord with V marker)

V-L	171. <i>ikáásfè t cùdú</i>	'macabos of the animal'
V-H L	172. <i>ófágè ò cùdú</i>	'(ants) of the animal'
V-L H	173. <i>ibùmá t cùdú</i>	'seeds of the animal'
V-H H	174. <i>ikágá t cùdú</i>	'children of the animal'
(CVC)	175. <i>ókáámbúg ló cùdú</i>	'(ants) of the animal'
V-H	176. <i>ókúwó ó cùdú</i>	'chickens of the animal'
V-L HL	177. <i>ijilá lí cùdú</i>	'replacements of the animal'
(CVC)	178. <i>ifùdál t cùdú</i>	'corpses of the animal'
V-H HL	179. <i>òncédé ló cùdú</i>	'(hot peppers) of the animal'
(CVC)	180. <i>ijúwáí t cùdú</i>	'thieves of the animal'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L	181. <i>bùdè cùdú</i>	'potato of the animal'
Ø/L-H L	182. <i>búgá cùdú</i>	'corner of the animal'
Ø/L-L H	183. <i>bwòdgú cùdú</i>	'melon of the animal'
Ø/L-H H	184. <i>wáágé cùdú</i>	'(vegetable) of the animal'
(CVC)	185. <i>ykáájkúd cùdú</i>	'brave man of the animal'
Ø/L-H	186. <i>kásá cùdú</i>	'widow of the animal'
Ø/L-L HL	187. <i>fúmbyá lcùdú</i>	'dust of the animal'
(CVC)	188. <i>fùdál cùdú</i>	'corpse of the animal'
Ø/L-H HL	189. <i>cúúlì lcùdú</i>	'(ant) of the animal'
(CVC)	190. <i>júwáí cùdú</i>	'thief of the animal'

(Classes 1, 9, 10 - No concord)

L-L	191. <i>bàágé cùdú</i>	'hot pepper of the animal'
L-H L	192. <i>cúnídè cùdú</i>	'chief of the animal'
L-L H	193. <i>mpùmá cùdú</i>	'seed (mass) of the animal'
L-H H	194. <i>mpándú cùdú</i>	'(mouse) of the animal'
(CVC)	195. <i>káámbig ú cùdú</i>	'(ant) of the animal'
L-H	196. (not attested)	
L-H L	197. <i>ncámá lcùdú</i>	'(tree) of the animal'
(CVC)	198. <i>ncwòmbólí cùdú</i>	'hot pepper of the animal'
L-H HL	199. <i>zhúgá lcùdú</i>	'limit of the animal'
(CVC)	200. <i>ykúmbál cùdú</i>	'diarrhea of the animal'

Chart F: N2 = L-L

N1 + N2 = L-L

(Classes 4, 6 - H concord with CV marker)

CV-L	201. mābūdē má ñkàsà	'potatoes of the (bird)'
CV-H L	202. mābúgà má ñkàsà	'corners of the (bird)'
CV-L H	203. mābwòdgú má ñkàsà	'melons of the (bird)'
CV-H H	(CV) 204. māwáágá má ñkàsà	'(vegetables) of the (bird)'
	(CVC) 205. miñkáñkád mí ñkàsà	'brave men of the (bird)'
CV-H	206. mikúsá mí ñkàsà	'widows of the (bird)'
CV-L HL	(CV) 207. miñjumbýa /mí ñkàsà	'dusts of the (bird)'
	(CVC) 208. (not attested)	
CV-H HL	(CV) 209. miçúúlú /mí ñkàsà	'(ants) of the (bird)'
	(CVC) 210. milándál mí ñkàsà	'searchings of the (bird)'

(Classes 2, 8 - H concord with V marker)

V-L	211. ikàáfè í ñkàsà	'macabos of the (bird)'
V-H L	212. ófúgá ó ñkàsà	'(ants) of the (bird)'
V-L H	213. ibùmá í ñkàsà	'seeds of the (bird)'
V-H H	(CV) 214. ikágá í ñkàsà	'children of the (bird)'
	(CVC) 215. ókáámbúg ló ñkàsà	'(ants) of the (bird)'
V-H	216. ókúwó ó ñkàsà	'chickens of the (bird)'
V-L HL	(CV) 217. iñílá lí ñkàsà	'replacements of the (bird)'
	(CVC) 218. ifúdál í ñkàsà	'cadavers of the (bird)'
V-H HL	(CV) 219. oncédé ló ñkàsà	'(hot peppers) of the (bird)'
	(CVC) 220. iñuwái í ñkàsà	'thieves of the (bird)'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L	221. búdë ñkàsà	'potato of the (bird)'
Ø/L-H L	222. búgä ñkàsà	'corner of the (bird)'
Ø/L-L H	223. bwòdgú ñkàsà	'melon of the (bird)'
Ø/L-H H	(CV) 224. wáágá ñkàsà	'(vegetable) of the (bird)'
	(CVC) 225. ñkáñkád ñkàsà	'brave man of the (bird)'
Ø/L-H	226. kúrá ñkàsà	'widow of the (bird)'
Ø/L-L HL	(CV) 227. fúmbyá ñkàsà	'dust of the (bird)'
	(CVC) 228. júdál ñkàsà	'cadaver of the (bird)'
Ø/L-H HL	(CV) 229. cíúúlú ñkàsà	'(ant) of the (bird)'
	(CVC) 230. júwái ñkàsà	'thief of the (bird)'

(Classes 1, 9, 10 - No concord)

L-L	231. ncágá ñkàsà	'firewood of the (bird)'
L-H L	232. cíndyé ñkàsà	'chief of the (bird)'
L-L H	233. mpúlmá ñkàsà	'seed (mass) of the (bird)'
L-H H	(CV) 234. cídú ñkàsà	'animal of the (bird)'
	(CVC) 235. káámbúg ñkàsà	'(ant) of the (bird)'
L-H	236. (not attested)	
L-L HL	(CV) 237. ncáamá ñkàsà	'(tree) of the (bird)'
	(CVC) 238. ncwòmból ñkàsà	'(hot pepper) of the (bird)'
L-H HL	(CV) 239. zhúgá ñkàsà	'limit of the (bird)'
	(CVC) 240. ñkúmbál ñkàsà	'diarrhea of the (bird)'

Chart G: N2 = Ø H

N1 + N2 = Ø H

(Classes 4, 6 - H concord with CV marker)

CV-L	241. <i>mèbùdè má cáánzá</i>	'potatoes of the broth'
CV-H L	242. <i>mèbúgá má cáánzá</i>	'corners of the broth'
CV-L H	243. <i>mèbwòdògú má cáánzá</i>	'melons of the broth'
CV-H H	(CV) 244. <i>màwáágá má cáánzá</i>	'(ants) of the broth'
	(CVC) 245. <i>miykújkúd mí cáánzá</i>	'brave men of the broth'
CV-H	246. <i>mikúsá mí cáánzá</i>	'widows of the broth'
CV-L HL	(CV) 247. <i>miyúmbyá lmi cáánzá</i>	'dusts of the broth'
	(CVC) 248. (not attested)	
CV-H HL	(CV) 249. <i>micúlú lmi cáánzá</i>	'(ants) of the broth'
	(CVC) 250. <i>millándá! mí cáánzá</i>	'searchings of the broth'

(Classes 2, 8 - H concord with V marker)

V-L	251. <i>ikààfè i cáánzá</i>	'macabos of the broth'
V-H L	252. <i>òjúgá ó cáánzá</i>	'(ants) of the broth'
V-L H	253. <i>ibùmá! i cáánzá</i>	'seeds of the broth'
V-H H	(CV) 254. <i>ikágá i cáánzá</i>	'children of the broth'
	(CVC) 255. <i>òkáámbígá ló cáánzá</i>	'(ants) of the broth'
V-H	256. <i>òkúwó ó cáánzá</i>	'chickens of the broth'
V-L HL	(CV) 257. <i>ijilá! !í cáánzá</i>	'replacements of the broth'
	(CVC) 258. <i>ifùdál i cáánzá</i>	'cadavers of the broth'
V-H HL	(CV) 259. <i>òncédé ló cáánzá</i>	'(hot peppers) of the broth'
	(CVC) 260. <i>ijúwá! i cáánzá</i>	'thieves of the broth'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L	261. <i>bùdè cáánzá</i>	'potato of the broth'
Ø/L-H L	262. <i>búgá cáánzá</i>	'corner of the broth'
Ø/L-L H	263. <i>bwòdògú cáánzá</i>	'melon of the broth'
Ø/L-H H	(CV) 264. <i>wáágá cáánzá</i>	'(ant) of the broth'
	(CVC) 265. <i>nykújkúd cáánzá</i>	'brave man of the broth'
Ø/L-H	266. <i>kúsá cáánzá</i>	'widow of the broth'
Ø/L-L HL	(CV) 267. <i>fúmbyá !cáánzá</i>	'dust of the broth'
	(CVC) 268. <i>fùdál cáánzá</i>	'cadaver of the broth'
Ø/L-H HL	(CV) 269. <i>cúlú! !cáánzá</i>	'(ant) of the broth'
	(CVC) 270. <i>júwá! cáánzá</i>	'thief of the broth'

(Classes 1, 9, 10 - No concord)

L-L	271. <i>ncágá cáánzá</i>	'firewood of the broth'
L-H L	272. <i>cúnídé cáánzá</i>	'chief of the broth'
L-L H	273. <i>mpùmá cáánzá</i>	'seed (mass) of the broth'
L-H H	(CV) 274. <i>mpándú cáánzá</i>	'(mouse) of the broth'
	(CVC) 275. <i>káámbúgá ù cáánzá</i>	'(ant) of the broth'
L-H	276. (not attested)	
L-L HL	(CV) 277. <i>ncámá! !cáánzá</i>	'(tree) of the broth'
	(CVC) 278. <i>ncwòombó! cáánzá</i>	'(hot pepper) of the broth'
L-H HL	(CV) 279. <i>zhúgá !cáánzá</i>	'limit of the broth'
	(CVC) 280. <i>nykúmbá! cáánzá</i>	'diarrhea of the broth'

Chart H: N2 = \emptyset N1 + N2 = \emptyset

(Classes 4, 6 - H concord with CV marker)

CV-L	281. <i>màbùdè</i> <i>má</i> <i>jùgà</i>	'potatoes of the plug'
CV-H L	282. <i>màbúgà</i> <i>má</i> <i>jùgà</i>	'corners of the plug'
CV-L H	283. <i>màbwòdgú</i> <i>má</i> <i>jùgà</i>	'melons of the plug'
CV-H H	284. <i>màwáággá</i> <i>má</i> <i>jùgà</i>	'snails of the plug'
	(CVC) 285. <i>mìyákáñkád</i> <i>mí</i> <i>jùgà</i>	'brave men of the plug'
CV-H	286. <i>míkúsá</i> <i>mí</i> <i>jùgà</i>	'widows of the plug'
CV-L HL	287. <i>mífumbyá</i> <i>lmí</i> <i>jùgà</i>	'dusts of the plug'
	(CVC) 288. (not attested)	
CV-H HL	289. <i>míciúlú</i> <i>lmí</i> <i>jùgà</i>	'(ants) of the plug'
	(CVC) 290. <i>mílündál</i> <i>mí</i> <i>jùgà</i>	'searchings of the plug'

(Classes 2, 8 - H concord with V marker)

V-L L	291. <i>ikàáfè</i> <i>i</i> <i>jùgà</i>	'macabos of the plug'
V-H L	292. <i>ófíigà</i> <i>ó</i> <i>jùgà</i>	'(ants) of the plug'
V-L H	293. <i>ibúmá</i> <i>i</i> <i>jùgà</i>	'seeds of the plug'
V-H H	294. <i>óciúdú</i> <i>ó</i> <i>jùgà</i>	'animals of the plug'
	(CVC) 295. <i>ókáámbág</i> <i>ló</i> <i>jùgà</i>	'(ants) of the plug'
V-H	296. <i>ókúwó</i> <i>ó</i> <i>jùgà</i>	'chicken of the plug'
V-L HL	297. <i>ijilá</i> <i>l!</i> <i>jùgà</i>	'replacements of the plug'
	(CVC) 298. <i>ifádál</i> <i>i</i> <i>jùgà</i>	'cadavers of the plug'
V-H HL	299. <i>óncédé</i> <i>ló</i> <i>jùgà</i>	'(hot peppers) of the plug'
	(CVC) 300. <i>íjúwál</i> <i>i</i> <i>jùgà</i>	'thieves of the plug'

(Classes 3, 5, 7 - H concord with only tone)

Ø/L-L	301. <i>bùdè</i> <i>jùgà</i>	'potato of the plug'
Ø/L-H L	302. <i>búgà</i> <i>jùgà</i>	'corner of the plug'
Ø/L-L H	303. <i>bwòdgú</i> <i>jùgà</i>	'melon of the plug'
Ø/L-H H	304. <i>wáágà</i> <i>jùgà</i>	'(vegetable) of the plug'
	(CVC) 305. <i>ykáújkád</i> <i>jùgà</i>	'brave man of the plug'
Ø/L-H	306. <i>kúss</i> <i>jùgà</i>	'widow of the plug'
Ø/L-L HL	307. <i>fùmbyá</i> <i>jùgà</i>	'dust of the plug'
	(CVC) 308. <i>fùdál</i> <i>jùgà</i>	'cadaver of the plug'
Ø/L-H HL	309. <i>cíulú</i> <i>jùgà</i>	'(ant) of the plug'
	(CVC) 310. <i>júwál</i> <i>jùgà</i>	'thief of the plug'

(Classes 1, 9, 10 - No concord)

L-L	311. <i>ncàgà</i> <i>jùgà</i>	'firewood of the plug'
L-H L	312. <i>cíndyé</i> <i>jùgà</i>	'chief of the plug'
L-L H	313. <i>mpúmá</i> <i>jùgà</i>	'seed (mass) of the plug'
L-H H	314. <i>cídú</i> <i>jùgà</i>	'animal of the plug'
	(CVC) 315. <i>káámbág</i> <i>jùgà</i>	'(ant) of the plug'
L-H	316. (not attested)	
L-L HL	317. <i>ncámá</i> <i>jùgà</i>	'(tree) of the plug'
	(CVC) 318. <i>ncwòmból</i> <i>jùgà</i>	'(hot pepper) of the plug'
L-H HL	319. <i>zhúgá</i> <i>jùgà</i>	'limit of the plug'
	(CVC) 320. <i>ykáumbál</i> <i>jùgà</i>	'diarrhea of the plug'

Description tonologique de l'énoncé nominal associatif en kako

Urs Ernst

Résumé

Cet article concerne le kako, une langue parlée dans l'est du Cameroun et appartenant au groupe des langues bantu. Il présente et analyse les réalisations tonales des noms kako au singulier dans le contexte de l'énoncé nominal associatif (génitif). Après l'identification des oppositions tonales le phénomène d'alternance est étudié. Ici l'objectif était d'aboutir dans la mesure du possible à déterminer les formes tonales de base des noms et d'expliquer l'apparition des variantes par l'application de règles de réalisation.

Abstract

This study looks at Kako, a Bantu language from Eastern Cameroon. It presents and analyzes the tonal realizations of singular nouns in the context of the associative (genitive) construction. After the identification of the tonal oppositions, the phenomenon of alternation is studied. The objective here was to determine, as far as possible, the underlying tonal forms of the nouns and to explain the appearance of the tonal variants by application of rules.

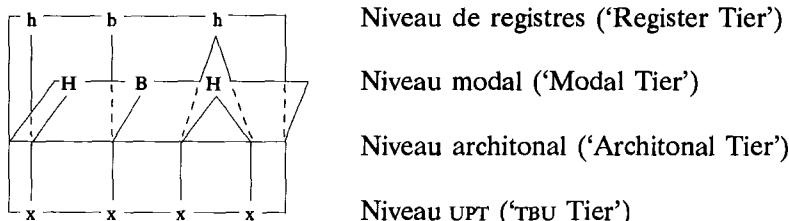
La langue kako parlée au Cameroun dans le département de la Kadey (Province de l'Est), ainsi que dans la région voisine de la République Centrafricaine (autour de Gamboula), est classée par Guthrie (1971:34) sous A.93 dans les langues bantu, et sous no. 237 dans ALCAM (Dieu et Renaud, 1983:25).

Cette étude,¹ constituant, à notre connaissance, la première et jusqu'à présent la seule tentative de décrire les phénomènes tonologiques de la langue kako, poursuit un double objectif. En premier lieu, elle plaide pour un système tonal à deux tonèmes fondamentaux, à savoir un tonème haut (H) et un tonème bas (B). En second lieu, elle cherche à décrire les réalisations tonales du nom non composé dans le contexte de l'énoncé associatif singulier du type N1N2 (sg de sg). Nous avons d'abord établi les formes de base qui servaient de point de départ pour l'analyse. Ces schémas ont été établis en fonction de leurs diverses réalisations dans le contexte de l'énoncé associatif. Par l'application de règles de réalisations nous avons cherché à expliquer l'apparition des alternances pour chaque unité lexique considérée.

Le modèle appelé 'Register Tier'² en anglais que nous employons pour la description des traits tonals implique une représentation à trois dimensions. Dans le diagramme ci-dessous, les lettres majuscules indiquent les modes respectivement haut (H) et bas (B) constituant le niveau modal tandis que les lettres minuscules indiquent les registres respectivement haut (h) et bas (b) constituant le niveau des registres.

¹Nous avons été inspirés dans notre étude par M. Keith Snider ainsi que par le Professeur Thilo Schadeberg, tous les deux de l'Université de Leiden/Pays-Bas. C'est surtout en étroite collaboration avec M. Keith Snider que ce travail a pu être réalisé. La partie principale de cette étude a été faite pendant un séminaire sur le ton organisé par la Société Internationale de Linguistique (SIL) du 23 janvier au 17 mars 1989 à Yaoundé. L'étude se situe dans le cadre des programmes de recherche entrepris par le Centre de Recherches et d'Etudes Anthropologiques (CREA) et a été effectuée sous l'autorisation de recherche n° 22/1987 accordée par le Ministère de l'Enseignement Supérieur, de l'Informatique et de la Recherche Scientifique. Notre reconnaissance va en premier lieu à la Direction du Ministère de l'Enseignement Supérieur, de l'Informatique et de la Recherche Scientifique ainsi qu'au Gouvernement Camerounais qui ont permis que cette étude soit entreprise. Nous tenons ensuite à exprimer ici toute notre gratitude envers M. Keith Snider ainsi qu'au Professeur Thilo Schadeberg. Notre reconnaissance va aussi à nos collègues de la Société Internationale de Linguistique, notamment le Dr. Stephen Anderson qui a relu et annoté le manuscrit ainsi qu'à Mme Carol Holmes qui a vérifié le français. Enfin, cette étude n'a été possible que grâce à l'aide, à la patience et aussi au dévouement extraordinaire de M. David-Diderot Kombo Dee qui nous a fourni l'essentiel du corpus. Qu'il en soit remercié de façon particulière.

²Ce modèle a été développé par Keith Snider. Nous devons le diagramme ainsi que l'explication du modèle et de la théorie à son article intitulé "Towards the Representation of Tone: A Three-Dimensional Approach" (1988). La terminologie française utilisée dans l'explication du modèle ainsi que de la théorie est la nôtre. N'ayant pas encore rencontré cette théorie en usage par un linguiste francophone, nous étions obligés de traduire les termes originaux de l'anglais. Nous avons ajouté ces derniers entre parenthèses.

(1) Représentation tonale à 3 dimensions³

La représentation du ton implique au moins quatre niveaux autosegmentaux: un niveau de registre, un niveau modal, un niveau architonal et un niveau d'unités porteuses de ton (UPT). Ces niveaux sont, comme le montre le diagramme ci-dessus, arrangés sous forme d'une configuration géométrique. Le niveau modal est nommé ainsi à cause des deux modes qui lui sont associés, à savoir un mode supérieur représenté par H et un mode inférieur représenté par b. Le niveau de registres reçoit son nom dû au fait que des 'registres' ou des degrés de hauteur tonal lui sont associés. Les traits de ce niveau sont représentés par b (registre suivant est plus bas que le registre précédent) et h (registre suivant est plus haut que le registre précédent). La différence entre les traits au niveau modal et ceux au niveau de registres est cruciale. Deux b's consécutifs au niveau modal n'entraîneront pas de changement. Deux b's au niveau de registre, par contre, indiquent qu'un noeud architonal associé au second b est associé à un registre plus bas par rapport au noeud architonal associé au premier b. Cette particularité peut être illustré sous forme schématisée.

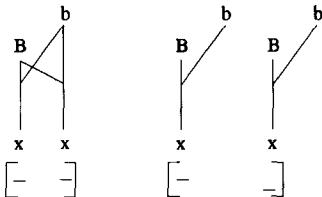
³

- limite du morphème ou du mot
- ton(s) ponctuel(s)
- ton modulé (descendant)
- ligne associative originale
- nouvelle ligne associative
- ++ ligne associative coupée
- devient

]] indique la fin du morphème ou du mot

]]] indique la fin d'énoncé

(2) Faille du ton bas

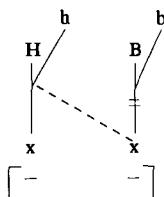


En outre, il a été proposé un niveau architonal nommé ainsi parce que, du point de vue hiérarchique, il domine sur le niveau modal ainsi que le niveau de registres. Les noeuds du niveau architonal, étant purement structurels, réunissent les traits au niveau modal et les traits au niveau de registres avec les unités porteuses de ton (x) au niveau des UPTs.

Un des avantages principaux de ce modèle autosegmental est, selon Snider, qu'il est en mesure de représenter des processus assimilatoires comme des processus de propagation ('spreading' en anglais). Ainsi, des processus d'assimilation totale (par ex. $B \rightarrow H$) peuvent être considérés comme propagation d'un noeud au niveau architonal vers un noeud au niveau UPT.

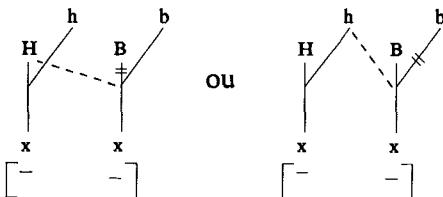
Il convient ici d'expliquer brièvement les conventions suivies dans les diagrammes employés dans cette étude. Les lignes non interrompues indiquent des relations associatives qui, d'une part, lient des traits tonologiques différents entre eux (par ex. B et b) et, d'autre part, lient ces traits tonologiques avec les éléments segmentaux, porteurs de tons (x). Les lignes pointillées représentent des nouvelles relations associatives qui impliquent en même temps la rupture d'anciennes relations associatives ce qui est symbolisée par le signe // sur la ligne.

(3) Assimilation totale



Des processus d'assimilation partielle (par ex. $H \rightarrow M$), par contre, peuvent être considérés comme propagation d'un trait soit au niveau modal, soit au niveau de registres vers le noeud au niveau architonal.

(4) Assimilation partielle

1. La structure syllabique du nom *kakɔ*

Le radical nominal en *kakɔ* a la forme cv, cy, cvc ou cvcv.⁴ Toute voyelle est porteuse d'un ton ponctuel, soit haut, soit bas. Le radical nominal est précédé au pluriel par un morphème *bè-* dans le cas des noms désignant soit un être animé, soit un corps céleste, et par *mè-* dans tout autre cas. Le singulier n'est pas marqué au niveau segmental, à moins qu'on veuille poser un marqueur Ø-. Les morphèmes *bè-* et *mè-* peuvent être identifiés comme des marqueurs de classe nominale bantu. On constatera qu'en dehors de ces deux marqueurs, il n'existe pas d'autres au niveau du nom, au moins pas au niveau segmental. En sommaire, on constatera que le système des classes nominales en *kakɔ* est très rudimentaire. Ce qui a été dit plus haut peut être résumé comme suit.

(5) Radicaux nominaux en *kakɔ*

forme syllabique	singulier	pluriel	signification
CV	<i>kɔ</i>	<i>bè-kɔ</i>	'célibataire'
	<i>gà</i>	<i>mè-gà</i>	'junc'
CVC	<i>kòn</i>	<i>bè-kòn</i>	'ver parasite'
	<i>kàl</i>	<i>mè-kàl</i>	'plante à bulbe'
CVCV	<i>njòkù</i>	<i>bè-njòkù</i>	'éléphant'
	<i>dúmɔ</i>	<i>mè-dúmɔ</i>	'kapokier'

Dans le cas des noms du type cvc, il faut préciser que la consonne finale est une sonante. Peuvent seulement figurer dans cette position les consonnes *m*, *n*, *ŋ*, *l*, *y*, et *w*.

⁴C consonne, C2 classe nominale 2, Ø morphème à valeur zéro, pl pluriel, s sonante, sg singulier, V voyelle, Y voyelle nasalisée, (') ton haut, (") ton bas, (") ton bas-montant, (") ton haut-descendant

2. Ton haut et ton bas

Comme nous l'avons déjà mentionné, la langue *kakɔ* est une langue à deux tons distinctifs, à savoir haut et bas. Ces tons sont une particularité de la syllabe. Toute syllabe en *kakɔ* est réalisée par un noyau vocalique. Il n'existe pas de consonnes syllabiques porteuses de ton en *kakɔ*. Les deux tons de base sont identifiés par des oppositions telles que les suivantes.

