

TONOLOGY OF THE BABANKI NOUN

Larry M. Hyman
University of Southern California

In the present paper an abstract analysis is proposed to account for a number of intricate tonal alternations found in Babanki, a Grassfields Bantu language of the Ring (Nkom) subgroup spoken in Cameroon. This analysis, which makes heavy use of floating tones in underlying forms differing markedly from their surface realizations, as well as postulating ten ordered tone rules, essentially recapitulates the tonal history of the language.

1. Introduction

Within the last few years a sizeable body of tonal data has been collected and analyzed from several of the Grassfields Bantu (GB) languages spoken in Cameroon. Central to the analysis of each unraveled system has been the use of floating tones, both lexical and grammatical. Pursuing the findings of Voorhoeve [1971] for Bamileke-Bangangte, a comparative study by Hyman and Tadadjeu [1976] presented the general tonal properties of the Mbam-Nkam languages, the languages of the eastern branch of GB (see Hyman and Voorhoeve [in press]). Concerning the western branch, the members of the Grassfields Bantu Working Group are now in the position to build on the start made in Ngie [Hombert 1976], Ngamambo [Asongwed and Hyman 1976], and Ngwo [Voorhoeve 1978], all of the Momo subgroup of WGB (cf. also Stallcup [1978]).

The present paper is intended as a contribution to the understanding of tone in the Ring [formerly Nkom] subgroup of

WGB.¹ As demonstrated in Hyman [in press], this group consists of a western group, e.g. Aghem, Weh, Isu, a central group, e.g. Kom, Bum, Babanki, Oku, and an eastern group, e.g. Lamnsoq, Babessi Babungo, Bamessing. While a few comparative remarks will be made in section 5, I have chosen in this paper to illustrate the tonal properties of this subgroup by focusing on Babanki, the southernmost Ring language. As in the above cited works, my concern will be the nature of underlying tonal representations as well as the nature of the rules required to bring these tonal representations to the surface. The analysis presented in the following sections is a highly abstract one, since underlying tonal representations differ considerably from their surface realization. It is, however, the one analysis that has been found to account for Babanki tone in an explanatory way.

2. The Surface Tones

Babanki has a terrace-level tone system with downstepping of high tone. In addition to high (H) and low (L) tone, downstepped high ('H) is thus possible after another H (whether downstepped or not). Babanki also has an opposition between low (L) vs. non-

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falling or level low (L°) before pause, as in many GB languages. Finally, a mid (M) tone occurs, but with the unusual constraint that it must be followed by a H tone. The possible phonetic sequences involving three syllables are illustrated in (1):

- | | | | | |
|--------|---------|--|--------|--|
| (1) a. | H-H-H | [⁻ - ⁻ - ⁻] | L-H-H | [₋ - ⁻ - ⁻] |
| | H-H-'H | [⁻ - ⁻ -] | L-H-'H | [₋ - ⁻ -] |
| | H-H-L° | [⁻ - ⁻ - ₋] | L-H-L° | [₋ - ⁻ - ₋] |
| | H-H-L | [⁻ - ⁻ - ₋] | L-H-L | [₋ - ⁻ - ₋] |
| b. | H-'H-H | [⁻ - -] | | |
| | H-'H-'H | [⁻ - -] | | |
| | H-'H-L° | [⁻ - - ₋] | | |
| | H-'H-L | [⁻ - - ₋] | | |
| | H-M-H | [⁻ - - ⁻] | L-M-H | [₋ - - ⁻] |
| c. | H-L-H | [⁻ - ₋ - ⁻] | L-L-H | [₋ - ₋ - ⁻] |
| | H-L-L° | [⁻ - ₋ - ₋] | L-L-L° | [₋ - ₋ - ₋] |
| | H-L-L | [⁻ - ₋ - ₋] | L-L-L | [₋ - ₋ - ₋] |

In the tonal sequences on the left the initial tone is H; in the sequences on the right the initial tone is L. The sequences in (1a) involve a H as the second tone; the sequences in (1b) involve a tone one step lower than H (either 'H or M, as seen); and the sequences in (1c) involve a L as the second tone. There are thus 20 different tonal sequences possible on three syllable stretches.