(6) L'opposition haut/bas

<i>bé</i>	'trou'	<i>bè</i>	'éructer'
<i>tá</i>	'neveu'	<i>tà</i>	'consulter voyant'
<i>ká</i>	'avarice'	<i>kà</i>	'tabac'
<i>sé</i>	'parasolier'	<i>sè</i>	'cour'
<i>dúŋ</i>	'asticot'	<i>dùŋ</i>	'moustique'
<i>ndóŋ</i>	'piment'	<i>ndòŋ</i>	'source'
<i>sóŋ</i>	'envoûtement'	<i>sòŋ</i>	'mort'
<i>nyéy</i>	'bassin'	<i>nyèy</i>	'ongle'
<i>kóló</i>	'famine'	<i>kòlò</i>	'crabe'
<i>sángwé</i>	'père'	<i>sàngwè</i>	'mélanger'
<i>làndá</i>	'esp. d'arbre'	<i>làndà</i>	'fourmiller'
<i>kànó</i>	'conte'	<i>kànò</i>	'adorer'
<i>lándà</i>	'fourmi'	<i>làndà</i>	'fourmiller'
<i>kúsò</i>	'veuf'	<i>kùsò</i>	'créer'

Les oppositions tonales en *kakɔ* sont relativement peu nombreuses. Nous avons relevé, dans un corpus de 1500 unités lexicales (noms et verbes), un total de 94 oppositions dont 44 oppositions nominales, 10 oppositions verbales et 40 oppositions nom/verbe.

C'est sur la base des exemples tels que ceux présentés (6) que nous avons conclu à l'existence des traits oppositionnels 'haut' et 'bas.' Au niveau tonétique cependant, on peut parfois distinguer jusqu'à quatre contours différents comprenant plusieurs hauteurs tonales. L'analyse expérimentelle des cinq énoncés à l'aide d'un instrument électronique, appelé 'Speech Analyzer' en anglais, a produit les résultats suivants. Nous n'indiquons que les valeurs de l'unité nominale *mbà* 'civette.' Les chiffres sont en hertz.

(7) Réalisations tonétiques de l'unité lexicale *mbà* 'civette'

- A [] 107 97 '(la) civette'
- B [] 109 133 'la civette de Kombo'
- C [] 110 'la civette du père'
- D [] 135 111 'la peau de la civette'

On remarquera que la distinction de quatre contours tonales différents réalisés par l'unité nominale *mbà* ne révèle pas l'existence de quatre unités différentes du point de vue sémantique; elle résulte plutôt des procès tonologiques qui interviennent dans des constructions déterminées. Ainsi, dans les exemples ci-dessus, les réalisations tonétiques de *mbà* sont conditionnées par les facteurs suivants.

(8) Facteurs conditionnant la forme tonale de *mbà*

Quant à A, *mbà* en isolation est réalisé bas-descendant. La descente du ton bas constitue d'ailleurs, selon Hombert (1976:109-21) le signal perceptif primaire d'un ton tonologiquement bas. Autrement dit, tout ton réalisé comme ton bas ponctuel et donc dépourvu de faille n'est pas vraiment bas du point de vue tonologique.

Quant à B, dans la construction associative du type N1N2 (unité nominale N1 suivie par unité nominale N2) un ton bas est réalisé bas-montant en position N1 devant une unité nominale dont la forme de base est BBB.

Quant à C, dans l'énoncé associatif du type N₁N₂ un ton bas est réalisé bas en position N₁ devant une unité nominale dont la structure tonale n'est pas pBB.

Quant à D, dans la construction associative du type N₁N₂ un ton bas est réalisé haut-descendant en position finale N₂.

En sommaire, on peut dire que la forme tonétique de l'unité nominale *mbà* est conditionnée par (a) le contexte immédiat de l'unité nominale, soit isolation (A), soit non-isolation (B-D), par (b) la position de l'unité au sein de l'énoncé, soit N₁ (B, C) soit N₂ (D) et enfin par (c) la forme de base de l'unité nominale N₂, soit pBB (B) soit non pBB (C).

3. Formes de base et alternances

La description du système tonal d'une langue comprend premièrement l'identification des oppositions tonales. Nous les avons décrites sous §2. Ensuite, elle inclut une explication de phénomènes tels que nous venons de signaler ci-dessus.

Le but de cette section est de décrire les phénomènes d'alternance ainsi que les règles de réalisation tonale. Cette étude sera menée sur la base de la construction associative au singulier. Il est espéré, cependant, que les résultats de cette étude d'un cas limité serviront à comprendre les principales règles de réalisation du *kakò* standard (dialecte *nygbakò*). Il va sans dire qu'une future étude plus approfondie du système tonal aura comme objectif principal d'appliquer les règles de réalisation établies ici à d'autres types d'énoncés, simples et complexes. De cette étude-là il pourrait bien résulter la nécessité (a) de modifier les formes de base proposées ou d'en postuler d'autres, (b) de modifier les règles de réalisation tonale.

Il convient d'expliquer brièvement la notion d'alternance. L'exemple suivant montre la nécessité de prendre cette notion en considération dans la description du système tonal du *kakò*:



mapi sangwe
le bagage du père



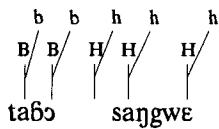
mapi dyɔmbu
le bagage de la soeur (frère)

On remarquera qu'un ton bas et un ton haut alternent sur la voyelle finale d'un même signifiant: *màpi* ~ *màpí*. Il est évident que le choix entre les deux variantes dépendra de l'unité nominale suivante.

Lorsqu'il s'agit de décrire les alternances tonales que subissent une ou plusieurs unités lexicales au sein d'un énoncé, on prend comme point de départ la (les) forme(s) de base correspondante(s). Il faut ensuite établir des règles de réalisation qui, par leur application, expliquent l'apparition des variantes.

Avant de décrire les alternances tonales des unités lexicales nominales, il convient de présenter le contexte dans lequel ces alternances ont été étudiées. Comme nous l'avons déjà dit, notre étude se base et se limite sur l'énoncé associatif du type NIN2. Nous n'en considérerons que le singulier (10).

(10) Un exemple de l'énoncé associatif considéré



chèvre père
la chèvre du père

On remarquera que l'énoncé associatif considéré ici est caractérisé par un marqueur associatif constitué par un ton haut flottant h° . C'est surtout ce ton flottant qui provoque des alternances variées selon la forme de base du nom en question. On notera que le ton haut flottant en kako peut se propager, selon le cas, vers la droite ou vers la gauche.

3.1. Les formes de base. Nous distinguons entre les formes tonales de base suivantes. Elles ont été établies en fonction de leur réalisations respectives dans l'énoncé associatif. Autrement dit, l'étude de telle ou telle

réalisation tonale d'un nom donné nous a amenés à postuler telle ou telle forme de base.

(11) Les formes de base des noms *kakɔ*

Structure

syll. des

radicaux nominaux	Forme de base	Réalisation phonétique	Exemples
CV	B	[_]	<i>mbà</i> ‘civette’
	H	[-]	<i>só</i> ‘ami’
	BH	[_ -]	<i>kì</i> ‘beau-père’
	HB	[- _]	<i>mbò</i> ‘souris’
CVC	HB	[_ -]	<i>mbàm</i> ‘homme’
CVCV	BB	[_ - -]	<i>tàbò</i> ‘chèvre’
	HH	[- -]	<i>sósó</i> ‘canard’
	HB	[- -]	<i>lándà</i> ‘fourmi’
	HBH	[- _ -]	<i>kúbè</i> ‘poule’
	BH	[_ -]	<i>kònđó</i> ‘peau’
	BBB	[_ - -]	<i>ndùmò</i> ‘tambour’

On remarquera qu'en dehors des deux tons bas (B) et haut (H) deux tons flottants ont été posés: H et B. La forme de base HB représente deux types de structures syllabiques différentes, à savoir CV et CVC.

3.2. Les alternances tonales. Dans l'énoncé associatif tout nom *kakɔ* a sa réalisation tonétique caractéristique en fonction de (a) la position qu'occupe ce nom (respectivement N1 et N2) et de (b) la nature tonologique du nom avec lequel il se combine.

Dans cette section nous présenterons toutes les réalisations tonétiques attestées dans l'énoncé associatif étudié. Toutes les possibilités combinatoires entre les formes de base présentées en haut seront considérées. Nous présenterons les alternances sous forme de quatre tableaux (13, 15–17) selon la structure syllabique des radicaux nominaux. L'ordre de présentation sera le suivant:

(12) Structures syllabiques de l'énoncé associatif étudié

N1	N2
CV(C)	CV(C)
CV(C)	CVCV
CVCV	CV(C)
CVCV	CVCV

Les réalisations tonétiques dans les tableaux (13–17) sont représentées par les symboles suivants: **B** (bas); **H** (haut); **↑H** (haut rehaussé); **↓H** (haut rabaissé). Les traits d'union indiquent des limites de morphèmes (mots) au sein de l'énoncé associatif N1N2.

(13) Les alternances dans l'énoncé associatif ayant la structure CV(C)-CV(C)

N1/N2	B	H	B _{↑H}	H _{↓B}
B	B-HB	B-H	B-H	B-B
H	H-↑HB	H-↑H	H-↑H	H-B
B _{↑H}	H-↑HB	H-↑H	H-↑H	H-B
H _{↓B}	H-↓HB	H-↓H	H-↓H	H-B

On remarquera que, basé sur l'énoncé associatif, on n'aurait pas besoin de distinguer entre les catégories **H** et **B_{↑H}**, les deux ayant des alternances identiques. La nécessité de maintenir la distinction entre les deux schémas est cependant révélée dans d'autres constructions associatives où le premier constituant (N1) est au pluriel. Le tableau (14) montre les réalisations du schéma **B_{↑H}** en comparaison avec les schémas **H** et **B** dans l'énoncé associatif du type *bè-N1 bē H N2* (pl du sg). Cette construction est caractérisée par (a) un marqueur lié de classe à ton bas *bè-* ou *mè-*, et (b) un marqueur libre de concorde à ton haut *bé* ou *mé* suivi par le marqueur associatif **H**.

- (14) Réalisations phonétiques des schémas B, H et BH dans le contexte ‘pl du sg’

N1/N2	B	H	BH
B	B-B-H-↑HB	B-B-H-↑H	B-B-H-↑H
H	B-H-↑H-HB	B-H-↑H-↑H	B-H-↑H-↑H
BH	B-B-H-↑HB	B-B-H-↑H	B-B-H-↑H

On remarquera que dans cette construction le schéma BH est réalisé en position initiale (N1) comme le schéma B, à savoir bas. En position finale (N2) par contre, le schéma BH est réalisé comme le schéma H, à savoir ↑H.

Les tableaux (15–17) ci-dessous présentent les alternances dans l’énoncé associatif dont l’un (15, 16) ou même les deux constituants nominaux (17) ont la structure syllabique CVCV.

- (15) Les alternances dans l’énoncé associatif ayant la structure CV(C)-CVCV

N1/N2	BB	HH	BH	HB	BBB	BHB
B	B-HB	B-H' H	B-H' H	B-HB	H-BB	B-HB
H	H-↑HB	H-↑HH	H-↑HH	H-↑HB	H-BB	H-↑HB
BH	H-↑HB	H-↑HH	H-↑HH	H-↑HB	H-BB	H-↑HB
HB	H-↑HB	H-↑HH	H-↑HH	H-HB	H-BB	H-↑HB

Dans le tableau (16) ci-après on remarquera deux alternances du schéma de base HB, à savoir (a) représentant des noms ayant la forme syllabique CV (par ex. mbò ‘souris’) et (b) représentant des noms ayant la forme syllabique CVS (par ex. mbàm ‘homme’) (cf. §1).

- (16) Les alternances dans l’énoncé associatif ayant la structure syllabique CVCV-CV(C)

N1/N2	B	H	BH	HB	
				(a)	(b)
BB	BB-HB	BB-H	BB-H	BB-B	BB-HB
HH	HH-↑HB	HH-↑H	HH-↑H	HH-B	HH-↑HB
BH	BB-HB	BB-H	BB-H	BB-B	BB-HB
HB	HB-HB	HB- 'H	HB- 'H	HB-B	HB-HB
BBB	BB-HB	BB-H	BB-H	BB-B	BB-HB
BHB	H' H-HB	H' H-↑H	H' H-↑H	H' H-B	H' H-↑HB

Le tableau (17) présente les alternances de l’énoncé associatif constitué de noms dissyllabiques (CVCV).

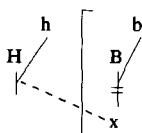
(17) Les alternances dans l'énoncé associatif ayant la structure syllabique CVCV-CVCV

N1/N2	BB	HH	BH	HB	BBB	HBH
BB	BB-HB	BB-H'H	BB-H'H	BB-HB	BH-BB	BB-HB
HH	HH-↑HB	HH-↑HH	HH-↑HH	HH-↑HB	HH-BB	HH-↑HB
BH	BB-HB	BB-H'H	BB-H'H	BB-HB	BH-BB	BB-HB
HB	HB-↑HB	HB-↑H'H	HB-↑H'H	HB-↑HB	HB-BB	HB-↑HB
BBB	BB-HB	BB-H'H	BB-H'H	BB-HB	BH-BB	BB-HB
HBH	H'H-↑HB	H'H-↑HH	H'H-↑HH	H'H-↑HB	H'H-BB	H'H-↑HB

Après avoir dégagé les alternances tonales, nous passerons maintenant à la description de celles-ci à l'aide de règles de réalisation. De chaque forme de base sera d'abord étudiée la réalisation en position initiale (N1) puis la réalisation en position finale (N2). Nous commencerons par l'étude des radicaux monosyllabiques et ferons suivre l'étude des radicaux dissyllabiques.

Les alternances du schéma tonal B. En position initiale, le ton de base b est réalisé bas. En fin d'énoncé par contre, la réalisation du ton bas doit être expliquée en fonction du ton précédent, à savoir le ton haut flottant marqueur de l'énoncé associatif. Nous proposons la règle de réalisation (18).

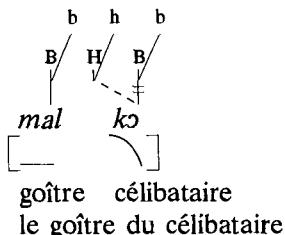
(18) Règle de propagation d'un ton haut flottant vers la droite



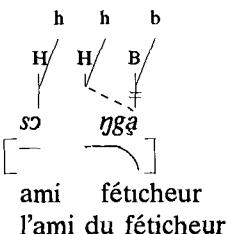
C'est une règle post-lexicale, c'est-à-dire qu'elle s'applique à travers les limites de morphèmes. Selon cette règle, un ton haut flottant se propage vers la droite et remplace le ton bas suivant.

A la règle (18) est associée la condition selon laquelle le ton bas n'est pas dissocié en fin d'énoncé. Les exemples suivants illustrent l'application de la règle (18).

(19)

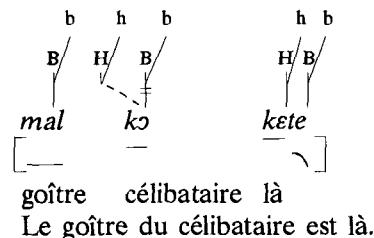


(20)

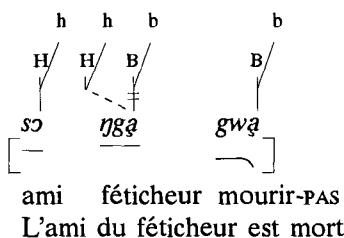


Les exemples suivants illustrent des cas où la condition mentionnée ci-dessus n'entre pas en vigueur.

(21)



(22)

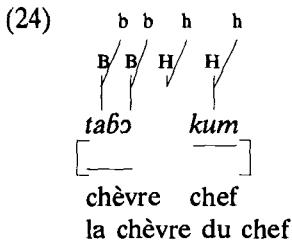
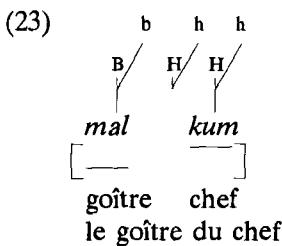


On remarquera que le ton **h** des morphèmes *ŋga* (20) et *kete* (21) est réalisé plus haut que le ton **h** du morphème précédent. Ce phénomène nous amène à postuler ce qui suit. Nous avons observé qu'en *kakɔ* le principe obligatoire de contours (POC) ('Obligatory Contour Principle' (OCP) en anglais) s'applique à l'intérieur de l'unité lexicale (morphème), mais ne s'applique pas à travers des limites de morphèmes. Ainsi, des unités lexicales ayant la forme de base **HH** comme par ex. *sósó* 'canard' seront

réalisées HH, tandis que des constructions associatives constituées uniquement de tons hauts, comme par ex. *sósó kúm* ‘le canard du chef’ (HH-H-H) sont réalisées HH-H, le ton H étant réalisé plus haut que le ton haut précédent. Selon la théorie ‘Register Tier,’ un registre ‘h’ suivant un autre registre ‘h’ est plus haut que celui-ci. Il en résulte que deux tons hauts consécutifs représentés H-H au niveau modal sont réalisés différemment, le deuxième étant plus haut que le premier.

Les alternances du schéma H. En position initiale, le ton de base H est réalisé haut (H). En position finale en revanche, nous distinguons entre alternances étant toutes des modifications du ton haut, à savoir (a) haut (H), (b) haut rabaisé (H) et (c) haut rehaussé (H). En plus, on notera qu’un ton de base H est réalisé haut rehaussé après un ton haut rehaussé. Ce ton, ayant subi deux fois un rehaussement par rapport au ton simplement haut (H), peut être expliqué par la non application du principe POC d’une part et l’application d’un des principes de la théorie ‘Register Tier’ d’autre part. Selon ce principe le second de deux registres (h-h) consécutifs est plus haut que le premier. Comme il s’agit de l’application d’un seul et même principe, nous proposons de désigner tous les tons hauts rehaussés par l’abréviation H. En conclusion, nous distinguons donc, pour le ton de base H, quatre niveaux tonétiques, à savoir H, H, H1 et H2. Nous faisons suivre, ci-après, une discussion de ces alternances.

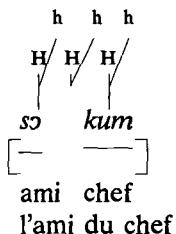
Le ton de base H est réalisé haut (H) après un ton haut flottant.



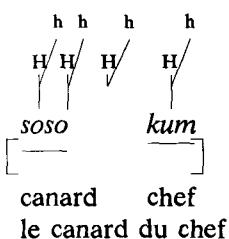
Le ton de base H est réalisé haut rehaussé (H) après un ton haut. Le rehaussement du ton haut est dû à la non application du principe POC à

travers des limites de morphèmes. Nous rappelons que, selon la théorie 'Register Tier,' le second de deux registres hauts (h-h) consécutifs est plus haut que le précédent.

(25)



(26)



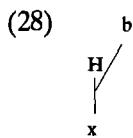
L'alternance 'h' représente un phénomène phonétique très courant dans les langues tonales connu sous le nom de DOWNDRAFT. Nous proposons la règle suivante pour expliquer le phénomène du downdrift.

(27) Règle de rabaissement (downdrift)

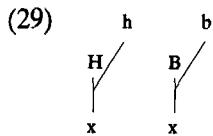


La règle de rabaissement décrit le fait que des tons associés causent l'abaissement des tons hauts suivants. On remarquera dans les exemples ci-dessous que la règle (27) n'est appliquée qu'après que le principe ROC ait été appliqué. Selon ce principe, le ton haut flottant (H°), constituant le marqueur associatif, s'unit avec le ton haut (H) suivant du radical nominal. On notera que ce processus se déroule à travers des limites de morphèmes mais à l'intérieur du mot dont fait part, historiquement parlé, le marqueur associatif.

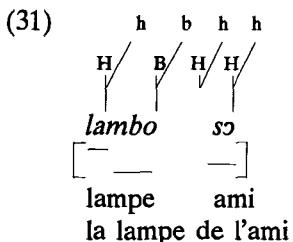
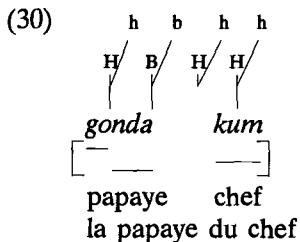
Ayant dit que ces deux processus sont ordonnés, on comprendra que les lignes associatives dans les exemples ci-dessous ne se croisent pas comme la présentation graphique pourrait faire croire. Le ton haut rabaissé résultant du processus de rabaissement d'un ton haut est représenté schématiquement comme suit.



Ce schéma se lit: un ton haut (H) au niveau de registre inférieur (b) est réalisé entre les deux extrêmes schématisés ci-après.

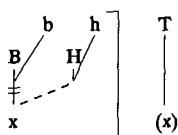


Le phénomène du rabaissement tonal est illustré par les exemples suivants.



Les alternances du schéma tonal BH. Le ton de base BH est réalisé haut (H) en position initiale. Cette réalisation est expliquée par la règle de réalisation (32).

(32) Règle de propagation d'un ton haut flottant vers la gauche



La règle (32) ci-dessus est une règle post-lexicale. Elle s'applique à l'intérieur du mot bien que les conditions structurelles de la règle incluent le contexte immédiat du morphème suivant celui subissant la modification tonale.

Selon la règle (32), précédant un ton associé ou non associé, un ton haut flottant se propage vers la gauche et remplace un ton bas associé. Les exemples suivants servent à illustrer cette règle.

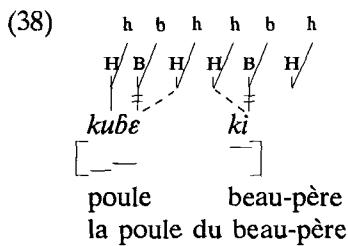
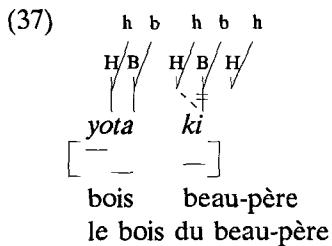
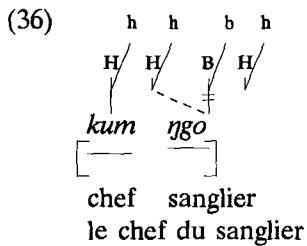
(33)	b h h h
	B / H / H / H /
	+
	kol kum
	[— —]
	pied chef
	le pied du chef

(34)	b h h b h
	B / H / H / B / H /
	+
	ki ngo
	[— —]
	beau-père sanglier
	le beau-père du sanglier

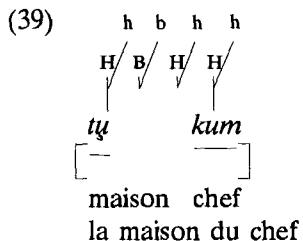
Nous rappelons la réalisation d'un ton haut (*kum/ngo*) suivant un ton haut due à la non application du principe POC à travers des limites de morphèmes.

En position finale, les alternances du ton BH sont identiques à celles du ton H . Cette réalisation résulte de l'application de la règle (18) selon laquelle un ton haut flottant se propage vers la droite et remplace le ton bas suivant. Nous présenterons ci-après un exemple illustrant chacune des alternances H , tH , et H' . Les exemples seront présentés dans ce même ordre.

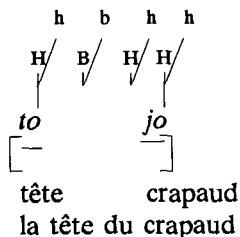
(35)	b h b h
	B / H / B / H /
	+
	kon ngo
	[— —]
	ver sanglier
	le ver parasitaire du sanglier



Les alternances du schéma HB. En position initiale, la réalisation du ton HB est identique à celle du ton H, à savoir haut (H). Les exemples suivants servent à illustrer ce fait.

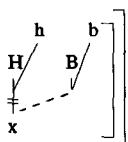


(40)



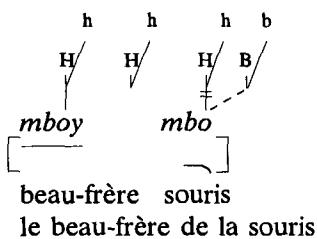
En position finale, la réalisation du ton HB peut être expliquée à l'aide de la règle de réalisation (41).

(41) Règle de propagation d'un ton bas vers la gauche

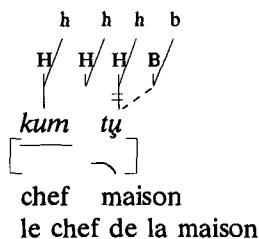


Il s'agit ici d'une règle post-lexicale selon laquelle, en fin d'énoncé, un ton bas flottant se propage vers la gauche et remplace le ton haut précédent. Les exemples ci-dessous illustrent cette propagation tonale.

(42)



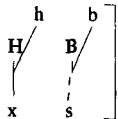
(43)



Il est à noter que la règle (41) n'est applicable qu'aux noms dont la structure syllabique est cv. Il existe pourtant des noms du type cvc ayant la même forme tonale de base HB. Ces noms suivent la règle de réalisation expliquée ci-dessous; nous l'appelons 'règle d'amarrage' ('docking' en anglais)

d'un ton bas. La lettre *s* dans le schéma ci-dessus représente une consonne sonante.

(44) Règle d'amarrage d'un ton bas



Cette règle est aussi post-lexicale. Elle s'applique exclusivement aux noms du type cvc. Nous rappelons que la consonne finale est une sonante, soit *m*, *n*, *ŋ*, *l*, *y*, ou *w*, et peut, en tant que telle, porter un ton. Selon la règle (44), un ton bas flottant en position finale d'énoncé s'amarre à la consonne sonante. Les exemples suivants servent à illustrer ce phénomène.

(45)	<i>kwe</i>	b h	<i>mbam</i>	h b
	[—]	B / H /	[—]	H / B /
	antilope			homme
	l'antilope de l'homme			

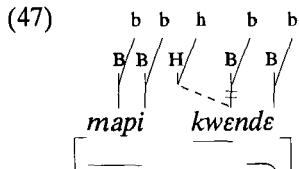
(46)	<i>pa</i>	h h	<i>sinj</i>	h b
	[—]	H / H /	[—]	H / B /
	tique			chat
	le tique du chat			

Nous étudierons maintenant les schémas relatifs à des radicaux nominaux dissyllabiques. Nous rappelons que nous en avons établi six, à savoir BB, HH, BH, HB, BBB et HBH. Nous les présenterons un à un dans ce même ordre.

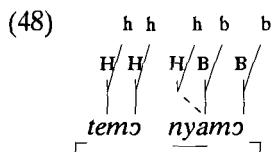
Les alternances du schéma tonal BB. En position initial, la séquence tonale de base BB est réalisée bas-bas comme on devrait s'y attendre. C'est ici la seule réalisation du schéma BB dans cette position.

En position finale, par contre, on distinguera entre trois alternances, à savoir HB, 1HB, et 'HB. On notera que les alternances ne regardent que le ton *h*. Ces alternances ont déjà été décrites plus haut. Les exemples

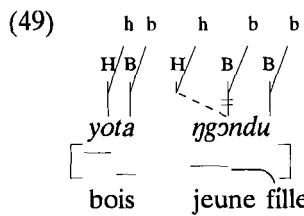
suivants les présentent dans l'ordre ci-dessus. Ces alternances résultent de l'application de la règle (18) selon laquelle un ton haut flottant se propage vers la droite et remplace le ton bas suivant.



bagage banane
le bagage de la banane plantain

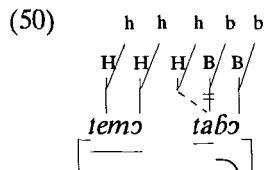


coeur animal
le cœur de l'animal

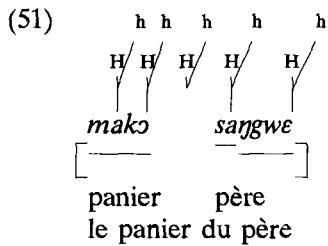


bois jeune fille
le bois de la jeune fille

Les alternances du schéma HH. En position initiale, la séquence de deux tons de base hauts HH est réalisée haut-haut.

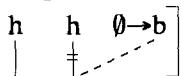


coeur chèvre
le cœur de la chèvre

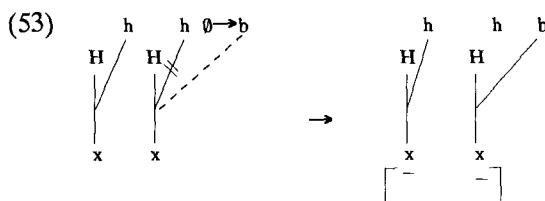


En position finale comme le montre l'exemple (51), le schéma tonal HH est réalisé haut-haut rabaissé. Ce phénomène étrange a été observé en fin d'énoncé aussi qu'à travers des limites de morphèmes. Nous l'expliquerons à l'aide de la règle de réalisation (52).

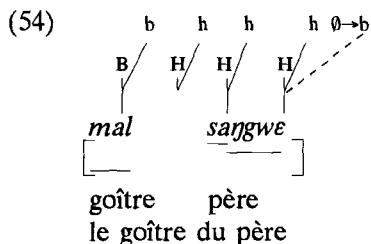
(52) Règle d'insertion de registre bas

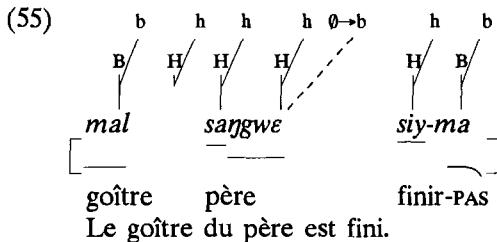


Selon la règle (52), un registre bas (b) est inséré dans une séquence de deux tons be base hauts (HH) dissociant le registre haut (h) de la seconde unité porteuse d'un ton (UPT). Ce processus peu commun, qui mérite d'être débattu, peut être schématisé comme suit.

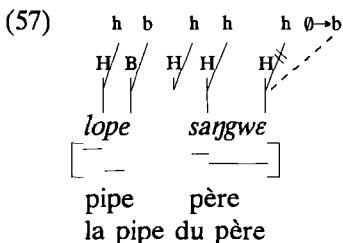
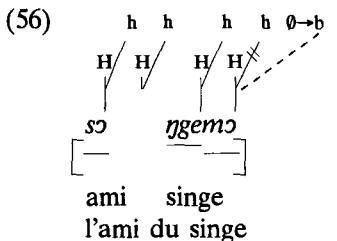


Les exemples suivants illustrent le phénomène d'insertion de registre dans les deux contextes mentionnés ci-dessus, à savoir (a) en fin d'énoncé (54) et (b) à travers des limites de morphèmes (55).





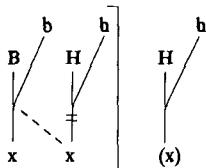
Il est à noter que la règle (53) s'appliquera aussi dans le cas où le ton précédent le ton haut qui subit un rabaissement de registre, a lui-même subi une modification tonale. Dans les deux exemples suivants, la réalisation du premier ton haut de la séquence de base HH est réalisée IH et ' H ' respectivement. Le second ton haut subira un rabaissement de registre et sera réalisé H (56) et ' H ' (57) respectivement.



Nous rappelons le phénomène de downdrift que nous avons décrit plus haut selon lequel un ton haut est rabaissé après un ton bas; cela est illustré par *sangwe* (57).

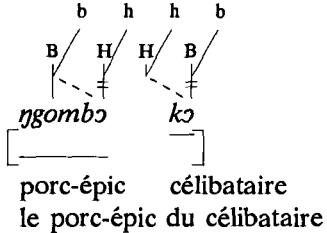
Les alternances du schéma BH. En position initiale, le schéma BH est réalisé bas-bas. La règle de réalisation suivante a été établie pour tenir compte de ce phénomène de propagation d'un ton bas.

(58) Règle de propagation d'un ton bas vers la droite.



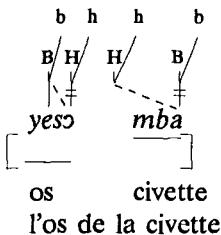
Selon la règle de réalisation (58), un ton bas est propagé vers la droite dissociant un ton haut qui précède un ton haut soit associé, soit non associé. Les exemples suivants servent à illustrer cette propagation d'un ton bas.

(59)



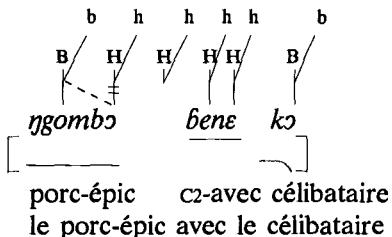
porc-épic célibataire
le porc-épic du célibataire

(60)



os civette
l'os de la civette

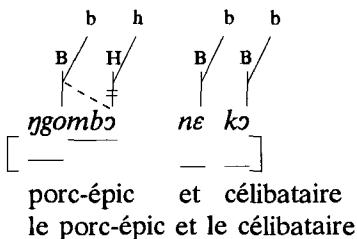
(61)



porc-épic c2-avec célibataire
le porc-épic avec le célibataire

Le schéma BH serait réalisé bas-haut s'il était suivi par un ton bas.

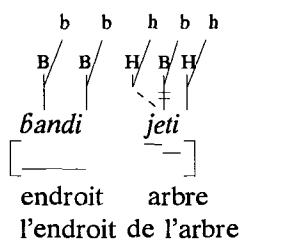
(62)



porc-épic et célibataire
le porc-épic et le célibataire

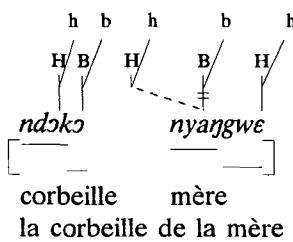
En position finale, les réalisations du schéma BH sont identiques à celles du schéma HH. Ces alternances sont dues à l'application de la règle de propagation d'un ton haut flottant (18) selon laquelle le ton haut flottant marquant l'énoncé associatif se propage vers la droite et remplace le ton bas. Nous présenterons ci-après des exemples illustrant respectivement les alternances H'H et 'H'H du schéma BH. Comparons-les avec les exemples (56) et (57) respectivement.

(63)



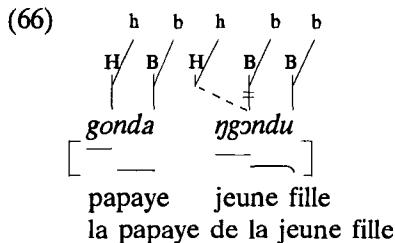
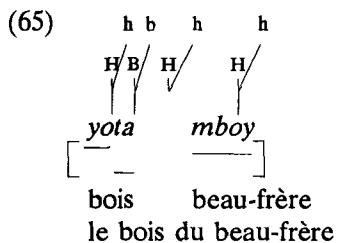
endroit arbre
l'endroit de l'arbre

(64)

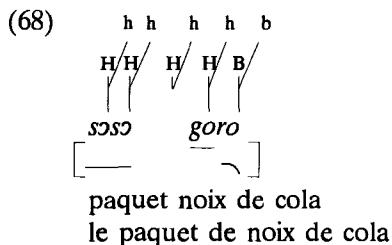
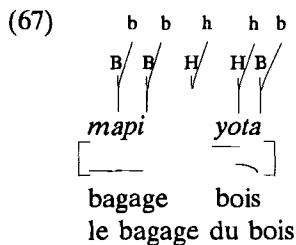


corbeille mère
la corbeille de la mère

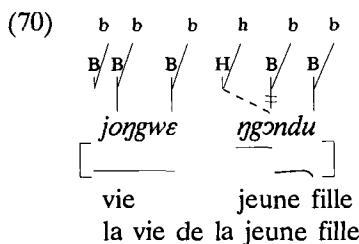
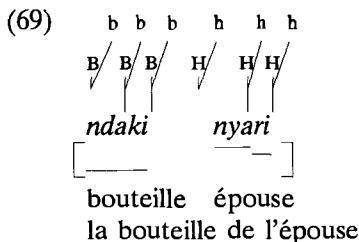
Les alternances du schéma HB. En position initiale, le schéma HB est réalisé haut-bas.



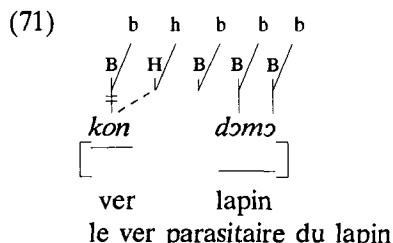
En position finale, les réalisations du schéma HB sont identiques à celles du schéma BB. On se rappellera que le premier ton haut de la séquence tonale BB est réalisé haut après application de la règle de propagation d'un ton haut flottant (18) selon laquelle le ton haut flottant marquant l'énoncé associatif se propage vers la droite et remplace le ton bas adjacent. Il en résulte la réalisation HB. Nous nous contenterons donc, pour illustrer les alternances du schéma HB, de donner les exemples (67) et (68) ci-dessous.



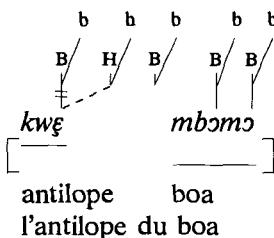
Les alternances du schéma $\ddot{B}BB$. En position initiale, la réalisation du schéma $\ddot{B}BB$ est identique à celle du schéma BB , à savoir bas-bas comme l'illustrent les exemples (69) et (70).



En position finale, le schéma $\ddot{B}BB$ est réalisé bas-bas-descendant. En comparant les deux schémas $\ddot{B}BB$ et BB on constatera que, dans le cas de BB , le ton haut flottant du marqueur associatif se propage vers la droite et dissocie le premier des deux tons bas produisant ainsi la réalisation HB . Dans les cas de $\ddot{B}BB$, ce même ton haut flottant, suivant la règle de propagation d'un ton haut flottant (32) se propage vers la gauche et dissocie tout ton bas en position initiale. Ce phénomène est dû au fait que, dans le cas du schéma $\ddot{B}BB$, le ton bas flottant \ddot{B} empêche le ton haut flottant \ddot{H} , marqueur de l'énoncé associatif, de se propager vers la droite; il se propage donc vers la gauche. On notera aussi que selon la théorie 'Register Tier,' le schéma $\ddot{B}BB$ est réalisé plus bas que le ton bas précédent (73) et (74). Les exemples suivants illustrent la représentation du schéma $\ddot{B}BB$ en position finale.

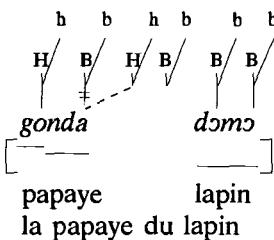


(72)

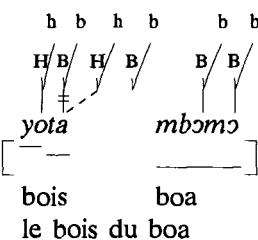


Comme nous l'avons mentionné plus haut, le schéma BBB est réalisé extra bas s'il suit un ton bas. De cette alternance tient compte la théorie 'Register Tier,' selon laquelle un registre bas (b) est réalisé plus bas que le registre bas précédent (b).

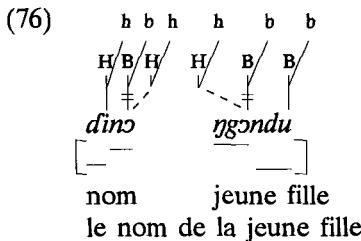
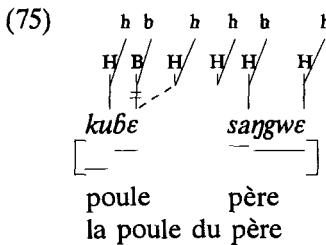
(73)



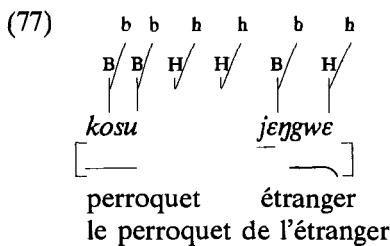
(74)



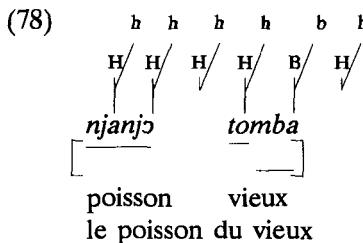
Les alternances du schéma HBH. En position initiale, le schéma tonal HBH est réalisé haut-haut rehaussé. Ce phénomène peut être expliqué, tout d'abord, par l'application de la règle de propagation d'un ton haut vers la gauche (32), selon laquelle un ton haut se propage vers la gauche et dissocie le ton bas. On remarquera que, pour une raison que nous ne pouvons pas expliquer, le principe POC ne s'applique pas dans ce cas particulier, ledit ton haut étant réalisé plus haut que le ton haut précédent.



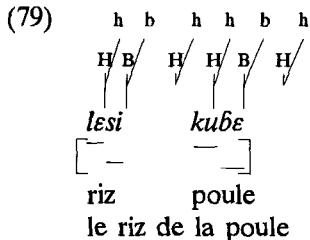
En position finale, le schéma HBH est réalisé comme les schémas HB et BB. Nous rappelons que dans ces cas les réalisations du ton H sont identiques aux réalisations du premier ton haut du schéma HH. Les exemples (77)–(80) illustrent les alternances du schéma HBH, à savoir HB, tHB et 'HB. Les exemples ci-dessous seront présentés dans cet ordre.



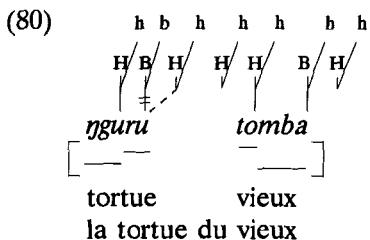
Comme le ton haut flottant du marqueur associatif n'a pas d'influence modifiant sur un ton haut associé, aucun changement tonal n'intervient au niveau du nom en question (*jèngwè*) dans l'exemple (77) ci-dessus.



On notera que le ton haut associé du nom *tómbà* est réalisé plus haut que le ton haut associé qui le précède. Nous rappelons que le principe POC ne s'applique pas à travers des limites de morphèmes. Selon la théorie 'Register Tier,' deux registres hauts (h) adjacents sont réalisés de façon différente, c'est-à-dire, le second est plus haut que le premier.



L'exemple ci-dessus présente un cas de downdrift. Selon cette règle le ton bas du mot *lesi* cause l'abaissement du ton haut associé qui suit.



L'exemple ci-dessus est composé de deux noms ayant la forme de base HBH. Quant à la réalisation de HBH en position initiale, nous l'avons décrite au début de notre section. Quant à la réalisation de HBH en position finale, nous voyons de nouveau en vigueur les principes relatifs aux registres hauts adjacents décrits dans la théorie 'Register Tier.'

4. Conclusion

L'emploi du modèle 'Register Tier' développé par Snider (1988) nous a permis de décrire toutes les réalisations tonétiques attestées dans l'énoncé associatif à l'aide de deux paires de traits distinctifs situés sur deux niveaux autosegmentaux, à savoir H et B (niveau modal) d'une part et h et b (niveau de registres) d'autre part. Notamment les réalisations tonétiques situées entre les deux extrêmes haut et bas, à savoir les tons dits 'moyens' ont pu être expliqués par lesdits traits. Nous avons ainsi pu établir, pour le *kako*, un système à deux tons de base: H et B dont les réalisations

peuvent être expliquées par des règles conformes au modèle mentionné. Ce sont pour la plupart des règles de propagation qui concernent surtout le ton haut flottant du marqueur associatif.

Cette étude a aussi démontré qu'il existe plus de variantes tonétiques du ton haut qu'il en existe du ton bas. Ce phénomène, pourrait-il être une indication en faveur d'une orthographe qui note le ton bas plutôt que le ton haut? Il est espéré qu'une future étude approfondie à ce sujet puisse répondre à cette question.

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Floating High Tones in Nōmaándé Locatives

Patricia Wilkendorf

Abstract

The locative construction in Nōmaándé is made up of a locative morpheme which consists of a vowel with an underlying low tone followed by a floating high tone, followed in turn by either a noun phrase or a verbal infinitive. Five tone rules, discussed in this paper, are needed to account for the surface forms generated. Rule derivations are shown for certain examples of the locative followed by a noun.

Résumé

Le syntagme locatif en nōmaándé comprend aussi bien un morphème locatif qu'un syntagme nominal ou un infinitif suivant. Le morphème locatif consiste en un élément vocalique avec un ton lexical bas, suivi d'un ton flottant haut. Les cinq règles tonales présentées ici se montreront nécessaires pour arriver aux formes du syntagme locatif que l'on trouve dans l'énoncé en nōmaándé. Les dérivations des règles sont données pour certains exemples du locatif suivi d'un nom.

The purpose of this paper¹ is to describe the Nōmaándé locative construction and the tone rules which operate within it.

The basic tonal system in Nōmaándé, a Bantu language of Central Cameroon classified as A.46 by Guthrie (1971:32) and as No. 512 by ALCAM (Dieu and Renaud 1983:53), consists of two underlying tones, high (H) and low (L).² The canonical shape of Nōmaándé noun stems is disyllabic³ of two major types—vcv and cvcv. Each noun stem, then, has an underlying tonal pattern of either H, L, HL, or LH. In addition, each stem has a noun class prefix that bears an underlying L. These noun prefixes are also of two types—v and cv. Taken together, the tonal patterns and the syllable patterns result in the following sixteen canonical noun shapes.

(1) Tone combinations of bisyllabic nouns

H	C <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	C <small>˘</small> V-VC <small>˘</small>
	VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	V-VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>
L	C <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	C <small>˘</small> V-VC <small>˘</small>
	VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	V-VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>
HL	C <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	C <small>˘</small> V-VC <small>˘</small>
	VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	V-VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>
LH	C <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	C <small>˘</small> V-VC <small>˘</small>
	VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>	V-VC <small>˘</small> V-C <small>˘</small> VC <small>˘</small>

The locative morpheme which precedes a noun consists of a vowel, the phonetic form of which is dependent upon vowel harmony processes. If the

¹The research for this paper was carried out under the auspices of the Ministry of Higher Education, Computer Services and Scientific Research, the Institute of Social Sciences, and the Centre for Anthropological Research and Studies of the Republic of Cameroon. I would like to thank my language assistant on this project, Mr. Emmanuel Atoko from the village of Tchekos, for his invaluable help in collecting and verifying the data for this paper. Many thanks also to my colleague, Keith Snider at the University of Leiden, for his help in my understanding lexical phonology and in the formulation of the tone rules.

²The Nōmaándé language is spoken by a population of 4,000 to 5,000 who are known officially as the Lemande people. They live in the Central Province of Cameroon, Mbam Division, Bokito Subdivision. The Lemande live in seven villages as well as in the town of Bokito and their various dialects are mutually intelligible.

³There are no clear cases of simple cv noun stems, while there are numerous examples of noun stems in the lexicon with more than two syllables. Since many of those examples involve reduplication and possibly nominal suffixes which have yet to be studied, the present paper is limited to applying these tone rules on disyllabic noun stems and verbal infinitives.

noun prefix has a v pattern, the locative morpheme assimilates completely to it. If the noun prefix is cv, the locative morpheme assimilates only the advanced tongue root (ATR) feature. It is realized as *a* for consonant-initial nouns with minus ATR vowels *a*, *ɔ*, or *ɛ*; and as *e* for nouns with plus ATR vowels *i*, *e*, *u*, or *o*.⁴ On the tonal tier,⁵ there is an underlying L associated with this locative vowel, followed by a floating H (H̄), as indicated in (2).

(2) Locative morpheme



1. Locative constructions

The locative morpheme in Nōmaándé can be followed by either a noun phrase or a verbal infinitive. These two subcategories are discussed in §1.1 and §1.2, respectively.

1.1. Locative plus noun. In (3), locative phrases are shown with the sixteen canonical shapes in their underlying form and in their surface realizations. In the third column, an example of each pattern is given.

In §2, five tone rules are posited to explain the data of (3). The H̄-association and downdrift rules apply to all of the forms; the H-backspread rule applies to examples o and p; L-spread applies to examples b and f; and v-lengthening applies to example k.

⁴For a more complete description of the process of vowel harmony in Nōmaándé, see Scruggs 1983:33–35.

⁵The tonal theory used in this paper is that of Lexical Phonology. See Pulleyblank 1986.

(3) Tone patterns in the locative plus noun construction

- a. $\hat{V} \text{ C}\acute{V}\text{-CVC}\acute{V} \rightarrow \hat{V} \text{ C}\acute{V}\text{-!CVC}\acute{V} \text{ à nyé!ndányé}$ 'on the rock'
- b. $\hat{V} \text{ V-CVC}\acute{V} \rightarrow \hat{V} \text{ V-CVC}\acute{V} \text{ i ihé!nyí}$ 'on the roads'
- c. $\hat{V} \text{ C}\acute{V}\text{-VC}\acute{V} \rightarrow \hat{V} \text{ C}\acute{V}\text{-!VC}\acute{V} \text{ à bú!šyó}$ 'in the honey'
- d. $\hat{V} \text{ V-VC}\acute{V} \rightarrow \hat{V} \text{ V-!VC}\acute{V} \text{ è élété}$ 'in the mouths'
- e. $\hat{V} \text{ C}\acute{V}\text{-CVC}\acute{V} \rightarrow \hat{V} \text{ C}\acute{V}\text{-CVC}\acute{V} \text{ à nákónđò}$ 'on the mountain'
- f. $\hat{V} \text{ V-CVC}\acute{V} \rightarrow \hat{V} \text{ V-CVC}\acute{V} \text{ õ óbóbjó}$ 'on the trail'
- g. $\hat{V} \text{ C}\acute{V}\text{-VC}\acute{V} \rightarrow \hat{V} \text{ C}\acute{V}\text{-VC}\acute{V} \text{ à báàc̄j}$ 'on the people'
- h. $\hat{V} \text{ V-VC}\acute{V} \rightarrow \hat{V} \text{ V-VC}\acute{V} \text{ à ááñá}$ 'in the nests'
- i. $\hat{V} \text{ C}\acute{V}\text{-CVC}\acute{V} \rightarrow \hat{V} \text{ C}\acute{V}\text{-!CVC}\acute{V} \text{ à nyí!námbá}$ 'in the kitchen'
- j. $\hat{V} \text{ V-CVC}\acute{V} \rightarrow \hat{V} \text{ V-!CVC}\acute{V} \text{ è élñéndù}$ 'on the knees'
- k. $\hat{V} \text{ C}\acute{V}\text{-VC}\acute{V} \rightarrow \hat{V}\hat{V} \text{ C}\acute{V}\text{-!VC}\acute{V} \text{ éé nú!úci}$ 'in the river'
- l. $\hat{V} \text{ V-VC}\acute{V} \rightarrow \hat{V} \text{ V-!VC}\acute{V} \text{ è élésé}$ 'in the eyes'
- m. $\hat{V} \text{ C}\acute{V}\text{-CVC}\acute{V} \rightarrow \hat{V} \text{ C}\acute{V}\text{-CVC}\acute{V} \text{ à nökéndá}$ 'on the side'
- n. $\hat{V} \text{ V-CVC}\acute{V} \rightarrow \hat{V} \text{ V-CVC}\acute{V} \text{ õ ókòló}$ 'on the foot'
- o. $\hat{V} \text{ C}\acute{V}\text{-VC}\acute{V} \rightarrow \hat{V} \text{ C}\acute{V}\text{-!VC}\acute{V} \text{ è bú!útu}$ 'in the night'
- p. $\hat{V} \text{ V-VC}\acute{V} \rightarrow \hat{V} \text{ V-!VC}\acute{V}^6 \text{ ò ó!ótú}$ 'in the ear'

1.2. Locative plus infinitive. The rules posited in §2 also account for the locative plus infinitive construction used extensively with imperfective-progressive forms in Nōmaándé. Verb stems primarily belong to either a L or HL tonal class and have a v prefix. The verb stem itself has a CVCV syllable structure. The locative phrase is illustrated with these two canonical infinitival forms in (4).