The following generalizations thus characterize the Babanki tone system: (i) there is only a two-way contrast after pause (H and L); (b) each successive 'H establishes a ceiling; and (c) M tone is possible only if followed by H (and never utterance-initially). Note that the sequence H-M is identical, phonetically, to the sequence H-'H. The two are distinguishable, however, since 'H establishes a ceiling for future H tones within the same tonal phrase, while M does not (and indeed requires a higher tone to

immediately follow it). It is the generalization in (c) which makes Babanki slightly different from other terrace-level tone systems, and I shall provide an account of the M tone phenomenon below.

Given the above properties of the surface tone system, we can now address the surface tones of nouns in Babanki. Although the discussion of Babanki tonology will be restricted to nouns (indeed to a very limited set of noun phrase data), what will be said about the tonal properties of these forms is directly applicable to verbal constructions, as work jointly conducted with H. Jisa has demonstrated. We shall be concerned only with the vast majority of nouns whose stems are monosyllabic. The following tonal patterns were discernable from a corpus of 195 Babanki nouns with monosyllabic stems:

(2)	<u>pattern</u>	<u>#</u>	<u>%</u>	<u>example</u>	<u>remarks</u>
a.	L-L	37	18.97	kə̀kòs 'slave'	
b.	L-L°	16	8.21	kə̀mbò° 'bag'	type 2b almost all have stem initial -NC
c.	L-H	113	57.95	kə̀kém 'crab'	
d.	L	8	4.10	nàm 'animal'	} all in class 1 or 9
e.	L°	15	7.69	dzè̀m° 'back'	
f.	H	5	2.56	bú 'dog'	
g.	H'H	1	.51	mú'ú 'water'	only example of its kind

As can be seen in (2), nouns with monosyllabic stems are found both with and without a prefix. In the latter case there are three patterns, L, L°, and H, representing the three tones contrasting before pause. All such nouns belong either to class 1 (which includes human singulars) or class 9 (which includes animal singulars). The noun class prefixes and concords are given in (3):

(3)	<u>class</u>	<u>noun prefix</u>	<u>concord</u>	<u>class</u>	<u>noun prefix</u>	<u>concord</u>
	1	Ǿ-, ñ-	ɣ̀	7	kə-	k'
	2	və-	v'	8	ə-	v'
	3	ə-	ɣ'	9	Ǿ- ñ-	z̀
	5	ə-	z'	10	Ǿ-, ñ-...-sé	s'
	6	a-	ɣ'	13	tə-	t'
	6a	mə-	m̀	19	fə-	f'

Classes 1 and 9 have either a low tone nasal prefix or a non-segmental (floating) L as their prefix. All of the other classes have prefixes whose tone is phonetically L in most cases, but underlyingly H in all but a few constructions (see section 3). It is for this reason that their tone has been left unmarked (except for ñ- in class 10, the only class which also marks nouns with a suffix, e.g. ñám-'sé 'animals'). Although the concords will not be relevant to our discussion, note that classes 1, 6a, and 9 have L while the remaining classes have H tone concord.

The bulk of our discussion will center around bisyllabic nouns which typically consist of a L tone prefix and either a L, L°, or H monosyllabic stem, as seen in (2a-c). Of these patterns, (2a) and (2c) are very frequent, while (2b) seems restricted, especially to nouns which have stem-initial NC sequences. We shall have more to say about these below.