(4) Tone patterns in the locative plus infinitive construction

- a. $\hat{V} \text{ V-CVC}\acute{V} \rightarrow \hat{V} \text{ V-CVC}\acute{V} \text{ õ ó-fáná} \quad \text{('at reading')} \quad (=f)$
- b. $\hat{V} \text{ V-CVC}\acute{V} \rightarrow \hat{V} \text{ V-!CVC}\acute{V} \text{ ò ó-!búmè} \quad \text{('at hunting')} \quad (=j)$

2. Tone rules

In the lexical phonology of Pulleyblank 1986, postlexical rules apply simultaneously whenever possible, but the output of one rule may feed another rule. If two rules may apply to the same underlying form, the more

⁶There are only five verifiable words present in the data with a canonical shape of V-VCV. Of those five lexical items, three follow the tone rules stated in this paper for the locative construction. The other two examples have a derived form of V-V-VCV rather than *V-V-VCV which the tone rules would have incorrectly predicted.

specific rule applies first according to Kiparsky's ELSEWHERE CONDITION (Pulleyblank 1986:93). Although the postlexical tone rules needed for Nômaándé locatives are numbered below, they are not ordered rules.

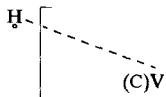
In order to generate correct surface forms of locative phrases, the OBLIGATORY CONTOUR PRINCIPLE (OCP) (Pulleyblank 1986:213) and five postlexical tone rules are required. These rules must be applied postlexically because they are all triggered by the floating H of the locative marker and, therefore, operate across word boundaries. Application of the OCP results in the coalescence of like tones; it applies whenever its structural description is met.

(5) Obligatory contour principle (OCP)

$$\alpha T \quad \alpha T \rightarrow \alpha T$$

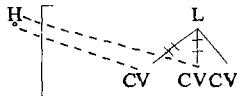
2.1. H-association. The first postlexical tone rule in Nômaándé may be stated as follows: the floating H of the locative morpheme always associates rightward and dissociates a L tone from the vowel it is associated with. In all but two cases, this rightward association occurs on the noun prefix as shown in (6).

(6) Rule 1 H-association



The two exceptions involve nouns with a v prefix and either a cvcv or a cvcv stem (§2.4). If the stem has the canonical shape cvcv (or cvccv) and the noun prefix is cv, the H associates with all but the last vowel.

(7) Further H-association



Thus, the H must associate with a noun prefix of cv or v but goes no further unless the environment stated above is met. For example, in (8), the floating H of the locative associates only with the noun prefix *nɔ* but not with the noun stem *kèndá* since it is a cvccv (LH) pattern. In (9), where the noun stem *kɔndɔ* is cvccv (L), the H associates with both the noun prefix *nɔ* and with the first syllable of the noun stem.

- (8) *nò-kèndá* → à *nó-kèndá* (=m)
 c11-side LOC c11-side
 on the side
- (9) *nò-kòndò* → à *nó-kóndò* (=e)
 c11-mountain LOC c11-mountain
 on the mountain

2.2. Downdrift, downstep. The downdrift rule is a late phonetic realization rule which lowers the entire tone register whenever H follows L.⁷ One way to formalize this process is as in (10), illustrated in (11).

- (10) Rule 2 downdrift

$$H \rightarrow !H/L \underline{\hspace{1cm}}$$

- (11) *ɔ-kòlò* → ɔ *ɔ-kòlò* (=n)
 c3-foot LOC c3-foot
 on the foot

This can be stated in another way as well. In a HLHL sequence, the second L is lower than the first L and the second H is lower than the first H. This is shown in (12).

- (12) Phonetic output of downdrift rule

$$HLHL \rightarrow \begin{bmatrix} - & & & \\ & - & - & \\ & & - & \\ & & & - \end{bmatrix}$$

Downdrift also occurs in Nòmaándé. From the point of view of Pulleyblank's lexical phonology, a nonassociated L affects an immediately following H with the same lowering of the register. The traditional symbol ! is used here in downstep environments, to indicate the presence of a nonassociated L, whereas in downdrift environments the associated L is evident. It is important to note that within lexical phonology, only one late downdrift rule is necessary to account for both downdrift and downstep phenomena, since the rule's structural description is triggered by both

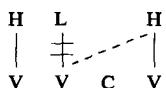
⁷A less standard way of representing downdrift is as follows: L→!L/H\underline{\hspace{1cm}}. In actual fact, the resulting surface structure is the same though the perception of the distance between an underlying H and L is different.

associated and nonassociated L. In (13), the process of downstep is marked by the symbol ! preceding the H syllable.

- (13) *nyí-námbà* → à *nyí-!námbà* (=i)
 c5-kitchen LOC c5-kitchen
 in the kitchen

2.3. H-backspread. In this third postlexical rule, following the association of the H with the v prefix of a noun with the syllable structure V-VCV for LH nouns, the H of the stem spreads backward and dissociates the L from the first stem vowel. This rule is motivated by the undesirability of going down from a H to a L and back up to a downdrifted H, when a downstepped H can indicate the presence of a L. This rule is postlexical because it is triggered by the presence of the H from the locative morpheme.

- (14) Rule 3 H-backspread



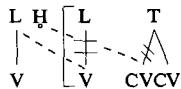
This H-backspread rule applies in the locative phrase, then, only on LH noun stems with a VCV syllable structure, patterns o and p, as shown in (15) and (16).

- (15) *bù-ütú* → è *bú-/ütú* (=o)
 c14-night LOC c14-night
 in the night

- (16) *ò-ótú* → ò *ó-/ótú* (=p)
 c3-ear LOC c3-ear
 in the ear

2.4. L-spread. Rule 4 states that a L spreads rightward from the locative morpheme onto a noun or infinitival prefix which consists of only a vowel, dissociating the tone there. This spreading occurs only when the prefix is followed by a CVCV stem with an underlying L or H pattern. The first syllable of the stem is associated to the H of the locative which dissociates the lexical tone. Rule 4 is presented in (17) and illustrated in (18) and (19). The motivation for this rule has not yet been determined.

(17) Rule 4 L-spread

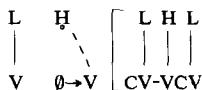


- (18) *i-hényí* → *i* *i-hé!nyí* (=b)
 c4-roads LOC c4-roads
 on the roads
- (19) *ɔ-bɔbɔ* → *ɔ* *ɔ-bɔbɔ* (=f)
 c3-trail LOC c3-trail
 on the trail

With L verbs, the L of the locative morpheme spreads to the infinitival prefix by the L-spread rule so that the H of the locative morpheme must then associate with the first cv of the verb stem as the H-association rule predicts. With HL verbs, the L-spread does not apply so that the H-association rule results in the H associating with the infinitival prefix. The resulting dissociated L causes the immediately following H on the infinitival root to become downstepped.

2.5. v-lengthening. Rule 5 is very specific. It states that the locative vowel lengthens to accommodate the H when the locative precedes a cv-vcv noun where the tone pattern on the noun stem is HL. Thus, the following rule constitutes an addition to the H-association rule (§2.1).

(20) Rule 5 vowel lengthening



The motivation for this rule is not clear since the H of the locative also attaches itself to the following cv in this same environment, as illustrated in (21).

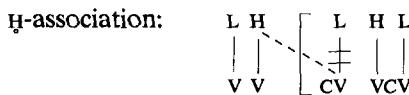
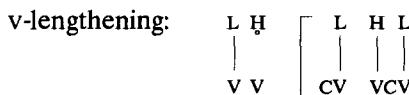
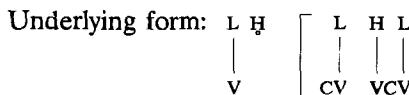
- (21) *nù-úci* → *èé* *nú-!úci* (=k)
 c11-river LOC c11-river
 in the river

While most rule derivations are quite straightforward, three of the locative plus noun phrases which entail the greatest number of rule applications

are given below in order to illustrate rule interaction. As stated above, all postlexical tone rules apply simultaneously whenever possible. For purposes of clarity in this section, however, the rule derivations are shown as if the rules were applied in an ordered manner. Following each derivation, a Nōmaándé example is given with the relative tonal realization marked beside it.

Nouns with a HL pattern on a vcv stem always experience a lengthening of the locative morpheme in the locative phrase. The H of the locative morpheme not only attaches itself to the lengthened vowel, but it also associates with the noun prefix, thus dissociating the lexical L. Finally, downstep occurs due to the Ł which precedes the H on the noun stem. This is illustrated in (22).

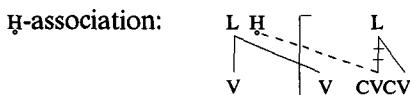
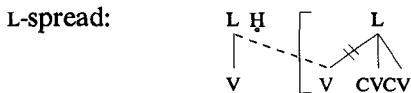
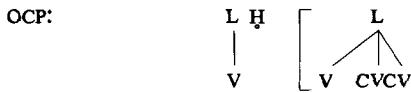
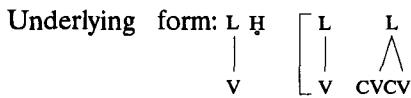
- (22) LOC + cv-vcv (HL noun stem)



éé nū-!úci [- - - -]
in the river

Nouns with L pattern on a cvcv stem undergo L-spreading from the locative morpheme onto the v noun prefix. This forces the H of the locative morpheme to associate with the first syllable of the noun stem. Downdrift occurs automatically with the second L being in a lower register than the initial L. This is illustrated in (23).

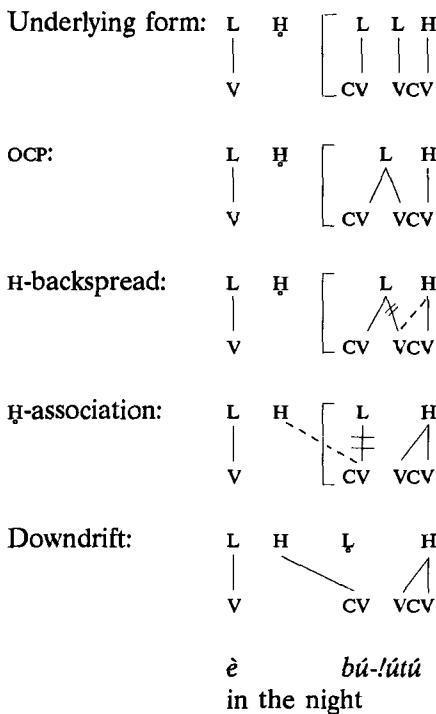
- (23) LOC + v-cvcv (L noun stem)



⌚ ⌚-bóbó [- -]
on the trail

Nouns with a LH pattern on a vcv stem undergo the H-backspread rule which states that the H of the stem associates leftward onto the other syllable of the stem and thus dissociates the lexical L. The H of the locative morpheme associates rightward onto the noun prefix. This causes the resulting dissociated L to become a floating tone. The tonal register is thus lowered. This is illustrated in (24).

- (24) LOC + cv-vcv (LH noun stem)



3. Summary

The locative construction in Nōmaándé consists of a locative morpheme, including a vowel with underlying L followed by a H, followed in turn by either a noun phrase or a verbal infinitive. The tone rules discussed in this paper show how all of the disyllabic surface forms are generated. The most pervasive tone rules posited at this time are the H-association rule, which is applied to all of the examples in this paper, and the downdrift rule (including downstep) which is also characteristic of all the data.

The other three rules have extremely restricted application. The H-backspread rule applies only on LH noun stems with a vcv syllable structure. The L-spread rule applies only on L or H nouns or infinitives with a cvcv syllable structure in the root. And, finally, the vowel lengthening rule applies only when the locative morpheme precedes a cv-vcv noun with a tonal pattern of HL on the noun stem.

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Tone in the Nugunu Verb Phrase

Frankie Patman

Abstract

Nugunu is a Bantu language spoken in the Central Province of Cameroon. As in many tone languages, the phonetic pitch of Nugunu words and phrases makes it difficult to posit their underlying tones. In a number of different environments, high tone spreads to the right, displacing a low tone, and causing following high tones to be downstepped; or the high tone shares the tone-bearing unit occupied by a low tone, resulting in a tone glide. There are three verb classes in the language based on tone patterns for marking tense and mood. Various restrictions of occurrence between governing tonal class markers and segmental aspect markers are described. Some verbs of the vc syllable pattern have irregular tone patterns which vary according to tense or mood inflection. There are also certain discrepancies between the way tones are mapped onto low-tone verb roots and high-tone roots, but these can be accounted for by Pulleyblank's lexical phonology model.

Résumé

Le nugunu est une langue bantu parlée dans la province du Centre au Cameroun. Comme dans beaucoup de langues tonales, il est souvent difficile de déterminer les tons sous-jacents des mots et des syntagmes, en ayant pour point de départ leur réalisation phonétique. Dans un certain nombre de contextes, le ton haut se propage vers la droite, déplaçant un ton bas, créant ainsi une faille tonale des tons hauts suivants. Dans d'autres contextes, le ton haut s'associe à une unité porteuse de ton possédant un ton bas, et il en résulte un ton modulé.

Il existe des classes verbales dans la langue, les verbes se répartissant en trois groupes en fonction du schème tonal marquant le temps et le mode. Diverses restrictions déterminant les occurrences de marqueurs de classe tonals et de marques d'aspect segmentales ont été relevées. Certains verbes de structure syllabique vc possèdent un schème tonal irrégulier qui varie suivant le temps ou le mode employé. Il y a également des divergences entre la façon

dont les tons sont associés à des radicaux verbaux à ton bas et à des radicaux à ton haut; mais on peut en rendre compte en suivant le modèle de phonologie lexicale de Pulleyblank.

Nugunu is a tone language spoken in the Central Province of Cameroon, Mbam Division. It is sometimes referred to as Yambassa, although this name includes several ethnic groups and is not normally used by speakers of Nugunu. Guthrie (1971) has classified Yambassa in the group A.60, Sanaga Group (Cameroon). In the *Atlas Linguistique du Cameroun* (Dieu and Renaud 1983), Nugunu is classified as Benue-Congo, Bantoid, Bantu, Mbam under the number 541. There are about 30,000 speakers.

Nugunu has two phonemic tones, **H** and **L**. These may be realized at any number of phonetic pitch levels because of the process of downdrift, in which the pitch of any **H** following a **L** is lower than the pitch of preceding **H** tones. Rising, falling, and rising-falling contours are also found, formed by the juxtaposition of two or more dissimilar tones.

As in many tone languages, the actual pronunciation of tone on many Nugunu words and phrases is not always immediately apparent from their underlying forms. For example, a level tone may be heard where a rise is expected; tone patterns marking tenses on verbs are not always consistent; and the lexical tone of a few verbs appears to change according to the tense being employed. Differences in underlying and surface forms can usually be explained in terms of the application of various tone rules. This paper attempts to posit those rules which control tonal variation in the Nugunu verb phrase.

1. Verb patterns

1.1. Verb phrases. On the segmental level, a simple Nugunu verb phrase is made up of the following morphemes in the order given—subject marker (which agrees with the noun class of the subject), tense marker (*báà*, *á*, *mbà* for past tenses (PST1, 2, 3 respectively); *gáá*, *ná*, *ŋgá* for future tenses (FUT1, 2, 3 respectively), optional object markers (which agree with the noun class of objects), verb stem, optional suffixes marking aspect, and a final vowel (FV) which may be either *a*, *e*, *o*, or *ɔ*.¹ Typical examples of verb phrases are presented in (1) and (2). Note that present tense has no segmental marker preceding the verb in (2).

¹This final vowel is typical of Bantu verbs and does not appear to have a meaning.

- (1) *À mbà yè gòlò.*²
 he PST3 it take-FV
 He took it.
- (2) *À ñ-ànan-à nkádè?*
 he do-PROG-FV what
 What is he doing?

Tense and mood are also marked by tone on the Nugunu verb. Present tense is marked by L on all tone-bearing units (TBUs) following the verb root, as are tenses marked segmentally by *báà* (PST1) and *ná* (FUT2). Tenses marked by á (PST2), *mbà* (PST3), *gàá* (FUT1) and *ñgà* (FUT3) are signalled by H on all TBUs after the verb stem. The tonal marker posited for imperative is a HL suffix. These tonal morphemes appear on the verb in the following order: (a) the lexical tone of the verb, (b) either the H or L of the tense or infinitive marker, or the H of imperative mood, and (c) the L of the imperative mood. The resulting patterns for H and L verb roots are illustrated in (3)–(5).

- (3) *gò mānà* ‘to finish’
- À mānà. ‘He finishes.’
 À mbà māná. ‘He finished.’
- (4) *gò gólb* ‘to take’
- À gólb. ‘He takes.’
 À gáá gólb. ‘He will take.’
- (5) *gò sisé* ‘to descend’
- À sisé. ‘He descends.’
 Siséé! ‘Descend!’

²In the Nugunu orthography currently in use, only H tone is marked and tone glides are indicated by adding additional vowel symbols. Although this paper keeps to the convention of indicating tone glides by multiple vowel symbols, it marks both H and L tones with accents to add clarity. The tone marking system for this paper is therefore the following: á high tone, à low tone, áà falling tone, àá rising tone, ááà rising-falling tone.

1.2. Verb stems. Verb stems in Nugunu have syllable patterns cv, cvc, cvvc, or vc. One verb has been found with the nasal *ŋ* as stem. With the exception of this L-tone syllabic nasal, any type of verb root, regardless of its cv pattern, may be lexically associated with either a H or L. In (6), the surface phonetic realization is given for the infinitive form of each verb. The final L in each example marks it as an infinitive.

(6) Canonical verb stems

	CV	CVC	CVVC	VC	N
H	fá-a [fáà]	húm-e [húmè]	düün-e [düünè]	áb-a [àbà]	
	to give	to go out	to run	to share	
L	nò-o [nò]	bòl-a [bòlà]	bien-e [biènè]	òy-o [òyò]	ŋ-a [ŋà]
	to throw	to arrive	to follow	to help	to do

Note that the irregular verb *áb* ‘to share’ is posited lexically to have a H which disappears in the infinitive form (see §5 for further discussion). Note also that vowel length is not marked for the infinitive of *nò* ‘to throw’ because identical vowels carrying the same tone coalesce and are realized word finally as a short vowel.

1.3. Tonal variation. The various phonetic realizations of tone observed in Nugunu verb phrases are discussed in this section. Rules to account for these realizations are proposed in §3.

H-L-H tone pattern. The most common discrepancy between surface and underlying forms occurs in sentences with a H-L-H pattern. In this case, L is pronounced as H, and the following H is pronounced as a downstepped H (with downstep marked by the traditional ! before the syllable). This tone change occurs both within the verb and across word boundaries, as shown in (7) and (8).

- (7) Gò á bòlá. → Gò á bò!lá.
you PST2 arrive
You have arrived.

- (8) À gòlò kólb. → À gòlò !kólb.
he take rat
He takes the rat.

H-L-L tone pattern. A second common variation occurs within the verb phrase when an underlying H-L-L pattern is present. The surface form for this pattern is H-F-L, as indicated in (9).

- (9) *Bá bòlà.* → *Bá bóòlà.*
 they arrive
 They arrive.

Rising and falling tones. Rising and falling tones may also be realized differently from what would be expected from the underlying form. Within a verb phrase, a rising tone followed by H may be realized as a level L, as in (10).

- (10) *À gàá húmé.* → *À gà húmé.*
 he FUT1 go^out
 He will go out.

A more complicated process occurs in sequences of rising and falling tones. In (11), a tense marker carrying a rising tone is followed by a verb with a rising-falling tone. The rising-falling sequence is realized as a downstepped H.

- (11) *À gàá nòò.* → *À gàá !nó.*
 he FUT1 throw
 He will throw.

Tone patterns on verb stems. Within the verb itself, there are differences in the patterns of tonal affixes which depend upon the lexical tone of the verb root. For example, consider the verbs *biene* ‘to follow’ and *biene* ‘to give birth’.

(12)	<i>biene</i> ‘to follow’	<i>biene</i> ‘to give birth’
PRES	<i>bìènè</i>	<i>bíènè</i>
FUT1	<i>bìènè</i>	<i>bíènè</i>

Surface present-tense forms of these verbs are *bìènè* and *bíènè*, the second tone-bearing unit in each verb taking L. In the immediate future tense, however, the tone patterns for the two verbs differ. *Biene* becomes *bìènè* while *biene* is pronounced *bíènè*. In this case, the second TBU in the L verb does not take H as does the second TBU in the H verb.

Apparent variation in lexical tone. Apparent variation in the lexical tone of certain verbs has also been observed. For example, the present tense of the verb meaning ‘to fall’ is *òbà*, the immediate future of this same verb is *óbá*. The tones on the verb root and on the final vowel change.

Verbs with final falling tone vs. verbs with level tone. Verbs in Nugunu divide into three groups according to their tonal patterns. Verbs in group 1 are realized with a final falling tone in any verbal construction requiring a floating H suffix (the distant past tense, for example). Those in group 2 end in a falling tone only in the imperative mood. Group 3 verbs are never realized with a final falling tone, except when segmental suffixes other than the final vowel have been added. The variety of behavior which is typical of these three groups is illustrated in (13)–(15).

(13) Infinitive forms of groups 1, 2, and 3 verbs

	H verb root	L verb root
Group 1	<i>fólà</i> ‘to sweep’	<i>bègà</i> ‘to carry’
Group 2	<i>déénà</i> ‘to let alone’	<i>sìsè</i> ‘to descend’
Group 3	<i>húmè</i> ‘to go out’	<i>mànà</i> ‘to finish’

(14) Imperative forms of groups 1, 2, and 3 verbs

	H verb root	L verb root
Group 1	<i>fóláà</i> ‘sweep’	<i>bègáà</i> ‘carry’
Group 2	<i>déénáà</i> ‘let alone’	<i>sìséè</i> ‘descend’
Group 3	<i>húmé</i> ‘go out’	<i>màná</i> ‘finish’

(15) Distant past (PST₃) forms of groups 1, 2, and 3 verbs

	H verb root	L verb root
Group 1	<i>fóláà</i> ‘swept’	<i>bègáà</i> ‘carried’
Group 2	<i>dééná</i> ‘let alone’	<i>sìsé</i> ‘descended’
Group 3	<i>húmé</i> ‘went out’	<i>màná</i> ‘finished’

All the words in group 2 (except *sisé*) have long vowels (i.e., two TBUs) as their main vowel. These words probably developed historically from roots with various suffixes, but today appear to be functioning as verb roots on their own.

Tone patterns of some verbs may change according to the suffixes they bear or with variation in semantic content. Any verb stem which includes the suffix *-an* (progressive) or *-i* (causative) is always moved to group 1. Verb stems with the suffix *-ed* (diminutive), *-eg* (intensive), or *-en* (applicative)

are always moved to group 2. The suffix *-on* (reversive) is usually found in group 1, but may also be group 2, depending on the semantic content of the word. Verbs in group 3 do not have suffixes.

As an example of a verb whose tone pattern changes with variation in semantic content, consider the group 1 verb stem *bàn*, which has the unmarked meaning ‘to read a book’. In the imperative mood and the tenses marked by H, it is pronounced *bàñáà*. However, if this verb is used to mean ‘to read something short’, such as a title, or ‘to read for only a moment’, it takes the tone patterns of group 2 verbs. Certain other verbs in group 1 also behave in this way.

Other verbs may change their tone patterns by the addition of a segmental suffix. For example, the verb *fól*, ‘to sweep’, cannot be pronounced *fólá* in the past tense to mean ‘swept a little, for only a moment’. The diminutive suffix *-ed* must be added to make the verb *fólèdà* (infinitive). This verb meaning ‘to brush something off’ or ‘to sweep for a moment’ follows group 2 tone patterns.

A summary of the surface tonal phenomena exemplified in (13)–(15) is given in (16) with H verb roots above L roots.

(16) Surface tone summary chart

	INF	IMPV	PST3
Group 1	HL	HF	HF
	LL	LF	LF
Group 2	FL	HF	HH
	LL	LF	LH
Group 3	HL	HH	HH
	LL	LH	LH

A possible explanation for the behavior of verbs in these three groups is proposed in §2, immediately following.

2. Verbal class markers

The differences in the tone patterns of verbs cited in examples (13)–(15) may be accounted for by positing an underlying tone for each verb which

acts as a verbal class marker.³ Verbs will then have a lexical tone carried by the root, and also either a H, L, or Ø class marker as indicated in (17).

(17) Underlying tone patterns (lexical tone + class marker)

	Class	Underlying	Examples
Group 1	L	H-L, L-L	fólà, bègà
Group 2	Ø	H-Ø, L-Ø	dééna, sise
Group 3	H	H-H, L-H	húmé, màná

These verbal tone class markers appear last in the string of tones mapped onto the verb; that is, the lexical tone, tense, mood, etc. are mapped onto the verb before the class marker. Examples of this mapping order and the tone rules needed to derive correct surface forms are discussed in §3.

3. Tone rules

In tonal derivations in focus in this section, three tones are usually mapped onto a verb—the lexical tone of the verb root, the tense-mood tone, and the verb class tone. The various underlying tone patterns are those shown in (18), where H verb roots are above L roots.

(18) Underlying tone summary chart

	Class	INF	1MPV	PST3
Group 1	L	H-L-L	H-HL-L	H-H-L
		L-L-L	L-HL-L	L-H-L
Group 2	Ø	H-L-Ø	H-HL-Ø	H-H-Ø
		L-L-Ø	L-HL-Ø	L-H-Ø
Group 3	H	H-L-H	H-HL-H	H-H-H
		L-L-H	L-HL-H	L-H-H

³These tonal suffixes appear to mark inherent aspect in some sense. Most Class L verbs are actions which are repetitive or occur over a period of time. Examples are the verbs *dùnè* ‘run’, *bègà* ‘carry’, *bàñà* ‘read’, *fólà* ‘sweep’, and *bàñà* ‘weep’. Class H verbs tend to have a perfective or stative aspect; they never have a segmental suffix other than the final vowel. Examples are *màná* ‘finish’, *húmé* ‘go out’, *bòlà* ‘arrive’, *fáà* ‘give’, and *fóà* ‘resemble’. Most Class Ø verbs have a segmental suffix -ed, -eg, or -en. There appear to be restrictions of occurrence such that verbs with these segmental suffixes may not take a H or L suffix. There are exceptions in all three classes. More data are needed to determine if a meaning can be attached to these tones.

In the following sections, tone rules are posited which make it possible to derive surface phonetic tones from the underlying ones of (18).

3.1. Lexical rules. According to lexical phonology (Pulleyblank 1986), tones are mapped onto tone-bearing units in a one-to-one relationship from left to right according to language-specific rules (association conventions). These rules are cyclic; they apply to the output of every morphological process. They are also subject to the Strict Cycle Condition: “A rule may only apply on any given cycle if its structural description has been derived on that cycle” (Pulleyblank 1986:3). Cycles are represented by square brackets and work from the root outwards.

L-spread. A lexical L-spread rule can account for the differences in the surface forms of the verbs *bien* and *biene* presented in (12) above. The rule may be formalized as in (19). In this rule, L is automatically associated with the first TBU. This association is represented by a solid line. The tone then spreads to all remaining TBUs on that cycle. This second association is represented by a broken line.

(19) L-spread rule



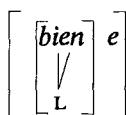
The following derivation can now be proposed for L CVVC verb stems in the zero tone class, as in (20).

(20) Derivation of L verb stem *bien* + H tense

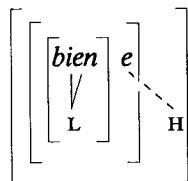
Cycle 1: Stem, association conventions, L-spread rule



Cycle 2: Final vowel



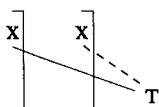
Cycle 3: Tonal tense marker, association conventions



Note that in Cycle 3 the **H** automatically associates with the first available TBU (moving from the left, a fact which will be important below), in this case the final vowel. This process correctly derives the form *biené* for tenses requiring a **H** suffix.

t-spread. For cvvc verbs with **H**, a second lexical rule is needed, as formalized in (21).

(21) Tone-spread rule



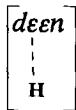
As in the **L**-spread rule, the automatic association of **T** to the first available TBU is represented by a solid line and the subsequent spread by a broken line. The rule says that any tone which is already associated to a previous syllable is additionally associated to any unassociated syllables between that syllable and the tone.

The derivation for the word *déena*, ‘to let alone’, in a tense requiring **L** is now possible, as indicated in (22). Note that **T**-spread occurs only when brackets intervene between the two TBUs and the unassociated tone. Were this not the case, the **H** associated with the verb root could use this rule to spread to the second vowel of the root in cycle 1 and the wrong form **déénà* would be derived rather than the correct form *déénà*.

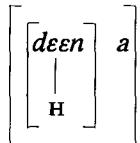
It should also be noted that it is crucial that our association conventions associate floating tones to the leftmost of any unassociated TBUs but that they do not associate unassociated TBUs to already associated tones. These specific association conventions combine with the rules mentioned so far to produce an important difference in Nugunu verb roots; namely, the second TBU of a long verb root takes its tone from the left if the verb root tone is **L** and from the right if the verb root tone is **H**.

(22) Derivation of H verb stem *déen* + L tense marker

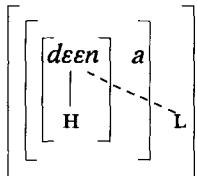
Cycle 1: Stem, association conventions



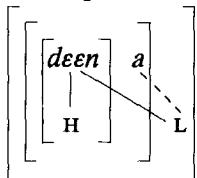
Cycle 2: Final vowel



Cycle 3a: L tense marker, association conventions

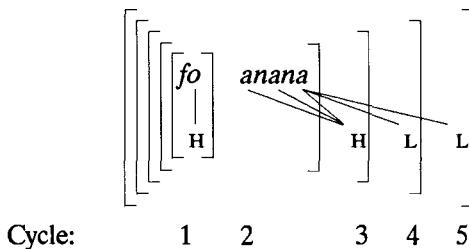


Cycle 3b: Tone spread rule



The T-spread rule can affect more than one syllable, if more than one exists without a tone on it. An example of this is given in (23). In this derivation, it is important to realize that when two similar tones (like the two final L tones) attach to a single TBU, they sound no different than a single tone attached to that TBU.

- (23) Derivation of L verb *fóàñàñà* (*fó* ‘resemble’ + *-anana* (PROG)) imperative



Tone: 1 lexical, 2 progressive, 3 imperative, 4 mood, 5 class

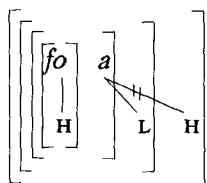
Rules in operation: T-spread

Surface realization: *fóánánáà*

Lexical rise simplification. Most of the verbs discussed above under L-spread and T-spread belong to Class *ø*; there was no H or L class marker to be mapped onto these verbs in addition to the lexical tone and the tonal tense marker. Additional lexical rules are needed, however, to correctly derive the surface forms of H and L verbs. The first of these rules is given in (24). A rising tone is never realized on a single TBU in Nugunu. This means that whenever a L-H sequence occurs on a single TBU, only the L is pronounced; H is dissociated by the rule and is left floating, as in (25).

- (24) Lexical rise simplification rule



(25) H verb (*fóá*), present tense

Cycle: 1 2 3 4

Tone: 1 lexical, 3 tense, 4 class

Rules in operation: rise simplification rule

Surface realization: *fóá*

If this example contained a word beginning with H after *fóá*, the high tone on the following word would occur on a lower register. Thus the H left floating does not in any way block the normal register lowering process between an associated L and an associated H.

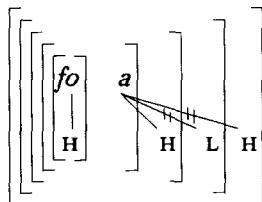
Lexical fall simplification. In certain circumstances, a further fall simplification rule operates on the output of the preceding rise simplification rule. This occurs whenever a series of H-L-H are all associated onto a single TBU. The lexical fall simplification rule is formalized in (26),⁴ which states that whenever a H-L sequence is associated with a single TBU and is followed by an unassociated H (H) (from the operation of the rise simplification rule), the L tone of the rise is disassociated and left floating. This rule can be seen to be operating in the derivation in (27).

(26) Lexical fall simplification rule



⁴On the postlexical level, H spreads and dissociates a following L when there is a H-L-H sequence. The same process may occur on the lexical level. The first H may spread and dissociate the L; however, because the second H is not associated and is not realized, the effect of the L is lost.

- (27) H verb (*fóá*) imperative



Cycle: 1 2 3 4 5

Tone: 1 lexical, 3 imperative, 4 mood, 5 class

Rules in operation: rise simplification rule, fall simplification rule

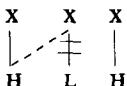
Surface realization: *fóá*

Note that the rise simplification rule feeds the fall simplification rule and that the output of the two rules is two floating tones which are not pronounced. Even if a word beginning with H had been added after the verb in this example, that H would not occur on a lower tone register, but would maintain the same level as the high tones of *fóá*. It appears that the floating H blocks the preceding floating L from triggering register lowering (which would normally take place if only a single floating L separated two associated Hs).

3.2. Postlexical rules. The lexical rules proposed above are operative only during the derivation of a word. The following rules are postlexical; they come into play only after the derivation of a word is complete and all relevant lexical rules have been applied.

H-spread. The H-spread rule states that when there is a H-L-H sequence across either a word or morpheme boundary, the first H spreads to the TBU carrying the L and dissociates it, as formalized in (28).

- (28) High spread rule

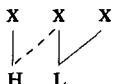


The effect of the floating L is not lost, however; any H following it will be lower in pitch than the preceding H. This lowering of a tone register after a H occurs both within words and across word boundaries, as illustrated in (29) and (30).

- (29) *Bèlà bē ná lē kótáàlú.* → *Bèlà bē ná lē kótá!lú.*
 clothes they already are dry
 The clothes are already dry.
- (30) *À gólò kóls.* → *À gólò !kóls.*
 he take rat
 He takes the rat.

Partial H-spread. A second rule is needed to account for the spread of H in H-L-L sequences.

- (31) Partial H-spread

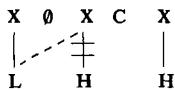


This rule says that when H is followed by L occupying more than one TBU, the H spreads onto the next TBU but does not dissociate the L. This partial spread occurs both within a word and across word boundaries, as shown in (32) and (33).

- (32) *gò bándègènà* → *gò bándéègènà*
 INF assemble
 to assemble
- (33) *Bá bòlà.* → *Bá bòòlà.*
 they arrive
 They arrive.

Optional postlexical rise simplification. When a rising tone occurs over two adjacent TBUs (i.e., with no intervening consonant), and it is followed by H, the L of the rise may spread and dissociate the H. The realization is a level L followed by a level H. The rule is formalized as in (34). It operates only if the rise over two adjacent TBUs is followed by a consonant and not a third adjacent TBU. Examples of this rule operating within and across word boundaries are shown in (35) and (36).

- (34) Optional postlexical rise simplification rule



- (35) $\begin{array}{ccccccc} L & & L & H & H & & \\ | & & | & \diagup & \diagdown & & \\ A & gaa & hum-e. & & & & \\ \text{he} & \text{FUTI} & \text{go}^\wedge \text{out-FV} & & & & \\ \text{He will go out.} & & & & & & \end{array} \Rightarrow \begin{array}{c} \grave{A} \\ g\grave{a} \\ h\acute{u}m\acute{e}. \end{array}$

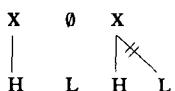
- (36) $\begin{array}{ccc} \grave{A} & mb\grave{a} & b\grave{e}\text{-}\acute{a}n\acute{a}\grave{n}\grave{a}\grave{a}. \\ \text{he} & \text{PST3} & \text{has-PROG-FV} \\ \text{He had.} & & \end{array} \Rightarrow \begin{array}{c} \grave{A} \\ m\grave{b}\grave{a} \\ b\grave{e}\acute{a}n\acute{a}\grave{n}\grave{a}\grave{a}. \end{array}$

In (37), both the H-spread and the postlexical rise simplification rule are in operation. The H on *gàá* (immediate future) spreads to the following L vowel. Because this vowel is followed by H, the L is dissociated. There is now a rising tone followed by H. The L on *gàá* then spreads and disassociates the H, as shown.

- (37) $\begin{array}{ccccccc} L & & L & H & L & H & \\ | & & | & \diagup & | & & \\ A & gaa & bol-a. & & & & \\ \text{he} & \text{FUTI} & \text{arrive-FV} & & & & \\ \text{He will arrive.} & & & & & & \end{array} \Rightarrow \begin{array}{c} \grave{A} \\ g\grave{a} \\ b\grave{o}!l\acute{a}. \end{array}$

Optional postlexical fall simplification. Because of H-spread, it is possible to have a sequence of tones H:F on contiguous vowels (i.e., without intervening consonants). This sequence may be simplified to IH by dissociating the final L, as formalized in (38). This rule states that a falling tone after a downstep may be simplified to IH, as illustrated in (39). Note that the H-spread rule has fed the optional fall simplification rule by creating a floating L (\grave{L}) in the appropriate place.

- (38) Optional postlexical fall simplification rule



(39)		\rightarrow	$\grave{A} \text{ gaa } nɔ!ɔ̄.$	\Rightarrow	$\grave{A} \text{ gaa } !nɔ̄.$
	A gaa nɔɔ.		he FUT1 throw		
	He will throw.				

4. Phonetic realization rule

In Nugunu, any associated H following L will be lower in pitch than all Hs preceding the L. This remains the case even if the L has been dissociated and is not realized as L in the surface phonetic realization, as in (8) above. This lowering of the tone register after L may be formalized as in (40), where the L may or may not be associated to a preceding TBU.

(40) Register-lowering rule

$$\begin{array}{ccc} & X & \\ & | & \\ L & H & \rightarrow \quad [+1 \text{ pitch}] \end{array}$$

This rule assumes the common convention that high tones are numbered 1, low tones 3, and the adding of +1 pitch to all subsequent tones results in a lowering of the phonetic pitch. In Nugunu, as in many Bantu languages, the interval between H and L remains constant (two steps), so that both high and low tones undergo the register lowering. Utterances may become progressively lower if the register is lowered several times before being reset (usually at a major punctuation break). The register-lowering rule thus accounts for both downstep and downdrift phenomena whether or not the preceding L is associated.

5. Residue

Five irregular verbs of the vc syllable type have been observed to date. (41) shows the unusual tone patterns of each of these verbs in seven tenses and the imperative mood.

(41) Exceptional verb patterns (all with vc verb stems)

	<i>ob-a</i> ‘fall’	<i>ab-a</i> ‘share’	<i>oy-a</i> ‘say’	<i>ɔy-ɔ</i> ‘live’	<i>oy-o</i> ‘aid’
PRES PST1, FUT2	L-L	L-L	L-L	L-L	L-L
PST2, PST3 FUT1, FUT3	H-H	H-HL	H-HL	H-HL	H-HL
IMPV	H-H	H-HL	H-HL	H-HL	L-HL

Additional comparative research is needed to explain these tonal patterns, since the origin of their irregularities is probably historical. One possible avenue of research would be to examine these verb roots to see if they might be lexically toneless, and if so, whether related languages exhibit similar toneless characteristics.

6. Conclusion

The most common tone changes in Nugunu can be accounted for by the tendency of Hs to spread to the right. Unlike some Bantu languages, segmental markers for tenses are still present, so that there are few tones which are not lexically associated to segments; most tone changes are fairly regular and predictable. Exceptions to this are floating tones marking verb classes, which may have been associated historically with segmental morphemes. Further research and comparison to related languages may explain the development of these verb classes as well as the unusual tonal behavior of certain vc verbs.

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Section Two

Chadic Language

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Tonal Behavior of Podoko Verbs in Independent Clauses

Jeanette Swackhamer

Abstract

This paper attempts to be a comprehensive presentation of the tonal behavior of Podoko verbs in unfocused, independent clauses. The basic two-tone system is complicated by the fact that low tones can be downstepped. While some of the downstep is predictable on the basis of depressor consonants, in other cases it is an inherent part of a grammatical marker. The most interesting of these is the clause-initial downstep signaling present tense. Spectrographs are included to confirm this unusual position for downstep.

The interplay between consonants and tone has led to positing four classes which divide into six subclasses. The paper examines the sixteen possible constructions found in independent clauses and the three types of verbal extensions, and includes an appendix of 627 verbs separated into their respective tone classes and subclasses. Finally, the paper presents some data on the interaction between tones and vowels in plural verbs. This, together with a possible historical hypothesis for the genesis of the present verb classes, could be of special interest to Chadicists. In all, this article presents a needed complement to the earlier article on Podoko nouns (Anderson and Swackhamer 1981).

Résumé

Cet article tente de présenter une vue de l'ensemble du système tonal du verbe podoko dans les phrases indépendantes, sans emphase. Le podoko est, à la base, une langue à deux tons, mais le ton bas peut se manifester après une faille tonale. La plupart des cas de ces failles tonales sont prévisibles selon le placement d'une consonne d'abaissement. Cependant, la faille tonale est aussi la marque des catégories grammaticales, la plus répandue de ces catégories étant la faille tonale au début de la phrase qui signale le temps

présent. La présence de cette faille tonale au début de la phrase est établie par l'aide des spectrogrammes.

Les verbes en podoko se répartissent en quatre classes selon leurs consonnes et leurs tons, deux de ces classes ayant des sous-classes, ce qui donne six classes en tout. Puisque l'on tente de présenter une vue de l'ensemble du système tonal, les 16 formes du verbe dans la phrase indépendante sont examinées, ainsi que les trois sortes d'extensions. Un appendice de 627 verbes, répartis selon leurs classes, se trouve à la fin. Pourque cette description soit complète et qu'elle couvre les intérêts divers, l'influence des voyelles sur le ton dans le pluriel du verbe est abordée et une hypothèse du développement des classes tonales est tentée. C'est souhaité que cet article soit le complément attendu de l'article précédent sur les noms en podoko (Anderson et Swackhamer 1981).

This paper¹ attempts to be a comprehensive presentation of the tonal behavior of Podoko² verbs in unfocused, independent clauses. Like many Chadic languages, Podoko has basically a two-tone system. While some of the related languages in the Central or Biu-Mandara branch of the Chadic family have developed into a three-tone system, Podoko has maintained the two-tone system even though the feature of downstep allows tones to be realized phonetically on two separate levels. Reasons for analyzing the tonal data as two tones plus downstep are given, as well as detailing the way in which Podoko downstep differs from similar systems in Niger-Congo languages. One of the most unusual features of Podoko is a clause-initial downstep to mark present tense. The paper presents visual proof of this downstep position by means of two spectrographs.

A previous paper on tone in Podoko nouns (Anderson and Swackhamer 1981) showed the correlation of consonants to tone, a feature noted in other Chadic languages. The present paper complements the one on nouns and shows that the same consonant influence on tone register is also operative with verbs. What is striking about this correlation, however,

¹Permission to carry out this research was kindly given by the Ministry of Higher Education, Computer Services and Scientific Research of the Republic of Cameroon (MESIRES). My appreciation goes to Ndoula Lagona, who patiently provided the data for this paper and to Gigla Thomas, who checked the various paradigms and examples. This present study is built upon the previous work done on Podoko syntax by Elizabeth Jarvis. The appendix consists of an expansion and revision of her *Podoko Verb Dictionary*. Thanks, too, goes to Thilo Schadeberg for his help in sorting out the various tone classes, to Stephen C. Anderson for his editorial comments and his invaluable help in charting the verbal system, and to Martin Engeler for his help with CECIL which resulted in the spectrographs found in the paper.

²Podoko (Parəkwa, as they refer to themselves) is a Chadic language (Central or Biu-Mandara branch, Wandala group) spoken by 25,000 or more speakers who live in and around the far northern tip of the Mandara Mountains in the Far North Province of Cameroon, Mayo-Sava Division, Mora Subdivision. (The estimation of the population is taken from immunization records of health-care workers in the area.)

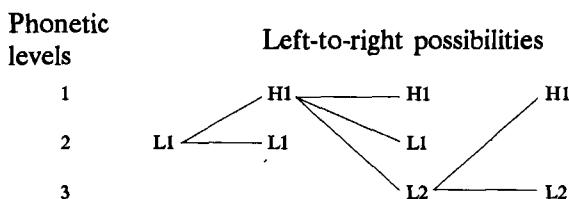
that syllables with a depressor consonant are realized on high tone (with downstep of low tone following) instead of the more expected low tone. The interplay between consonants and tone has led to positing four classes of verbs.

The paper examines the sixteen independent clause constructions and three types of verbal extensions. It includes an appendix of 627 verbs separated into four tone classes plus two subclasses. Some Chadicists will appreciate the section on plural verbs showing the interaction between the tone pattern and the *a* or *ə* vowel of the verb. Other Chadicists can consider the possible historical hypothesis advanced to explain how the underlying tone patterns may have evolved from simpler combinations of high and low tones.

1. Three tones in two registers

In Anderson and Swackhamer 1981, three phonetic levels of tone were illustrated. Despite these three levels, Podoko was shown to have a two-tone system since the downstepped low tone occurs only after a high tone (H1) and in the environment of a depressor consonant. Therefore, the distribution of tones is as follows (with L1 indicating a nondownstepped low and L2 a downstepped low tone):

(1) Phonetic tone distribution



L2 can be phrase initial due to grammatical downstep, which is the subject of this paper. The L (low tone) on the first register can be followed only by a H (high tone) in the first register (value 1) or another L on the same register (2). A H in the first register (height 1) can be followed by another H of the same height, or by a L of the first register (height 2), or a L in the second register (height 3). A L in the second register can be followed only by a H in the first register (height 1) or another L of the same register (height 3). Thus, we are not dealing with a three-tone system, but a two-tone system that has three heights and two registers.

The verbs, which are the focus of this article, follow a pattern similar to that of nouns—there are three tone heights but two tone registers. If the H is followed by a L syllable starting with a depressor consonant, the L is slightly lowered as in (2).³ If the syllable does not start with a depressor consonant, the L is not lowered, as in (3). For a list of depressor consonants, see §2.

- (2) *A ndáva ndava nda.*
 2 1 3 3 3 3
 ~AR ask RE INDEF
 Someone asked.
- (3) *A ndála ndəla nda.*
 2 1 2 2 2 3
 ~AR cut RE INDEF
 Someone cut it in two.

Podoko displays phonetic downtilt at the end of a phrase with the following results: clause-final L always occurs on level 3; clause-final H after H or nondownstepped L is realized as a falling tone from level 1 to 2; clause-final H after downstepped L occurs on level 2.

Present tense (perfective or imperfective) is marked by two tonal phenomena. The first is a DOWNSTEP feature which precedes the entire clause. The second is a replacive L that overlays the lexical tones of the verb, resulting in tonal neutralization of the various tone classes. In the case of LL and LH verbs, which already have a L pattern in the past construction, the overlaying of the replacive L in the present tense does not change the lexical tone of the verb. However, the overlaying of the present-tense L on a L verb fails to signal present tense, which in these constructions, is signalled only by the initial downstep feature. For these verbs, therefore, the only difference between past and present is in the downstep feature, as in (4) and (5). The phonetic glide from level 2 up to level 1 before the comma in these examples is one of the options for a H syllable, but only when immediately preceding a comma.

³The following abbreviations are used in illustrations: AR aorist, DS direct speech marker, END end of clause, FS fronted subject marker, FUT future tense, IND indicative mood, IMPV imperative mood, IMPFV imperfective aspect, ~AR nonaorist, NEG negative, OPT optative mood, PRF perfect, PRFV perfective aspect, PRES present tense, PST past tense, RE reduplicaiton, REFL reflexive/reciprocal marker, 1 first person, 2 second person, 3 third person, INDEF indefinite third person, s singular, p plural, i inclusive, and x exclusive.

(4) Perfective past

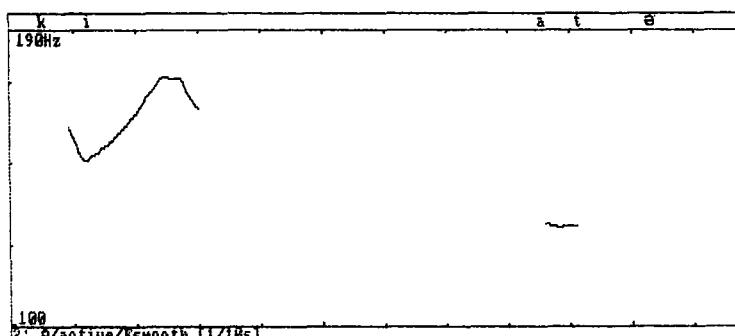
Ngá ndi takiná laki, a təha təha ka.
 1 3 3 3 1 2 2-1 2 2 2 2 3
 DS INDEF to[^]him END ~AR hit RE you
 Someone said to him, you hit it.

(5) Perfective present

Ngá ndi takiná laki, ! a təha təha ka.
 1 3 3 3 1 2 2-1 3 3 3 3 3
 DS INDEF to[^]him END PRES[^]~AR hit RE you
 Someone said to him, you may hit it.

In order to prove the presence of these clause-initial downsteps, the preceding two sentences were spoken into a tone analyzer to produce digitalized evidence of their actual phonetic pitch. In order to correctly interpret the resulting spectrographs, the reader must be aware of one phonetic phenomenon. The *h* of the verb *təha* 'to hit' causes the preceding *a* to devoice with the result that the tone analyzer does not register its pitch. The pause in speech (signified by a comma) results in an interval between the clause-final *laki* and the clause-initial *a* (where the presence of the tone is crucial). The spectrographs for the two sentences have been abbreviated to show the part where the pitch of *a* can be compared to that of the preceding syllable of the tone frame. The two contrasting spectrographs are presented in (6) and (7).

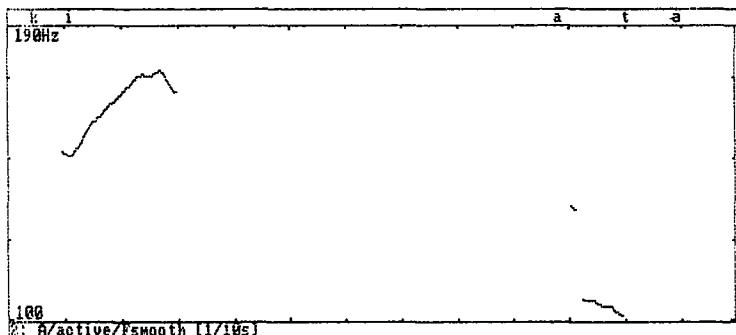
(6) Perfective past



In (6), the upglide on the clause-final syllable *kí* starts at 150 Hz and goes as high as 176 Hz. This upglide is followed by a pause and then a

relatively level L which varies from 131–130 Hz. This example must be compared with (7) to see the difference in the level of the L. In (7), the clause-final upglide starts at 151 Hz and goes as high as 177 Hz, followed by a downstepped L which varies from 106–101 Hz.

(7) Perfective present



In these two examples, we see two low tones on the same segmental a following the same upglide. The difference in their relative tone height, as measured in Hz, is 25–30. The interval is easily perceived and is used in Podoko to signal the lowered downstepped level for L. These clause-initial downstep features are more difficult to perceive at the beginning of a sentence than in the middle. The drop is significant, however, and is evident to Podoko listeners, although it might take some time to get used to a new person's pitch range. The fact is that Podoko speakers do not have much of a problem with this clause-initial downstep feature or they would not use it as an indicator (sometimes the only one) of something as important as present tense.

For the rest of this paper, phonetic downstep is not marked, L is also unmarked, H is marked by an acute accent (') over vowels, and grammatical downstep is marked by an exclamation point (!).