3. The Underlying Tones

We begin our discussion of underlying tones by considering nouns whose surface pattern is L-H (2c). As seen in (2c), these comprise 113 of the 166 bisyllabic nouns in the sample, or slightly over two-thirds. The statistical lopsidedness of this pattern is something which requires an explanation. The nouns we shall use to illustrate the tonal properties of the L-H pattern are: A. kə̀-fó 'medicine'; B. kə̀-fó 'thing'; C. kə̀-kém 'crab'. As indicated, class 7 nouns fall into three

subclasses, A, B, and C, which behave differently in context. These differences in behavior cannot be predicted from the segmental or syllabic composition of these words. In all examples, whether illustrating surface or underlying tonal structure, the segmental information is in broad phonetic transcription.

The noun-plus-noun ("N₁ of N₂") associative construction offers an ideal context for the study of the tonal properties of nouns, as has been demonstrated for other GB languages. Thus, consider the above three nouns in N₁ position in (4):

- (4)
- | | | | |
|---|-------|---------|----------------------|
| A | kèfó | 'ké ñàm | 'medicine of animal' |
| B | kèfó | 'ké ñàm | 'thing of animal' |
| C | kèkém | ké ñàm | 'crab of animal' |

Here we observe that when these nouns occur in N₁ position followed by the H tone associative marker ké of class 7, which they condition, the latter is lowered to 'H after A and B, but not after C. We therefore have cause to separate L-H nouns in two groups, A/B vs. C.

However, consider the examples in (5):

- (5)
- | | | | |
|---|-----|----------|----------------------|
| A | ñàm | è kèfó° | 'animal of medicine' |
| B | ñàm | è kèfó | 'animal of thing' |
| C | ñàm | è kèkém° | 'animal of crab' |

Here, we see that when these nouns occur in N₂ position after the L tone associative marker è of class 9, A and C become L-L°, while B remains L-H. We therefore have the second grouping, A/C vs. B.

A third grouping arises when nouns occur in N₂ position after the H tone associative marker ké of class 7, as in (6):

- (6)
- | | | | |
|---|------|----------|---------------------|
| A | kèší | ké kèfó° | 'place of medicine' |
| B | kèší | ké kèfó | 'place of thing' |
| C | kèší | ké kèkém | 'place of crab' |

A becomes H-L°, while B and C become H-'H, giving a third grouping, A vs. B/C.

From the examples in (4), (5), and (6), it is clear that A, B and C nouns require different underlying tonological representations if we are to account for their different tonal behavior in context. To account for tone in other GB languages, it has been proposed that each stem consists of an underlying segmental tone (H or L), followed by a nonsegmental or floating tone (also either H or L). The 'H created in (4) suggests that A and B have a floating tone L (\underline{L}) in their underlying representation, i.e. $k\grave{a}-f\acute{o}'$ and $k\grave{a}-f\acute{o}'$, while C forms have a floating H tone (\underline{H}), i.e. $k\grave{a}-k\acute{e}m'$. While this would effectively distinguish A and B from C in (4), it would not account for the different behaviors of A and B in either (5) or (6). For this the analysis must become considerably more abstract.

Looking at the data in (5) we note that A and C have what would have been pronounced L-H in isolation (or N_1 position) being pronounced $L-L^\circ$ in N_2 position after a L tone associative marker. Our experience from the GB languages suggests that the L° tone comes from the simplification of $L-L-\underline{H}$. There seem to be two possible channels: (i) $L-L-\underline{H}$ becomes $L-L-\underline{L}^\circ$ by lowering of \underline{H} before pause, and then the floating tone is deleted (or absorbed into the preceding syllable), leaving $L-L^\circ$; or (ii) $L-L-\underline{H}$ becomes $L-LH$ by "grounding" the \underline{H} to the preceding syllable. This creates a rising tone which can then simplify to L° before pause. Looking at the data in (5) and (6), we see that the following underlying forms can be given to N_2 nouns:

- (7) A / $k\grave{a}-f\acute{o}'$ / (in N_2 position only)
 B / $k\grave{a}-f\acute{o}'$ /
 C / $k\grave{a}-k\acute{e}m'$ /

The $L-L-\underline{H}$ structure of (7A) simplifies to $L-L^\circ$ through an intermediate $L-L-\underline{L}^\circ$ stage (see section 4 for an explicit statement of all of the tone rules in the order in which they apply). The $L-L-\underline{H}$ structure of (7C) requires first the application of a L -spreading rule which converts this to $L-L-\underline{H}$, and then C nouns

undergo the same rules as A nouns to derive L-L°.