2. Lexical tone

The perfective past indicative provides the most productive frame for separating verbs into tone classes. By examining this frame, verbs are

separated into four tone classes, two of which have subclasses based on consonant types. The six resulting classes are shown in (8).⁴

(8) Verb classes based on tone pattern and consonant type

	Tones	Consonant of first syllable
Class 1	LL	D, N
Class 2	LL H	D, N
Class 3a	HL	D
Class 3b	LH	N
Class 4a	HL C	D
Class 4b	LH C	N

The formula for the perfective past indicative without an affix is presented in (9).

(9) Past perfective indicative

a V-a V-ə

One example from each class of verbs in the past perfective construction now follows. The first example is from class 1, which is a straightforward LL class with or without a depressor consonant.

(10) A təha təha nda.

~AR hit RE INDEF

Someone hit it.

The next example is from class 2, which has a LL pattern, followed by a floating H which, when the first verb has no extensions, associates onto the first syllable of tone reduplicated verb.

⁴ Depressor consonants (D) are listed in (a). All others are nondepressor consonants (N). C is a floating tone that causes the tones of one verb to copy over to a second, reduplicated verb.

(a) b d dz g gw
mb nd ndz ng ngw
v z zl

- (11) *A baka bákə nda.*
 ~AR do RE INDEF
 Someone did it.

The effects of this floating H also show up in aorist verbs where it docks onto the enclitic pronoun *-nga* (3s). (12) and (13) compare an aorist class 2 verb (LL H) with a past perfective class 1 verb (LL).

- (12) Class 2 (LL H)

Baka-ŋá
 do-3s
 He did it.

- (13) Class 1 (LL)

Təha-ŋa.
 hit-3s
 He hit it.

Classes 3 and 4 both have a lexically associated H. Both are subdivided into two subclasses since the placement of the H can be predicted on the basis of the consonant type of the first syllable. As seen in (8), if the first syllable of the verb contains a depressor consonant, the H is manifested on the first syllable (classes 3a and 4a). If the first syllable contains a neutral consonant, the H is manifested on the second syllable,⁵ regardless of whether that syllable contains a depressor or neutral consonant.

The relationship between consonants and tone has been noted in other Chadic languages. In Ouldeme (de Colombel 1986), a neighboring language to Podoko, and in Mulwi (Tourneux 1982), syllables with a depressor consonant take L, as expected. In Podoko verbs, however, the syllable with the depressor consonant takes H.

Examples from class 3 are given in (14) and (15).

⁵ There are a few verbs with three syllables, very few which have four, and one verb which has five syllables. If a trisyllabic verb contains H and no depressor consonant, the H may optionally appear on the second or third syllable, as in *ymadákwa* 'to whiten' and *mətsaká* 'to grill'.

(14) Class 3a (HL)

A ndáva ndavə nda.
 ~AR ask RE INDEF
 Someone asked.

(15) Class 3b (LH)

A dəgá dəgə nda.
 ~AR pound RE INDEF
 Someone pounded it.

The difference between classes 3 and 4 is that class 4 has a floating copy tone which causes the tones of *v_i* to pattern onto the second verb when the first one has no affix. Class 4 is a very small class. To date, there are only 14 verbs in this class out of a corpus of 627.

(16) Class 4a (HL ç)

A ndáha ndáhə nda.
 ~AR fatten RE INDEF
 Someone became obese.

(17) Class 4b (LH ç)

A maslá maslə nda.
 ~AR leave RE INDEF
 Someone left it.

From the above material, we see that verbs in Podoko fall into four tonal classes, with classes 3 and 4 being divided into subclasses due to the consonant type of the first syllable. The following section looks at the total verbal system and the behavior of each of these classes within that system.

3. Grammatical tone

This study is restricted to verbs in independent clauses which have none of their constituents specifically focused. Verbs of this sort may have as many as sixteen forms which distinguish categories of tense, aspect, and mood. The names used in this study for these forms and the elements

which mark them are presented in (18). A few summary remarks may be made to characterize the way each of the forms is marked.

(18)	1. imperfective present indicative	<i>! a</i>	<i>yV-ə</i>
	2. imperfective unmarked past indicative	<i>a</i>	<i>yV-ə</i>
	3. imperfective marked past indicative	<i>sa</i>	<i>yV-ə</i>
	4. imperfective future indicative	<i>a /da</i>	<i>yV-ə</i>
	5. perfective unmarked past indicative	<i>a</i>	<i>V-a</i>
	6. perfective marked past indicative	<i>sa</i>	<i>V-a</i>
	7. perfective future indicative	<i>a /da</i>	<i>V-a</i>
	8. imperfective marked imperative	<i>/da</i>	<i>yV-ə</i>
	9. imperfective unmarked imperative		<i>yV-ə</i>
	10. perfective marked imperative	<i>/da</i>	<i>V-a</i>
	11. perfective unmarked imperative		<i>V-a</i>
	12. perfect indicative	<i>a</i>	<i>V-ə</i> <i>ç</i> <i>V-a</i>
	13. perfective present optative indicative	<i>! a</i>	<i>V-a</i> <i>V-ə</i>
	14. aorist unmarked past indicative		<i>V-a</i> <i>H</i>
	15. aorist marked past indicative	<i>sa</i>	<i>V-a</i> <i>H</i>
	16. aorist future indicative	<i>/da</i>	<i>Va-a</i> <i>H</i>

Aorist forms are marked by a floating *H* which occurs on the first syllable of a following noun or a following third-person indefinite pronoun; nonaorist forms tend to be marked by clause-initial *a*. Aorist forms may further be past (marked by *sa* or unmarked) or future (marked by */da*). Nonaorist forms are perfective or nonperfective (following definitions of Comrie 1976), imperfective forms being marked by palatalization and perfective forms by reduplication. Perfect has a copy tone which copies the tone of the first verb onto the reduplicated form that follows. Past is optionally marked by *sa* and future is marked by */da*.

3.1. The grammatical downstep of present tense. Present-tense forms are always distinguished from nonpresent-tense forms. Clause-initial downstep (!) and tonal neutralization of the verb classes mark present tense. Imperfective present may also indicate near future, translated in first-person plural 'Let us do...'; perfective present has optative force. This latter form is used to counter-assert, as in 'He can do it'.⁶

⁶Stative verbs, such as *ngwá* 'to want, to love', *tsawa* 'to be good', *tsama* 'to know', and *sla ñ* 'to be sufficient', are not dealt with in this study; but the facts concerning present tense differ slightly in respect to them. Specifically, stative verbs lack imperfective forms altogether and perfective forms, rather than distinguishing past and optative meaning, distinguish present and optative meaning by nondownstepped and downstepped forms, respectively.

Note that the use of tone to mark verbal categories in Biu-Mandara languages is well documented (Wolff 1979). In Mulwi (Tourneux 1982), á marks inaccompli and à marks accompli, which is the opposite of Podoko, whereas Ouldeme (de Colombel 1988) works more like Podoko with forms corresponding to nondownstepped L for aorist and accompli, à for hortatory, and á for a potential but nonassumed situation, which corresponds to Podoko downstepped L.

Nondownstepped, unmarked indicative forms (2, 3, 5, 6, 14, 15) have past meanings and may collocate with the time adverb *ndágwa* 'yesterday' but not with *yusədá* 'tomorrow'. Downstepped indicatives (4, 7, 8, 10, 16), on the other hand, do not collocate *ndágwa* 'yesterday' but may with *yusədá* 'tomorrow'.

The sixteen forms of a typical verb from each of the six tone classes are illustrated in (19)–(24).

(19) Class 1 (LL) paradigm, *təha* 'to hit'

- | | |
|--|-------------------------------|
| 1. ! <i>A ytəha vala ndá.</i> ⁷ | 'Someone is hitting it.' |
| 2. <i>A ytəha vala ndá.</i> | 'Someone was hitting it.' |
| 3. <i>Sa ytəha vala ndá.</i> | 'Someone was hitting it.' |
| 4. <i>A !da ytəha vala ndá.</i> | 'Someone will be hitting it.' |
| 5. <i>A təha təha nda.</i> | 'Someone hit it.' |
| 6. <i>Sa təha təha nda.</i> | 'Someone hit it.' |
| 7. <i>A !da təha təha nda.</i> | 'Someone will hit it.' |
| 8. <i>!Da ytəha sləndza!</i> | 'Hit (FUT) the friend!' |
| 9. <i>yTəha sləndza!</i> | 'Hit the friend!' |
| 10. <i>!Da təha təha sləndza!</i> | 'Hit (FUT) the friend!' |
| 11. <i>Təha təha sləndza!</i> | 'Hit the friend!' |
| 12. <i>A təha təha sləndza.</i> | 'The friend is hit.' |
| 13. <i>! A təha təha nda.</i> | 'May someone hit it.' |
| 14. <i>Təha ndá.</i> | 'Someone hit it.' |
| 15. <i>Sa təha ndá.</i> | 'Someone hit it.' |
| 16. <i>!Da təha ndá.</i> | 'Someone will hit it.' |

(20) Class 2 (LL H) paradigm, *baka* 'to do'

- | | |
|---------------------------------|-----------------------------|
| 1. ! <i>A ybaka vala ndá.</i> | 'Someone is doing it.' |
| 2. <i>A ybaka vala ndá.</i> | 'Someone was doing it.' |
| 3. <i>Sa ybaka vala ndá.</i> | 'Someone was doing it.' |
| 4. <i>A !da ybaka vala ndá.</i> | 'Someone will be doing it.' |

⁷The third person impersonal pronoun *nda* carries a L unless influenced by a floating H following such words as *vala* H (third person singular direct object).

5. *A baka bákə nda.* ‘Someone did it.’
 6. *Sa baka bákə nda.* ‘Someone did it.’
 7. *A !da baka bákə nda.* ‘Someone will do it.’
 8. *!Da ybákə sləra.* ‘Do (FUT) work!’
 9. *yBákə sləra.* ‘Do work!’
 10. *!Da baka bákə sləra.* ‘Do (FUT) work!’
 11. *Baka bákə sləra.* ‘Do work!’
 12. *A bákə baka sləra.⁸* ‘The work is done.’
 13. *! A baka bákə nda.* ‘May someone do it.’
 14. *Baka ndá.* ‘Someone did it.’
 15. *Sa baka ndá.* ‘Someone will do it.’
 16. *!Da baka ndá.* ‘Someone did it.’

(21) Class 3a (HL) paradigm, *ndava* ‘to ask’

1. *! A yndava vala ndá.* ‘Someone is asking for it.’
 2. *A yndávə vala ndá.* ‘Someone was asking for it.’
 3. *Sa yndávə vala ndá.* ‘Someone was asking for it.’
 4. *A !da yndávə vala ndá.* ‘Someone will be asking for it.’
 5. *A ndáva ndava nda.* ‘Someone asked for it.’
 6. *Sa ndáva ndava nda.* ‘Someone asked for it.’
 7. *A !da ndáva ndava nda.* ‘Someone will ask for it.’
 8. *!Da yndávə sləra!* ‘Ask (FUT) for work!’
 9. *yNdávə sləra!* ‘Ask for work!’
 10. *!Da ndáva ndava sləra!* ‘Ask (FUT) for work!’
 11. *Ndava ndava sləra!* ‘Ask for work!’
 12. *A ndávə ndáva sləra.* ‘The work is asked for.’
 13. *! A ndava ndava nda.* ‘May someone ask for it.’
 14. *Ndava ndá.* ‘Someone asked for it.’
 15. *Sa ndáva ndá.* ‘Someone ask for it.’
 16. *!Da ndáva ndá.* ‘Someone will ask for it.’

(22) Class 3b (LH) paradigm, *dágə* ‘to pound’

1. *! A ydágə vala ndá.* ‘Someone is pounding it.’
 2. *A ydágé vala ndá.* ‘Someone was pounding it.’
 3. *Sa ydágá vala ndá.* ‘Someone was pounding it.’
 4. *A !da ydágá vala ndá.* ‘Someone will be pounding it.’
 5. *A dágá dágə nda.* ‘Someone pounded it.’
 6. *Sa dágá dágə nda.* ‘Someone pounded it.’

⁸Note that in this form, the copy tone of perfect indicative aspect takes precedence over the floating H, the LL of the first verb appearing in the reduplicated verb rather than HL.

- | | | |
|-----|------------------------------|--------------------------|
| 7. | <i>A !da dəgá dəgə nda.</i> | 'Someone will pound it.' |
| 8. | <i>!Da ydəgé slasla!</i> | 'Pound (FUT) the bone!' |
| 9. | <i>yDəgá slasla!</i> | 'Pound the bone!' |
| 10. | <i>!Da dəgá dəgə slasla!</i> | 'Pound (FUT) the bone!' |
| 11. | <i>Dəga dəgə slasla!</i> | 'Pound the bone!' |
| 12. | <i>A dəgá dəga slasla.</i> | 'The bone is pounded.' |
| 13. | <i>! A dəga dəgə nda.</i> | 'May someone pound it.' |
| 14. | <i>Dəga ndá.</i> | 'Someone pounded it.' |
| 15. | <i>Sa dəgá ndá.</i> | 'Someone pounded it.' |
| 16. | <i>!Da dəgá ndá.</i> | 'Someone will pound it.' |

(23) Class 4a (HL c) paradigm, *ndəha* 'to fatten'

- | | | |
|-----|--|---------------------------------|
| 1. | <i>! A yndəhə vala ndá.</i> | 'Someone is fattening it.' |
| 2. | <i>A yndəhə vala ndá.</i> | 'Someone was fattening it.' |
| 3. | <i>Sa yndəhə vala ndá.</i> | 'Someone was fattening it.' |
| 4. | <i>A !da yndəhə vala ndá.</i> | 'Someone will be fattening it.' |
| 5. | <i>A ndəha ndəhə nda.</i> ⁹ | 'Someone became fat.' |
| 6. | <i>Sa ndəha ndəhə nda.</i> | 'Someone became fat.' |
| 7. | <i>A !da ndəha ndəhə nda.</i> | 'Someone will become fat.' |
| 8. | <i>!Da yndəhə gana!</i> | 'Fatten (FUT) the squirrel!' |
| 9. | <i>yNdəhə gana!</i> | 'Fatten the squirrel!' |
| 10. | <i>!Da ndəha ndəhə gana!</i> | 'Fatten (FUT) the squirrel!' |
| 11. | <i>Ndəha ndəhə gana!</i> | 'Fatten the squirrel!' |
| 12. | <i>A ndəhə ndəhə gana.</i> | 'The squirrel is fat.' |
| 13. | <i>! A ndəha ndəhə nda.</i> | 'May someone become fat.' |
| 14. | <i>Ndəha ndá.</i> | 'Someone became fat.' |
| 15. | <i>Sa ndəha ndá.</i> | 'Someone became fat.' |
| 16. | <i>!Da ndəha ndá.</i> | 'Someone will become fat.' |

(24) Class 4b (LH c) paradigm, *masla* 'to leave'

- | | | |
|----|-----------------------------|---------------------------|
| 1. | <i>! A ymaslə vala ndá.</i> | 'Someone is leaving it.' |
| 2. | <i>A ymaslə vala ndá.</i> | 'Someone was leaving it.' |
| 3. | <i>Sa ymaslə vala ndá.</i> | 'Someone was leaving it.' |

⁹Class 4a has a floating copy tone which copies the tone pattern of the first verb onto the reduplicated verb in the perfective aspect when the verb has no affix. However, as numbers 10 and 11 show, this copy is not operative in imperatives, where this class acts like a regular 3a verb: the H shows up in the marked imperative on the first verb but not on the second (No. 10); and the unmarked imperative is marked by neutralization, i.e., there is no H (No. 11). Distinctions between classes 3a and 4a show up again, however, in the optative (No. 13). Both classes show neutralization in the first verb, but class 4a copies the basic HL onto the second verb while class 3a does not.

- | | |
|--|-------------------------------|
| 4. <i>A !da ymaslá vala ndá.</i> | 'Someone will be leaving it.' |
| 5. <i>A maslá maslá nda.</i> ¹⁰ | 'Someone left it.' |
| 6. <i>Sa maslá maslá nda.</i> | 'Someone left it.' |
| 7. <i>A !da maslá maslá nda.</i> | 'Someone will leave it.' |
| 8. <i>!Da ymaslá sländza!</i> | 'Leave (FUT) the friend!' |
| 9. <i>yMaslá sländza!</i> | 'Leave the friend!' |
| 10. <i>!Da maslá maslá sländza!</i> | 'Leave (FUT) the friend!' |
| 11. <i>Masla maslá sländza!</i> | 'Leave the friend.' |
| 12. <i>A maslá masla sländza.</i> | 'The friend is left.' |
| 13. <i>! A masla maslá nda.</i> | 'May someone leave it.' |
| 14. <i>Masla ndá.</i> | 'Someone left it.' |
| 15. <i>Sa maslá ndá.</i> | 'Someone left it.' |
| 16. <i>!Da maslá ndá.</i> | 'Someone will leave it.' |

3.2. The inherent downstep of several grammatical words. There are several grammatical words which always occur with downstep to a lowered L. These words are treated as having a downstep feature as part of their lexical specification. Sometimes this downstep precedes the L of the grammatical marker and sometimes it follows it. Whenever the marker follows the grammatical word, its lowering effect is not realized on the word itself, but on the word immediately following it. Some examples of sentences which contain such grammatical markers are given in (25)–(27)

(25) *!banda* 'if'

<i>!Banda ybakə sləri nda, a ngwá ngwə yá.</i>	3 3 3 3 3 3 3-1) 2 1 3 2
	if do work INDEF ~AR want RE is
If someone works, I want that.	

Note that the clause-final word *nda* in (25), which is not sentence final, has an optional glide to h. This glide before a comma is predictable and is thus a phonetic variant of L in a restricted environment.

¹⁰Class 4b acts like Class 4a in that the copy tone copies the pattern of the first verb onto the second verb in the perfective indicatives (Nos. 5–7). These two classes act differently, however, in the perfective imperatives (Nos. 10 and 11), where Class 4a does not copy the underlying tone pattern onto the second verb.

(26) *!da* (future)

<i>A</i>	<i>!da</i>	<i>ybakə</i>	<i>sləri</i>	<i>nda.</i>
2/3	3	3 3	3 3	3
~AR	FUT	do	work	INDEF
Someone is going to work.				

In (26) *!da* (future) can optionally pull a preceding *a* (nonaorist) down from its normal level 2 to level 3, resulting in phonetic variation, again in a very restricted environment.

(27) *aká!* (negative of subordinate clauses)

<i>A</i>	<i>ngwá</i>	<i>ngwə</i>	<i>yá</i>	<i>ngə</i>	<i>ndi</i>	<i>aká!</i>	<i>ybakə</i>	<i>sləra.</i>
2	1	3 1	2	2	2 1	3 3	3 3	3 3
~AR	want	RE	1s	FS	INDEF	NEG	do	work
I want that someone doesn't work.								

4. Verbal extensions

Jarvis (1989a) divides all verbal extensions into two categories—directionals and object markers. It seems best, however, to make a third category for the reflexive/reciprocal extension *-v-* since it behaves differently than other object markers. The three categories of verbal extensions are discussed in §§4.1–4.3, respectively.

4.1. Directionals. All verbal directionals are marked tonally in one of three ways. Some are marked with an inherent H, some with a floating H, and some with a floating copy tone. Those marked with a floating H seem to be restricted to the labialized affixes plus *y-tsa* ‘toward’ and *-ara* ‘reflexive.’ The copy tone copies the basic underlying tone of a verb onto a following reduplicated form of the verb. The extensions cancel the effect of the floating H in class 2 (LL H). The extensions with an inherent H cancel the effect of the floating H following the aorist, but the floating copy tone allows for the floating H of the aorist to associate onto the following word. The following list of extensions (slightly modified) is taken from Jarvis 1989b:2.

(28) Verbal extensions of Podoko

Inherent H	Floating H	Floating copy tone
-əlá 'entire'	(')(-əl)-u	'up'
-adá 'partial'	-(a/ə)kwa	'into'
-ədá 'out (INTR)'	-yatsa	'toward'
-ədá (unknown)	-ara	'reflexive'
		-əla 'entire, down'
		-ada 'partial, down'
		-aha 'down (INTR)'
		-asa 'under'
		-arə 'on'
		-əda 'toward eye'

Since perfect and imperfective constructions do not usually take verbal extensions, only aorist and various perfective forms are presented. It should be noted that the tone of the first vowel of an extension is the property of the verb and not the extension. As seen from these examples, whenever a verbal extension is added, some neutralization of tone classes occurs and the four classes collapse into two—those that contain an inherent H (classes 3 and 4) and those that don't (classes 1 and 2). The manifestation of H in classes 3 and 4 is totally predictable according to the consonant type of the first syllable and the type of extension added, as illustrated in (29)–(34).

(29) Class 1 (LL), *ndara* 'to build, make', with extensions -əlá 'entire', -əlu H 'up', and -əla C 'down'.

PRFV PST	A ndar-əlá	ndara	nda.	'Someone made it.'
	A yndar-əlu	ndára	nda.	'Someone built it up.'
	A ndar-əla	ndara	nda.	'Someone built it.'
PRFV PRES	! A ndar-əlá	ndara	nda.	'May someone make it.'
	! A yndar-əlu	ndára	nda.	'May someone build it up.'
	! A ndar-əla	ndara	nda.	'May someone build it.'
PRFV IMPV	Ndar-əlá	ndara.		'Make it!'
	Ndar-əlu	yndára.		'Build it up.'
	Ndar-əla	ndara.		'Build it!'
AORIST	Ndar-əlá		nda.	'Someone made it.'
	Ndar-əlu		nda.	'Someone built it up.'
	Ndar-əla		nda.	'Someone built it.'

- (30) Class 2 (LL H), *baka* 'to do' with extensions -*əlá* 'entire', -*akwa* H 'into', and -*əla* C 'down'.

PRFV PST	<i>A baka-əlá</i>	<i>bákə nda.</i>	'Someone did it.'
	<i>A baka-akwa</i>	<i>bákə nda.</i>	'Someone did and brought it in.'
	<i>A baka-əla</i>	<i>bákə nda.</i>	'Someone did and brought it down.'
PRFV PRES	<i>! A baka-əlá</i>	<i>bákə nda.</i>	'May someone do it.'
	<i>! A baka-akwa</i>	<i>bákə nda.</i>	'May someone do and bring it in.'
	<i>! A baka-əla</i>	<i>bákə nda.</i>	'May someone do and bring it down.'
PRFV IMPV	<i>Bak-əlá</i>	<i>bákə.</i>	'Do it!'
	<i>Bak-akwa</i>	<i>bákə.</i>	'Do and bring it in!'
	<i>Bak-əla</i>	<i>bákə.</i>	'Do and bring it down!'
AORIST	<i>Bak-əlá</i>	<i>nda.</i>	'Someone did it.'
	<i>Bak-akwa</i>	<i>ndá.</i>	'Someone did and brought it in.'
	<i>Bak-əla</i>	<i>ndá.</i>	'Someone did and brought it down.'

- (31) Class 3a (HL), *gədə* 'to remain' with extensions -*ədá* 'partial', -*u* H 'up', and -*aha* C 'down'.

PRFV PST	<i>A géd-ədá</i>	<i>gédə nda.</i>	'Someone remained.'
	<i>A géd-u</i>	<i>gédə nda.</i>	'Someone remained up (there.)'
	<i>A géd-aha</i>	<i>gédə nda.</i>	'Someone remained.'
PRFV PRES	<i>! A géd-ədá</i>	<i>gédə nda.</i>	'May someone remain.'
	<i>! A géd-u</i>	<i>gédə nda.</i>	'May someone remain up (there.)'
	<i>! A géd-aha</i>	<i>gédə nda.</i>	'May someone remain.'
PRFV IMPV	<i>Géd-ədá</i>	<i>gédə.</i>	'Remain!'
	<i>Géd-u</i>	<i>gédə.</i>	'Remain up (there)!'
	<i>Géd-aha</i>	<i>gédə.</i>	'Remain!'
AORIST	<i>Géd-ədá</i>	<i>nda</i>	'Someone remained.'
	<i>Géd-u</i>	<i>ndá.</i>	'Someone remained up (there).'
	<i>Géd-aha</i>	<i>ndá.</i>	'Someone remained.'

- (32) Class 3b (LH), *dəga* 'to pound' with extensions -*əlá* 'entire', -*akwa* H 'into', and -*əla* C 'down'.

PRFV PST	<i>A dəg-əlá</i>	<i>dəgə nda.</i>	'Someone pounded it all.'
	<i>A dəg-əkwa</i>	<i>dəgə nda.</i>	'Someone pounded and brought it in.'
	<i>A dəg-əla</i>	<i>dəgə nda.</i>	'Someone pounded and brought it down.'
PRFV PRES	<i>! A dəg-əlá</i>	<i>dəgə nda.</i>	'May someone pound it all.'
	<i>! A dəg-əkwa</i>	<i>dəgə nda.</i>	'May someone pound and bring it in.'
	<i>! A dəg-əla</i>	<i>dəgə nda.</i>	'May someone pound and bring it down.'
PRFV IMPV	<i>Dəg-əlá</i>	<i>dəgə.</i>	'Pound it all!'
	<i>Dəg-əkwa</i>	<i>dəgə.</i>	'Pound it and bring it in!'
	<i>Dəg-əla</i>	<i>dəgə.</i>	'Pound it and bring it down!'
AORIST	<i>Dəg-əlá</i>	<i>nda.</i>	'Someone pounded it all.'
	<i>Dəg-əkwa</i>	<i>ndá.</i>	'Someone pounded and brought it in.'
	<i>Dəg-əla</i>	<i>ndá.</i>	'Someone pounded and brought it down.'

- (33) Class 4a (HL ⌚), *ndəha* ‘to fatten’ with extensions *-əlá* ‘entire’, and *-aha* ‘down’ (no examples of an extension with ɿ).

PRFV PST	<i>A ndəh-əlá</i>	<i>ndəha</i>	<i>nda.</i>	‘Someone fattened it.’
	<i>A ndəh-aha</i>	<i>ndəha</i>	<i>nda.</i>	‘Someone became obese.’
PRFV PRES	<i>/ A ndəh-əlá</i>	<i>ndəha</i>	<i>nda.</i>	‘May someone fatten it?’
	<i>/ A ndəh-aha</i>	<i>ndəha</i>	<i>nda.</i>	‘May someone become obese?’
PRFV IMPV	<i>Ndəh-əlá</i>	<i>ndəha.</i>		‘Fatten it!’
	<i>Ndəh-aha</i>	<i>ndəha.</i>		‘Become obese!’
AORIST	<i>Ndəh-əlá</i>		<i>nda.</i>	‘Someone fattened it.’
	<i>Ndəh-aha</i>		<i>ndá.</i>	‘Someone became obese.’

- (34) Class 4b (LH ⌚), *usalá* ‘to choose, to look for’ with extensions *-adá* ‘partial’, and *-akwa* ɿ ‘into’.

PRFV PST	<i>A usal-ádá</i>	<i>usalá</i>	<i>nda.</i>	‘Someone chose it.’
	<i>A usal-ákwa</i>	<i>úsala</i>	<i>nda.</i>	‘Someone chose to enter in.’
	<i>A usal-áda</i>	<i>usalá</i>	<i>nda.</i>	‘Someone looked for it downwards.’
PRFV PRES	<i>/ A usal-adá</i>	<i>usalá</i>	<i>nda.</i>	‘May someone choose it?’
	<i>/ A usal-akwa</i>	<i>úsala</i>	<i>nda.</i>	‘May someone choose to enter in?’
	<i>/ A usal-ada</i>	<i>usalá</i>	<i>nda.</i>	‘May someone look for it downwards?’
PRFV IMPV	<i>Usal-adá</i>	<i>usalá!</i>		‘Choose it!’
	<i>Usal-akwa</i>	<i>úsala!</i>		‘Choose to enter in!’
	<i>Usal-ada</i>	<i>usalá!</i>		‘Look for it downwards!’
AORIST	<i>Usal-adá</i>		<i>nda.</i>	‘Someone chose it.’
	<i>Usal-akwa</i>		<i>ndá.</i>	‘Someone chose to enter in.’
	<i>Usal-ada</i>		<i>ndá.</i>	‘Someone looked for it downwards.’

4.2. Object markers. The object markers are presented in (35).

(35)	1s	<i>-i(-)</i>	1x	<i>-n-</i>
	2s	<i>-k-</i>	1i	<i>-m-</i>
	3s	<i>(y) Ø/-l-</i>	2p	<i>-kw-</i>
			3p	<i>-t-</i>

The vowel preceding the object marker (other than first-person singular *-i-*) is *a* if the verb is not palatalized, and *ə* if the verb is palatalized.

The vowel following the object marker can be either *a* or *ə*, the tone of which is the property of the object marker. Second-person singular *-k-* is the only person where the quality of the vowel following the marker is influenced by palatalization; the vowel is *a* if the verb is not palatalized, and *ə* if palatalized.

The tone of first-person singular (*-i-*) is complex and is explained below with examples.

If the object marker occurs with a directional, the tone of the object marker is always L, no matter what the tone of the directional is. A class 1 verb is shown in (36) with the direct object marker and a high tone extension. Note that the first-person object marker palatalizes the whole verb. The tone on the affix is not affected by that of the extension; the affix always carries L.

(36) Object markers occurring with a H tone extension.

Class 1 (LL), *ndara* ‘build, create’ (PRFV PST)

<i>A yndar-i-dá yndara Z̥ata.</i>	‘God created me.’
<i>A ndara-ka-dá ndara Z̥ata.</i>	‘God created you.’
<i>A ndarəla ndara Z̥ata.</i> [Ø marker]	‘God created him.’
<i>A ndara-na-dá ndara Z̥ata.</i>	‘God created us (ex).’
<i>A ndara-ma-dá ndara Z̥ata.</i>	‘God created us (in).’
<i>A ndara-kwa-dá ndara Z̥ata.</i>	‘God created you (pl).’
<i>A ndara-ta-dá ndara Z̥ata.</i>	‘God created them.’

If a verb has an inherent H (classes 3 and 4), then the object pronoun is L. As with the directionals, the tone just before the affix is the property of the verb. Paradigms in (37) and (38) show the object marker with classes 3a and 3b, without any other extensions.

(37) Object markers on verbs with HL.

Class 3a (HL), *zláha* ‘accept, receive’ (PRFV PST)

<i>A yzláh-i yzláha nda.</i>	‘Someone accepted me.’
<i>A zláha-ka zláha nda.</i>	‘Someone accepted you.’
<i>A zláha-lá zláha nda.</i>	‘Someone accepted him.’
<i>A zláha-na zláha nda.</i>	‘Someone accepted us (ex).’
<i>A zláha-ma zláha nda.</i>	‘Someone accepted us (in).’
<i>A zláha-kwá zláha nda.</i>	‘Someone accepted you (pl).’
<i>A zláha-tá zláha nda.</i>	‘Someone accepted them.’

(38) Object markers on verbs with LH.

Class 3b (LH), *dágá* ‘pound, beat’ (PRFV PST)

<i>A ydág-iya ydágá nda.</i>	‘Someone beat me.’
<i>A dágá-ka dágá nda.</i>	‘Someone beat you.’
<i>A ydágá-la ydágá nda.</i>	‘Someone beat him.’
<i>A dágá-na dágá nda.</i>	‘Someone beat us (ex).’
<i>A dágá-ma dágá nda.</i>	‘Someone beat us (in).’
<i>A dágá-kwá dágá nda.</i>	‘Someone beat you (pl).’
<i>A dágá-tá dágá nda.</i>	‘Someone beat them.’

As seen in the paradigms (37) and (38), if a verb contains an inherent H, the tone following the object marker is L. The object marker works as a normal L affix causing the H to show up on the second verb, except for the first-person singular marked -i- (see (40)).

The object marker carries a H if the verb is a class 1 verb (LL), and if the vowel following the object marker is a (usually a direct object). The following paradigm shows the same verb, first with the object marker taking a, and secondly with ε. With this particular verb, a is formally a direct object and ε an indirect object, but semantically the meaning is the same. The object marker takes a H with a class 1 (LL) verb if the final vowel is a, but does not if the final vowel is ε.

(39) Class 1 (LL) verb with object marker taking a

Class 1 (LL), təha 'hit, beat' (PRFV PST)

A ytəh-iyá ytəhə nda.	'Someone hit me.'
A təha-ká təhə nda.	'Someone hit you.'
A ytəhəla ytəhə nda. [Ø marker]	'Someone hit him.'
A təha-ná təhə nda.	'Someone hit us (ex.)'
A təha-má təhə nda.	'Someone hit us (in.)'
A təha-kwá təhə nda.	'Someone hit you (pl.)'
A təha-tá təhə nda.	'Someone hit them.'

(40) Class 1 (LL) verb with object marker taking ε

Class 1 (LL), təha 'hit, beat' (PRFV PST)

A ytəh-i ytəhə nda.	'Someone hit me.'
A təha-ka təhə nda.	'Someone hit you.'
A təha təhə nda. [Ø marker]	'Someone hit him.'
A təha-na təhə nda.	'Someone hit us (ex.)'
A təha-ma təhə nda.	'Someone hit us (in.)'
A təha-kwə təhə nda.	'Someone hit you (pl.)'
A təha-tə təhə nda.	'Someone hit them.'

First-person singular -i- has a floating tone that associates onto the second verb if it is not followed by a and if the verb does not have an inherent H. Thus a H following -i- occurs on the second verb in classes 1 and 2 (LL and LL HH as in (40)), but does not occur in classes 3 and 4, as in the HL and LH paradigms in (37) and (38).

For class 2 verbs (LL H), the floating H associates onto the object marker if the verb otherwise has no affix (except for the first-person object marker, as noted above). (41) shows the tonal behavior of the object marker with a class 2 verb.

(41) Object markers in a class 2 verb

Class 2 (LL HH), *tala* 'touch' (PRFV PST)

<i>A ytal-i ytála nda.</i>	'Someone touched me.'
<i>A tala-ká tala nda.</i>	'Someone touched you.'
<i>A tala-ló tala nda.</i>	'Someone touched him.'
<i>A tala-ná tala nda.</i>	'Someone touched us (ex).'
<i>A tala-má tala nda.</i>	'Someone touched us (in).'
<i>A tala-kwá tala nda.</i>	'Someone touched you (pl).'
<i>A tala-tá tala nda.</i>	'Someone touched them.'

Before leaving the discussion of object markers, consider briefly the tonal behavior of benefactives. The mark of the benefactive is palatalization plus floating H if the vowel of the object marker is a. This floating H associates onto the first syllable of the second verb. There is no floating H, however, if the vowel of the object marker is a. The verb then behaves as if it has a normal L affix. This is illustrated with two class 3b verbs (LH), the first of which takes a after the object marker, the second taking a. The quality of the vowel following the object marker in the benefactive is very important to the tone; the a benefactive has a floating H that associates onto the first syllable of the second verb, while a works like any other L affix.

(42) Benefactive with a vowel

Class 3b (LH), *hwada* 'stir up, mix' (PRFV PST)

<i>A yhwad-i yhwáda ndi yewá páhwa.</i>	'Someone stirred the flour water for me.'
<i>A yhwadá-kə yhwáda ndi yewá páhwa.</i>	'Someone stirred the flour water for you.'
<i>A yhwadá-la yhwáda ndi yewá páhwa.</i>	'Someone stirred the flour water for him.'
<i>A yhwadá-na yhwáda ndi yewá páhwa.</i>	'Someone stirred the flour water for us (ex).'
<i>A yhwadá-ma yhwáda ndi yewá páhwa.</i>	'Someone stirred the flour water for us (in).'
<i>A yhwadá-kwá yhwáda ndi yewá páhwa.</i>	'Someone stirred the flour water for you (pl).'
<i>A yhwadá-ta yhwáda ndi yewá páhwa.</i>	'Someone stirred the flour water for them.'

(43) Benefactive with *a* vowel

Class 3b (LH), *tsaslá* 'plant in dry ground' (PRFV PST)

- | | |
|--|---|
| <i>A ytsaslá-iyá ytsaslá ndi hiyá.</i> | 'Someone planted grain in the dry ground for me.' |
| <i>A ytsaslá-ka ytsaslá ndi hiyá.</i> | 'Someone planted grain in the dry ground for you.' |
| <i>A ytsaslá-la ytsaslá ndi hiyá.</i> | 'Someone planted grain in the dry ground for him.' |
| <i>A ytsaslá-na ytsaslá ndi hiyá.</i> | 'Someone planted grain in the dry ground for us (ex).' |
| <i>A ytsaslá-ma ytsaslá ndi hiyá.</i> | 'Someone planted grain in the dry ground for us (in).' |
| <i>A ytsaslá-kwa ytsaslá ndi hiyá.</i> | 'Someone planted grain in the dry ground for you (pl).' |
| <i>A ytsaslá-ta ytsaslá ndi hiyá.</i> | 'Someone planted grain in the dry ground for them.' |

The *a* in the benefactive also blocks the floating H of class 2 verbs. (44) is an example of a class 2 verb (LL H_H), with a benefactive that takes *a*.

(44) Benefactive with *a* vowel and a class 2 verb

Class 2 (LL H_H), *ndzaga* 'place an object upright (pl)' (PRFV PST)

- | | |
|---------------------------------------|---|
| <i>A yndzagə-ta yndzagə ndi yəwá.</i> | 'Someone placed the water (containers) for them.' |
|---------------------------------------|---|

4.3. The reflexive/reciprocal marker. The affix used in Podoko to mark reflexivity or reciprocity is *-v-*. The vowel before the affix is *a* when the affix immediately follows an unpalatalized verb root; otherwise it is *ə*. The vowel after the affix is either *ə* or *a*, depending upon the verb. There seems to be no way of predicting which final vowel a verb will take. As with the object markers, the reflexive/reciprocal marker (REFL) always takes L when in combination with other affixes. (45) shows the reflexive/reciprocal marker in combination with two other affixes.

- | | |
|---|--|
| (45) <i>A gwats-al-əv-ala gwatsə nda.</i> | |
| ~AR find-3s-REFL-entire RE INDEF | |
| Someone found him. | |

The reflexive/reciprocal marker takes a L when in combination with other affixes. Otherwise this affix works tonally very much like the middle voice in that a H must be obligatorily present.¹¹ In class 1 where there is no inherent H, a H is present on the vowel following the affix. In class two (LL H_H), the floating H associates onto the vowel of the affix. All the other tonal classes have an inherent H, therefore the vowel of the reflexive/reciprocal marker is L.

- (46) Class 1 (LL), *təha* 'hit, beat'

A təh-avá təhə nda.
 ~AR hit-REFL RE INDEF
 One hit oneself.

- (47) Class 2 (LL H_H), *baka* 'do, make, create'

A bak-avá bakə sariyá.
 ~AR do-REFL RE judgment
 The judgment happened.

¹¹There are two verbs that have two tonal patterns for the -avə affix; *baka* 'do, happen, make' and *hama* 'pile up, group'. Both verbs are class 2 verbs (LL H) and one would expect the -avə affix to have a H. This form does exist.

- (64) *A bak-avá bakə sariyá.*
 ~AR do-REFL RE judgment
 The judgment happened.

- (65) *A ham-avá hama nda.*
 ~AR group-REFL RE INDEF
 People grouped together.

However, these two verbs carry another meaning, and in order to distinguish this meaning, the -avə affix does not carry a H.

- (66) *A bak-avə bakə ndi muzá.*
 ~AR do-REFL RE INDEF blood
 Someone did blood to himself (one cut himself).

- (67) *A ham-avə hama ndi paná.*
 ~AR group-REFL RE INDEF stalk
 Someone grouped together the stalks.

Thus, it seems that when a verb has two meanings for the -avə affix, the intransitive (or middle) form takes the H while the transitive form takes L.

- (48) Class 3a (HL), *dzaba* ‘sprinkle’

A dzáb-avə dzábə ndi mala.
 ~AR sprinkle-REFL RE INDEF oil
 Someone sprinkled himself with oil.

- (49) Class 3b (LH), *məta* ‘tear, rip’

A mət-ávə mətə nda.
 ~AR rip-REFL RE INDEF
 Someone ripped (cut) himself.

5. Tone on plural verbs

Anderson and Swackhamer (1981) have shown that consonants influence tone in Podoko. But what about vowels? Schuh says that the tone class of verbs in Ngizim “is almost entirely predictable from the vowel of the first syllable: if this vowel is *a*, the verb will have a high tone; if it is a high vowel, the verb will have a low tone” (Schuh 1971:34). Newman (1975) argues that it is wrong to postulate a correlation between tone and vowel height in Hausa plurals. In Podoko plurals there is a correlation between vowels and tone. Podoko, as in some other Chadic languages (Frajzyngier 1977:51), manifests a vowel change in the plural form of verbs that have *a* in the first syllable (Jarvis 1986). Thus *bəla* ‘increase, multiply’ becomes *bala* in the plural, and *fətsa* ‘escape’, becomes *fatsa*. An -aw suffix can also be added (Jarvis 1986). If a singular verb already contains *a* in the first syllable, there is no tone change from the singular to the plural.

- (50) *A ndávə ndavə ndi dafá.*

~AR ask^{^s} RE INDEF fufu
 Someone asked for fufu.

- (51) *A ndávawa ndavawə ndi dafá.*

~AR ask^{^p} RE INDEF fufu
 People asked for fufu.

From these two examples, we see that a c₁c₂v construction maintains the same tonal pattern from singular to plural. If, however, the verb contains an inherent H and has either the schema c₁c₂v or c₁c₂c₃v, then the H becomes a floating H in the plural, as in (52)–(57). This floating H associates onto the first syllable of the second verb for no observable reason.

- (52) Floating tone production in plural verbs

sg	\Rightarrow	pl
cácv	\Rightarrow	cacv ^H
cacv	\Rightarrow	cacv ^H

- (53) *dágá* (sg); *daga* ^H (pl) 'pound'

A dágá dágə ndi yngwába.
 ~AR pound^s RE INDEF okra
 Someone pounded the okra.

- (54) *A daga dágə ndi yngwába.*

~AR pound^p RE INDEF okra
 Many people pounded the okra.

- (55) *zlóngá* (sg); *zlanga* ^H, *zlangawa* ^H (pl) 'put horizontally'

A zlóngá zlóngə ndi nafá.
 ~AR place^s RE INDEF wood
 Someone was able to place the pole horizontally.

- (56) *A zlanga zlángə ndi nafá.*

~AR place^p RE INDEF wood
 Someone was able to place the poles horizontally.

- (57) *A zlangawa zlángawə ndi nafá.*

~AR place^H RE INDEF wood
 Someone placed the poles horizontally.

6. Historical hypothesis

It is difficult to say what the historical underlying forms of the verbs were. The Podoko language seems to avoid a H H sequence in the surface structure. Having H at the beginning of an utterance is also avoided. Besides the unmarked imperfective imperatives of classes 3a and 4a, there are only six morphemes (with mostly modal meanings) which are realized with an utterance-initial H.

(58) Utterance-initial H morphemes

<i>bí</i>	'perhaps'
<i>dá</i>	'on'
<i>ndá</i>	(plural)
<i>má</i>	'even'
<i>mú</i>	'may'
<i>sáyá</i>	'must' (borrowed from Fulani)

The underlying forms may be posited as LL, LH, HL, and HH, but with another L added at the beginning of all verbs to prevent a H from appearing syllable-initial on the surface. This added L spreads everything to the right one syllable, causing the last tone to float. If the floating tone is L, it disappears while a floating H remains, as indicated in (59).

(59) Isolation forms of verbs

	Historical	+ L	Surface
Verb class 1	LL	→ LLL → LL	
Verb class 2	LH	→ LLH → LL H	
Verb class 3	HL	→ LHL → LH	
Verb class 4	HH	→ LHH → LH H	

The H of Class 4 verbs has become C in present-day surface forms. The placement of the H in classes 3 and 4 is dependent upon the consonant type of the first syllable. If the first consonant is a depressor consonant, the H is placed on that syllable. If the first consonant is not a depressor consonant, the H is displaced onto the second or one of the subsequent syllables. While the preceding historical hypothesis has the advantage of seeming fairly simple and straightforward, comparative evidence with other Chadic languages may reveal a more complicated explanation for present-day forms in Podoko.

7. Residue

There are a few verbs such as *kasa* 'to take, carry, catch, seize' which seem to have two different tonal patterns. The meaning 'to take, carry' never occurs without an affix, and the tonal pattern is that of a Class 1 (LL) or Class 2 (LL H) verb.

- (60) *A kəs-əlā kəsə nda.*
 ~AR take-out RE INDEF
 Someone took it out.

- (61) *A kəs-əla kəsə nda.*
 ~AR carry-down RE INDEF
 Someone carried it down.

The meaning ‘to catch, seize’ does occur without an affix, and the tone pattern is that of a Class 3b (LH) verb.

- (62) *A kəsá kəsə nda.*
 ~AR seize RE INDEF
 Someone seized it.

These were probably two verbs historically, ‘to take, carry’ having a LL pattern, and ‘to catch, seize’ having a LH pattern. Lamang (Wolff 1983:100) has two morphemes, *kla* ‘to take’ and *ksa* ‘to catch, seize.’ Even though most verbs in Podoko have a very large semantic field due to the extensions, it seems best to treat *kəsa* as two separate morphemes in two different lexical tone classes.

- (63) *kəsa* (LL) ‘to take, carry’
kəsa (LH) ‘to catch, seize’

8. Conclusion

In this paper, the Podoko tone system has been examined in detail with special focus on tone changes due to verbal marking. At first glance, it seems to be a three-tone system, but once the distribution of these tones in various environments is studied, it is found to be a two-tone system with the additional feature of downstep. In contrast to many of the languages of the world, downstep in Podoko affects only L. Also, it is unusual that the tone register is reset when going from a downstepped L to H instead of waiting for a pause (as in many other downstep languages). When these two phenomena are considered together, one might be tempted to consider the lowering as just a lowered tone instead of a lowered register. This is not the case, however, because all Ls after a lowered L occur on the same lowered level. The phenomenon is indeed the lowering of an entire register which we call downstep, even though the lowering only lasts until the next H.

In passing, various clause- and sentence-final tonal variants (often referred to as intonation) were noted. Of more importance to the purpose of this paper, the interaction of consonants and tone in Podoko led to the positing of various verb classes. It was only after positing underlying tonal patterns for each of these classes (including floating high and floating copy tones) that most occurrences of clause-medial downstep could be predicted on the basis of the presence of depressor consonants. The remaining cases of clause-medial downstep were found to be limited to the lexical form of a restricted set of grammatical words. A possible historical hypothesis is presented for how the present underlying forms of Podoko verbs might have evolved from earlier patterns.

This paper also looked into the grammatical downstep feature which occurs at the beginning of present tense clauses. The presence of the lowered register was shown by comparing two spectrographs. The only difference between the two was the presence or absence of the lowering indicating present as against past tense.

Finally, the paper included data on the sixteen possible constructions in independent clauses in each of the six tone subclasses, and the three types of verbal extensions with the perfective and aorist constructions. This paper thus provides the long-awaited complement to Anderson and Swackhamer 1981 on Podoko nouns.

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Appendix

Tone Class 1		
<i>ybəbara</i> 'harden'	<i>pəsa</i> 'pour (something powdery or powderable) for him, give him'	<i>yfəta</i> ¹ 'dry (sprouted grain for beer)'
<i>bəla</i> ¹ 'increase'	<i>yəpasa</i> 'drizzle, sprinkle'	<i>fəta</i> ² 'shave'
<i>bəla</i> ² 'relate'	<i>pəhwa</i> 'break off (a limb)'	<i>yfəta</i> ² 'remove (something that is stuck on)'
<i>bəla</i> ³ 'light'	<i>pəla</i> ¹ 'untie, release'	<i>fətsa</i> 'escape'
<i>bəla</i> 'catch with glue'	<i>pəla</i> ² 'pay back'	<i>fa</i> 'place, put (sg. object)'
<i>bəwa</i> 'call, escort'	<i>pəla</i> ³ 'roof, thatch'	<i>fusla</i> 'remove'
<i>bəza</i> 'have a miscarriage'	<i>pərsla</i> 'dislocate (a limb)'	<i>tədama</i> 'calm'
<i>dəfətəla</i> 'fall'	<i>pa</i> 'put, take, give, close (wound)'	<i>təfa</i> ¹ 'give, get (fire)'
<i>da</i> 'sprout (new leaves)'	<i>pahwatsa</i> 'break up'	<i>təfa</i> ² 'spit'
<i>pəta</i> 'overdo something (unnecessarily, unwisely)'	<i>pasta</i> 'peel off, crack off'	<i>taha</i> ¹ 'hit'
<i>yəpəta</i> 'miss, fail to do'	<i>pava</i> 'winnow'	<i>taha</i> ² 'ripen'
<i>pətsa</i> 'change, explain, translate'	<i>fəta</i> ¹ 'blow (greeting)'	<i>tərda</i> 'sadden, anger'
		<i>təra</i> 'be unable'

<i>təwa</i> 'measure (with part of the body)'	<i>y'səba</i> 'put in (something pointed)'	<i>wiya</i> 'walk, wander'
<i>tava</i> 'last, stay a while'	<i>səda</i> 'put on, take off (e.g., clothes)'	<i>'y'mətsa</i> 'forget'
<i>tula</i> 'perform a rite'	<i>səkala</i> 'sing'	<i>mərsa</i> 'blacken'
<i>tsəba</i> 'greet respectfully'	<i>səkwa</i> 'buy'	<i>'y'maza</i> 'come upon, find'
<i>'y'tsəba</i> 'plant, set upright'	<i>'y'sasara</i> 'harden'	<i>'y'matsa</i> 'extinguish'
<i>'y'tsəda</i> 'excrete'	<i>'y'səna</i> 'get used to'	<i>mala</i> 'become'
<i>tsəkəra</i> 'warm oneself'	<i>sa</i> 'come'	<i>'y'na</i> 'appear, be invented, come into circulation'
<i>tsəka</i> 'revive'	<i>sapa</i> 'pound of outer shell'	<i>naka</i> 'look'
<i>'y'tsəka</i> 'remove, place upon'	<i>saha</i> 'provoke'	<i>'y'bəla</i> <i>y'bola</i> 'be difficult'
<i>tsəkwa¹</i> 'alight'	<i>hada</i> 'bury'	<i>bəra</i> 'drive'
<i>tsəkwa²</i> 'dress, undress'	<i>hərda</i> 'cut off body part (ear, nose)'	<i>bəra</i> 'repeat, redo'
<i>tsəkwa³</i> 'begin'	<i>həra</i> 'skin'	<i>ba</i> 'weave'
<i>tsaha¹</i> 'miss'	<i>həna</i> 'lie down, spend the night, spend time'	<i>baka</i> 'bend over'
<i>tsaha²</i> 'dig'	<i>ha¹</i> 'be born, give birth'	<i>bahwa</i> 'bark'
<i>tsəhwəra</i> 'sit on heels'	<i>ha²</i> 'hem, embroider'	<i>buzla</i> 'take a mouthful'
<i>'y'tsəhwəra</i> 'gather several small quantities'	<i>hatsakwa</i> 'get ready to leave'	<i>dəħħada</i> 'chew cud'
<i>tsəhwada</i> 'exceed limits'	<i>halə¹</i> 'avoid'	<i>dərda</i> 'become paralyzed'
<i>tsəhwala¹</i> 'clean leaves'	<i>halə²</i> 'glean'	<i>dərə</i> 'destroy'
<i>tsəhwala²</i> 'rinse'	<i>hina</i> 'scare'	<i>dədara</i> 'pack down'
<i>'y'tsəra</i> 'slip away'	<i>hwabə</i> 'put on the stomach, upside down'	<i>'y'dagwana</i> 'dirty'
<i>'y'tsəwa</i> 'drink last drop, drain'	<i>hwapa</i> 'be eaten by insects'	<i>'y'dənġa</i> 'place firmly'
<i>'y'tsəngwa</i> 'descend'	<i>hwasa</i> 'pour liquid'	<i>da</i> 'go'
<i>tsa</i> 'take, give a portion'	<i>hwəla</i> 'cry, scream'	<i>dara</i> 'hammer in, embed'
<i>'y'tsa</i> 'come (here)'	<i>sləha</i> 'explode'	<i>'y'danga</i> 'exert'
<i>tsaba</i> 'eat (soup or porridge)'	<i>sləda</i> 'leave one path to follow another, mislead'	<i>dzəha</i> 'be sturdy'
<i>tsaka¹</i> 'speak out from heart'	<i>slərtə</i> 'get stuck'	<i>dza</i> 'hurt'
<i>tsaka²</i> 'stop'	<i>slərnda</i> 'scorch'	<i>'y'dza</i> 'exceed'
<i>tsakwa</i> 'become informed'	<i>sla¹</i> 'suffice'	<i>dzaka</i> 'teach, learn'
<i>'y'tsakwazla</i> 'clean (e.g. nails, teeth, ears)'	<i>sla²</i> 'cut'	<i>dzawa</i> 'lose, forfeit'
<i>tsaha</i> 'take, remove in bits (something that is stuck)'	<i>sla³</i> 'smooth, spread, rub'	<i>gəsla</i> 'swell'
<i>tsama</i> 'know'	<i>sla⁴</i> 'happen'	<i>ga</i> 'do, happen'
<i>tsisla</i> 'break off small particles'	<i>sləha</i> 'growl, scold'	<i>gaha</i> 'incite'
<i>kəðafatala</i> 'fall'	<i>slala</i> 'cut off branches'	<i>gala</i> 'praise'
<i>kasa</i> 'carry, take (sg. object)'	<i>ləba¹</i> 'soak'	<i>gara</i> 'equal, resemble'
<i>kəslə</i> 'swell'	<i>ləba²</i> 'become fat gradually'	<i>giya</i> 'bother'
<i>'y'kəslə</i> 'calm'	<i>ləfa</i> 'blind'	<i>gwəla</i> 'reduce'
<i>kala¹</i> 'destroy (in battle)'	<i>la</i> 'accompany, guide'	<i>gwərda</i> 'twist'
<i>kala²</i> 'move house'	<i>rəwa</i> 'die (pl. subject), tire'	<i>gwatsa</i> 'obtain, find'
<i>kala³</i> '(i) be broken'	<i>rəva</i> 'rot'	<i>gwasa</i> 'reach'
<i>ka</i> 'lower'	<i>rzala</i> 'be familiar with'	<i>vala¹</i> 'give'
<i>kata¹</i> 'sift (flour)'	<i>rənda¹</i> 'slough off'	<i>vala²</i> 'sell'
<i>kata²</i> 'protect'	<i>rənda²</i> 'eat a lot'	<i>va¹</i> 'give'
<i>katsa</i> 'stop, stand'	<i>yaba</i> 'flow in small quantity'	<i>va²</i> 'pass the year'
<i>katsaba</i> 'gather something wet or soft'	<i>yaha</i> 'choose'	<i>vaka</i> 'pass the day'
<i>kasa</i> 'sift (sand)'	<i>wəla¹</i> 'accomplish, finish'	<i>vara</i> 'save, buy back'
<i>kala</i> 'settle (price), utter (lie)'	<i>wəla²</i> 'take by surprise'	<i>viya</i> 'delay'
<i>'y'kala</i> 'compare, confuse'	<i>wəla³</i> 'be devoted'	<i>vusa</i> 'erase, cross out'
<i>kwaħa</i> 'tan'	<i>wəra</i> 'return, bring back'	<i>zala</i> 'chat'
<i>kwəħa</i> 'heat, boil (a liquid)'	<i>wakaka</i> 'enlighten'	<i>zəvəra</i> 'be light-headed'
<i>'y'kwətsa</i> 'cut into pieces'	<i>'y'wasa</i> 'scatter, disperse, disintegrate'	<i>za</i> 'disappear, lose, destroy'
<i>kwəra</i> 'borrow, lend, predict'	<i>wara</i> 'lead (animals)'	<i>'y'za</i> 'move'
<i>'y'kwada</i> 'get ready'		<i>zaha¹</i> 'provoke'

<i>zla¹</i> 'rejoice'	<i>kəda'</i> 'kill'	<i>básla</i> 'castrate'
<i>zla²</i> 'finish'	<i>kwama'</i> 'desire, miss'	<i>báza</i> 'unearth'
<i>zlabá</i> 'interlock'	<i>y'kwatsá'</i> 'tear into pieces'	<i>búta</i> 'fan'
<i>zlahá</i> 'take out (honey)'	<i>kwala'</i> 'refuse'	<i>dáka</i> 'wall together'
<i>zlayá</i> 'be just, customary'	<i>kwara'</i> 'rule, organize'	<i>dáya</i> 'know, recognize'
<i>mbárza</i> 'slip from'	<i>sa'</i> 'drink'	<i>dágá</i> 'enrich'
<i>mbará</i> 'have fear (of, for)'	<i>sula'</i> 'grill, roast, fry (in a receptacle)'	<i>dángwa</i> 'make blurred, dim'
<i>mbala¹</i> 'sharpen'	<i>haya'</i> 'thank, be satisfied with'	<i>dádakwa</i> 'break off heads of grain with short stalk'
<i>mbala²</i> 'spread abroad'	<i>hama'</i> 'pile up, group'	<i>y'dáfa</i> 'curse'
<i>mbara</i> 'go (pl.)'	<i>hadakwa'</i> 'dig a hollow'	<i>dágara</i> 'repair'
<i>mbuta</i> 'wrap up'	<i>hwəmbará</i> 'embrace'	<i>y'dágwawa</i> 'observe'
<i>ndəla¹</i> 'cut'	<i>hwandza'</i> 'gather up hurriedly'	<i>dángwasla</i> 'shake (a person)'
<i>ndəla²</i> 'jump, fly'	<i>slara'</i> 'work, cultivate'	<i>dúfa</i> 'blunt'
<i>ndərda</i> 'pilfer'	<i>slada'</i> 'sweep'	<i>dzárva</i> 'flow, pour (from one ves- sel to another)'
<i>ndaza</i> 'cook well'	<i>slafa'</i> 'pray'	<i>dzárhwa</i> 'pound (in the mortar)'
<i>nda</i> 'be'	<i>y'slahwa'</i> 'tie up, fasten'	<i>y'dzárva</i> 'look at, watch, visit'
<i>ynda</i> 'swallow, block'	<i>wada'</i> 'swear'	<i>y'dzódzana</i> 'slander'
<i>yndaka</i> 'group together'	<i>wala'</i> 'speak'	<i>dzíga</i> 'hit (with an object)'
<i>ndaha</i> 'read'	<i>mala'</i> 'reconcile, help'	<i>dzágwa¹</i> 'pray'
<i>ndasla</i> 'cool'	<i>bangwatsa'</i> 'batter'	<i>dzágwa²</i> 'be able'
<i>ndara</i> 'build, make'	<i>y'danga'</i> 'be in fighting position'	<i>dzágwa³</i> 'join (two things of the same kind, especially string, rope)'
<i>yndawa</i> 'block up'	<i>daka'</i> 'be tactful'	<i>dzáva</i> 'mix, unite'
<i>ynduva</i> 'lessen'	<i>y'duda'</i> 'encircle'	<i>dzángwa</i> 'nod'
<i>yndzera</i> 'sort'	<i>dza'</i> 'measure'	<i>y'dzá</i> 'exist, happen, be'
<i>ndza</i> 'sit, stay'	<i>dzabá</i> 'repair something torn or cracked'	<i>dzába</i> 'sprinkle'
<i>ngára</i> 'cool in small quantity'	<i>y'dzaha'</i> 'assemble, gather'	<i>dzábala</i> 'trickle'
<i>yngárawa</i> 'despise'	<i>dzala'</i> 'turn, twist'	<i>y'dzábala</i> 'whip'
<i>nga</i> 'set a trap'	<i>dzama'</i> 'think'	<i>y'dzádfa</i> 'pick out'
<i>ubáza</i> 'laugh, smile'	<i>y'dzama¹</i> 'meet'	<i>dzádaha</i> 'decorate'
<i>uzá</i> 'eat (something that doesn't have to be chewed), swindle, wear out'	<i>y'dzama²</i> 'think'	<i>dzáwa¹</i> 'aim'
	<i>dzava'</i> 'pile up'	<i>dzáwa²</i> 'bring grain out from water'
	<i>gasa'</i> 'take, catch'	<i>dzáma</i> 'do first grinding'
	<i>gama'</i> 'meet, surround'	<i>dzába</i> 'become ill'
	<i>gwarsa'</i> 'sprain'	<i>dzágwa</i> 'provoke'
	<i>gwa'</i> 'compare'	<i>dzúba</i> 'cover the bottom rock of granary with mud'
	<i>gwata'</i> 'guard, wait'	<i>góda</i> 'get stuck, stopped, miss, delay'
	<i>gwasa'</i> 'guard, wait for'	<i>góla</i> 'grow'
	<i>vusa'</i> 'put in ashes'	<i>góra</i> 'frighten'
	<i>zagwá</i> 'shake hands'	<i>górdá</i> 'fall out (hair)'
	<i>mbárza</i> 'do something before someone else'	<i>górvá</i> 'chase'
	<i>y'ndzawa'</i> 'bite, burn'	<i>góðá</i> 'shake'
	<i>ngérsá</i> 'coagulate'	<i>y'góðáza</i> 'move, shake'
	<i>ngwába'</i> 'wear out, weaken'	<i>góðéra</i> 'tremble'
	<i>ngwada'</i> 'tie, bind'	<i>gágažla</i> 'lose heart'
		<i>góðá</i> 'curse'
		<i>góðzla</i> 'cut, divide, distribute'
		<i>góðá</i> 'associate with'
		<i>góðá</i> 'try'
		<i>gáðza</i> 'eat something dry'
		<i>gwóðba</i> 'bend'
		<i>gwóðba</i> 'rot'

Tone Class 2

<i>y'basa'</i> 'suck'	<i>bárnsa</i> 'apply a compress, sponge'
<i>baka'</i> 'do, happen'	<i>bárda</i> 'burry, chase (to catch)'
<i>básla'</i> 'be replete'	<i>báya</i> 'pay'
<i>bala'</i> 'weave'	<i>bázla</i> 'push'
<i>dmambá</i> 'leave'	<i>bángwa</i> 'pour from a container with a small mouth'
<i>daha'</i> 'make, sew'	<i>báta</i> 'eat (powder)'
<i>dasla'</i> 'store, prepare, repair'	
<i>dula'</i> 'keep fire smoldering'	
<i>y'pada'</i> 'roll up, wrap up'	
<i>pata'</i> 'persuade, flatter, court'	
<i>para'</i> 'wash'	
<i>fada'</i> 'come together, group, coil up'	
<i>futa'</i> 'blow'	
<i>ta'</i> 'cook'	
<i>tapa'</i> 'taste, do a little'	
<i>taka'</i> 'try'	
<i>y'takwala'</i> 'crumple'	
<i>tala'</i> 'touch'	
<i>tsakwada'</i> 'lie in wait for, catch'	
<i>y'tsəhwana'</i> 'store up'	
<i>tsawa'</i> 'reach, arrive at'	

Tone Class 3a

<i>bárnsa</i> 'apply a compress, sponge'
<i>bárda</i> 'burry, chase (to catch)'
<i>báya</i> 'pay'
<i>bázla</i> 'push'
<i>bángwa</i> 'pour from a container with a small mouth'
<i>báta</i> 'eat (powder)'

<i>gwávataq</i> 'cook beans'	<i>ndágwa</i> 'count'	<i>yfédá</i> 'cut off the head of grain (for threshing)'
<i>gwáda¹</i> 'make an apparition'	<i>ndáva¹</i> 'run out, end'	<i>férta¹</i> 'escape'
<i>gwáda²</i> 'convoke someone'	<i>ndáva²</i> 'console, explain'	<i>férta²</i> 'blow'
<i>yvótsa</i> 'be crafty'	<i>ndáva</i> 'ask'	<i>fíkwá</i> 'whistle'
<i>várdá¹</i> 'build well'	<i>náúla</i> 'miss'	<i>tsdá</i> 'pull'
<i>várdá²</i> 'cause to suffer'	<i>ndzédá¹</i> 'remove something fixed or stuck'	<i>tsárá</i> 'build a foundation'
<i>vársla</i> 'crush'	<i>ndzédá²</i> 'come out or appear in number'	<i>táká</i> 'practice'
<i>várdahwa</i> 'scrape'	<i>ndzágá</i> 'place a solid object (upright)'	<i>tskwlá</i> 'tie up bundles'
<i>várvla</i> 'scrape (to clean)'	<i>ndzává</i> 'plant, stick together'	<i>tarbá</i> 'cause to suffer'
<i>váraha</i> 'vomit'	<i>yndzúma</i> 'soak'	<i>témá</i> 'be left over'
<i>yvávada</i> 'be well formed'	<i>ngáda</i> 'clear (a field)'	<i>tsgwá</i> 'count'
<i>váza</i> 'exceed'	<i>yngáda¹</i> 'hunt, catch, invite'	<i>tévá</i> 'redden'
<i>vála</i> 'run, hurry'	<i>yngáda²</i> 'incur, contract'	<i>tambá</i> 'chase after'
<i>yvádagalaha</i> 'writhe in grief'	<i>ngásila</i> 'break, snap, pick'	<i>tambára</i> 'make round'
<i>záha</i> 'make wrong side out'	<i>ngála</i> 'prevent'	<i>tangwá</i> 'shake'
<i>yzáha¹</i> 'accept, receive, welcome, reply'	<i>yngára</i> 'block'	<i>tabára¹</i> 'separate by shaking'
<i>zárlka</i> 'lose weight'	<i>ngázla</i> 'break, shatter'	<i>tabára²</i> 'fatten for slaughter'
<i>záwla</i> 'carry something heavy, have bad luck'	<i>ngá</i> 'stick to'	<i>takáda</i> 'calm'
<i>záva</i> 'do something several times'	<i>ngála</i> 'cross, climb'	<i>takwásá</i> 'tie up leg'
<i>zámbára</i> 'call workparty together'	<i>ngwáza</i> 'smoke'	<i>takwásla</i> 'knock down'
<i>zánga</i> 'hate'	<i>ngwá</i> 'want, like, love'	<i>tasá</i> 'pound to take off outer shell'
<i>zá</i> 'turn'		<i>tahá</i> 'appear, show'
<i>záda</i> 'spend wastefully'		<i>tamáha</i> 'think'
<i>zákwa</i> 'force to do'		<i>tavá</i> 'show'
<i>zála</i> 'drag'		<i>ytsébá</i> 'kill'
<i>zámbá</i> 'cheat'		<i>ytsédá</i> 'make pointed'
<i>zámbára</i> 'push down'	<i>béhwá</i> 'hide'	<i>tséká</i> 'cause fire to blaze'
<i>zláda</i> 'push around'	<i>ybéslá¹</i> 'forge'	<i>ytsékwá</i> 'think'
<i>zláha²</i> 'knock over'	<i>ybéslá²</i> 'go bad (food)'	<i>tsahá</i> 'begin to eat'
<i>zlála</i> 'pierce, make a hole'	<i>bazá</i> 'spoil, destroy'	<i>tsahwáda</i> 'make furrows'
<i>zlárda</i> 'dislodge, fire'	<i>basá</i> 'tolerate, endure'	<i>tsárásla</i> 'smash (bones)'
<i>zlága</i> 'sow'	<i>ybasá</i> 'forgive, excuse'	<i>tsawá</i> 'be good, beautiful'
<i>zlázlava</i> 'swim'	<i>bazlá</i> 'make several, pile up'	<i>tsaná</i> 'hear, understand, obey'
<i>zlánqa</i> 'place/lay (horizontally), bar'	<i>ydzásá</i> 'squeeze out (a liquid), strain'	<i>tsébá</i> 'follow'
<i>zlá</i> 'help'	<i>dágá</i> 'hit'	<i>tsabásá</i> 'draw, spot'
<i>mbáda¹</i> 'change'	<i>ydázá</i> 'do a rite for protection'	<i>ytsadá</i> 'immunize'
<i>mbáda²</i> 'collapse, fall'	<i>ydzálá</i> 'build (with stones or bricks)'	<i>tsapá</i> 'praise'
<i>mbáda³</i> 'pour (e.g., grain)'	<i>dzásá</i> 'cut (i.e., hair)'	<i>tsapára</i> 'slap'
<i>mbáda⁴</i> 'speak'	<i>dalá</i> 'cut in strips'	<i>tsafá</i> 'plait'
<i>mbála¹</i> 'spread out, lay out'	<i>dabá</i> 'follow, accompany'	<i>tsatsá</i> 'repair'
<i>mbála²</i> 'be too much'	<i>diká</i> 'squeeze together'	<i>tsakála</i> 'beg'
<i>mbálsalá</i> 'dry'	<i>ypadá</i> 'peel'	<i>tsakwásla</i> 'hoe hurriedly'
<i>mbárzlá</i> 'crack'	<i>pásá</i> 'unseal granary'	<i>tsakwára</i> 'grow quickly'
<i>mbárza</i> 'hate'	<i>péláha</i> 'clean beans'	<i>tsahála</i> 'pronounce'
<i>mbára</i> 'overwhelm'	<i>pérátsa</i> 'tear'	<i>ytsahwá</i> 'tighten'
<i>mbáwa</i> 'cover over'	<i>pardá</i> 'dislocate joint'	<i>tsaslá¹</i> 'pour'
<i>mbáda</i> 'gather, pick (pl. object)'	<i>ypardá</i> 'rub to clean'	<i>tsaslá²</i> 'sow during drought'
<i>mbáha</i> 'take, catch (pl. object)'	<i>patsá</i> 'clear a field'	<i>tsará</i> 'be good, kind'
<i>mbáva</i> 'rise, raise'	<i>paká</i> 'lift up something flat'	<i>tsifá</i> 'dampen'
<i>mbúté</i> 'catch (an infectious disease)'	<i>paslá</i> 'kill (pl.)'	<i>tsislá</i> 'build with stone'
<i>ndába</i> 'burn'	<i>palá</i> 'final weeding'	<i>tsufá</i> 'pay homage to'
<i>ndáda</i> 'drip'	<i>pavá</i> 'arrive'	<i>kákáda</i> 'massage'
<i>yndáha</i> 'mark'	<i>piyá</i> 'hold, take hold of'	<i>kékára</i> 'crow'
<i>ndála</i> 'cut in two'		<i>késá</i> 'catch,'
		<i>ykéslápa</i> 'squash flat'

Tone Class 3b

<i>kəlā</i> ² '(tr) break something hard and long'	<i>hwərsá</i> 'crush (into powder)'	<i>mətsərā</i> 'remove (oneself) unnoticed'
<i>kəlā</i> ² 'return'	<i>hwəyá</i> 'damage (by water)'	<i>məzā</i> 'crush, level'
<i>kərdā</i> 'grind'	<i>'hwədzá</i> 'shake up'	<i>'məzā</i> 'smell'
<i>kəzlá</i> 'close'	<i>hwədzába</i> 'disorder'	<i>'madákwa</i> 'whiten'
<i>kafá</i> 'pay'	<i>hwəvá</i> 'crush (into powder)'	<i>madáha</i> 'decorate'
<i>kawára</i> 'do second cultivation'	<i>hwəmbáta</i> 'dent'	<i>masá</i> 'wipe, smear'
<i>'kwədátsa</i> 'squeeze'	<i>hwəmbá</i> 'infect'	<i>mará</i> 'illuminate, show'
<i>'kwədá</i> 'carve'	<i>hwəndzába</i> 'chop up'	<i>'magwá</i> 'roof with stalks'
<i>'kwədáslə</i> 'dissolve by kneading'	<i>hwabá</i> 'stir up'	<i>mazá</i> 'fight'
<i>kwakwára</i> 'make blisters'	<i>hwabá</i> 'stir, mix'	<i>nəká</i> 'see'
<i>kwəsláha</i> 'cough'	<i>hwasá</i> 'carry corn to the threshing floor'	<i>nəngá</i> 'see'
<i>kwərā</i> 'measure'	<i>hwälába</i> 'stir up'	<i>naká</i> 'see, look'
<i>kwəváha</i> 'have sexual relations'	<i>sləkáwa</i> 'obey, respect'	<i>'naná</i> 'despise'
<i>kwavá</i> 'fear'	<i>slərdá</i> 'take off leaves'	<i>ubóla</i> 'keep watch'
<i>'kwazá</i> 'set (sun)'	<i>sləvá</i> 'bail out all water'	<i>upadá</i> 'chew'
<i>kwazlóhwa</i> 'stretch'	<i>sləngədá</i> 'choke'	<i>ufá</i> ¹ 'heat, boil'
<i>kwəzlá</i> 'rinse (the mouth)'	<i>sləslá</i> 'calculate'	<i>ufá</i> ² 'itch'
<i>kwadáha</i> 'boil, cook'	<i>slihá</i> 'smear'	<i>ufadá</i> 'play (a wind instrument)'
<i>kwaslá</i> ¹ 'crack off'	<i>ləkvwá</i> 'take (pl.)'	<i>'utsáka</i> 'sprinkle'
<i>kwaslá</i> ² 'boil something thick'	<i>ləhá</i> 'be curious, respect'	<i>'usá</i> 'confuse'
<i>kwamá</i> ¹ 'wear out, overcome'	<i>labá</i> 'mix'	<i>usá</i> ¹ 'stir'
<i>kwamá</i> ² 'slander'	<i>lahá</i> 'dig'	<i>usá</i> ² 'arrive at'
<i>kwandzáka</i> 'scrape the surface only'	<i>rabá</i> 'be fertile'	
<i>səfáha</i> 'wear out'	<i>radá</i> 'pick all'	
<i>sagá</i> 'grow, increase'	<i>ratá</i> 'shred'	
<i>səngwá</i> 'cradle'	<i>rəhá</i> ¹ 'fill'	
<i>sadá</i> 'brush off'	<i>rəhá</i> ² 'dance, stamp'	
<i>'safá</i> 'breathe'	<i>razlá</i> 'acquaint'	
<i>satá</i> 'comb'	<i>ratsá</i> 'cut several times'	
<i>satára</i> 'become dry'	<i>yəbá</i> 'flatter'	
<i>sangá</i> 'clean out (a dish)'	<i>yəbá</i> 'pour, flow'	
<i>sudá</i> 'poison'	<i>yəyádá</i> 'sort out'	
<i>hətsákwa</i> 'lift something heavy'	<i>wəlá</i> ¹ 'cut, wound'	
<i>hardá</i> 'scrape'	<i>wəlá</i> ² 'begin sowing'	
<i>hərgá</i> 'insult'	<i>wərā</i> 'open'	
<i>'hərzá</i> 'be near'	<i>matá</i> 'split, tear'	
<i>'həmgá</i> 'incline'	<i>metadá</i> 'lick, lap'	
<i>'hədzá</i> 'scrape'	<i>'mətsá</i> 'die'	
<i>'hadá</i> 'nauseate'	<i>mətsá</i> ¹ 'exceed'	
<i>halá</i> 'grow old'	<i>mətsá</i> ² 'take hold of'	
<i>'hwədá</i> 'take by surprise'	<i>'mətsədá</i> 'suck'	
<i>hwahwára</i> 'enlarge a hole'	<i>mətsaká</i> 'grill (not in a receptacle)'	
<i>hwərába</i> 'chew'		
	<i>'paráka</i> 'jump, bound'	
	<i>tadá</i> 'pour, draw (liquid)'	
	<i>'təzá</i> 'prick, pierce'	
	<i>tsərvá</i> 'run away'	
	<i>hwəlvá</i> 'make a loud noise'	
	<i>mətsədáka</i> 'shine'	
	<i>məzá</i> 'be in superfluity'	
	<i>maslá</i> 'leave'	
	<i>usalá</i> 'look for'	

Tone Class 4a

dəgəza 'flow abundantly'
válaha 'scold severely'
mbóla 'depart, send, throw'
ndáha 'become fat'
ngwálima 'get better, cure'

Tone Class 4b

'paráka 'jump, bound'
tadá 'pour, draw (liquid)'
'təzá 'prick, pierce'
tsərvá 'run away'
hwəlvá 'make a loud noise'
mətsədáka 'shine'
məzá 'be in superfluity'
maslá 'leave'
usalá 'look for'

Tone in Five Languages of Cameroon

Publications in Linguistics 102

This volume is, in many respects, an extension of *Tense and Aspect in Eight Languages of Cameroon*, publications in linguistics 99, and includes contributions from some of the same authors. The earlier volume demonstrated that semantic properties of tense and aspect were often signaled by tone changes. The present volume, by its focus on tone changes found in other areas of the grammar of the same languages, complements those descriptions.

Many of the same kinds of tonal phenomena (downstep, down-drift, floating tones, tonal morphemes, toneless morphemes) which occur in the Grassfields Bantu languages are also quite frequent in Narrow Bantu languages, especially those of southern Cameroon. This volume contains descriptions of four of these languages—Makaa, Kako, Nomaánde, and Nugunu—as well as a chapter on Podoko, a Chadic language. This attempt to handle significant amounts of data with various tone theories should help us to understand more clearly the advantages and disadvantages of specific theories and to formalize a theory which better handles a wide array of tone phenomena in a simple and insightful manner.

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