This analysis opens up a number of questions, the most serious of which is: why is it that the L prefix of nouns in N₂ position causes A and C nouns to become L-L°, but the L prefix of nouns in isolation (and, in fact, in most grammatical positions) does not? The answer is that noun prefixes in Babanki are underlyingly H *unless* a noun is in N₂ (or locative) position (or contains a tone depressor, e.g. a nasal—see below). Thus, the underlying forms corresponding to (7) but which are found other than in N₂ position are those in (8):

- (8) A /kê-fò' /
 B /kê-fó' /
 C /kê-kém' /

Thus, the complete underlying tonal representations for the phrases in (6) are given in (9):

- (9) A /kê-ší' # kɛ + kɛ-fò' /
 B /kê-ší' # kɛ + kɛ-fó' /
 C /kê-ší' # kɛ + kɛ-kém' /

In order to derive the correct surface forms, we first need a H-spreading rule to convert H-L to H-HL. This raises the tone of the kɛ- prefix in N₂ position, which then in the case of (9B) and (9C) gives the intermediate sequence HL-H, i.e. ...kɛ kɛ-fó' and ...kɛ kɛ-kém'. This sequence simplifies to H-'H, unlike (9A), where the intermediate form is ...kɛ kɛ-fò'. This latter form goes on to become ...kɛ kɛ-fò°.

What evidence is there that some L prefixes are underlyingly H and others are L? We will not insist, but only mention in passing that the western Ring languages, e.g. Aghem, have phonetic H and L tone prefixes in the environments where the above abstract Babanki analysis would predict them. The same analysis was argued for Ngamambo [Asongwed and Hyman 1976] and probably charac-

terizes all of the WGB languages. The major piece of corroborating evidence from Babanki itself involves the analysis of nouns which are L-L. The example given in (2a) was kək̀̀s 'slave'. In the present analysis such nouns will have H-L-L structure in all environments except N₂, where they have L-L-L structure. However, consider the surface tones in (10):

- (10) O kək̀̀s ḱ́e ñàm 'slave of animal'
 N k̀̀nd̀̀ŋ ḱ́e ñàm 'throat of animal'

We observe that L-L nouns must be subdivided into two classes, indicated by the letters O (for "oral") and N (for "nasal"). A noun in the O class changes from L-L to L-M when in the N₁ position before a H tone associative marker. A noun in the N class, e.g. k̀̀nd̀̀ŋ 'throat', remains L-L. The question is why?

One's initial temptation is to say that there is a rule which raises L-L to L-M before H, but which is blocked if the L-L noun belongs to the N class. It turns out that most N nouns have a -N- wedged between their prefix and the stem-initial consonant. Could this nasal be blocking the raising of the following L tone syllable?

There is reason to believe that this nasal is involved, but that a more general process is at work. A rule exists in Babanki of the form in (11):

- (11) L-HL-H → L-M-H

A HL falling tone is simplified to M if preceded by L and followed by H. A particularly clear example is obtained in certain possessive forms such as those given in (12) involving the class 5 form ̀̀ž́́ḿ́e 'mine':

- (12) a. ̀̀ẃ́ḿ́ ̀̀ž́́ḿ́e 'my egg'
 b. ̀̀ś́ŋ́́ ̀̀ž́́ḿ́e 'my tooth'
 c. = ̀̀ś́ū́́ ž́́ḿ́e

Both ̀̀ẃ́ḿ́ 'egg' and ̀̀ś́ŋ́́ 'tooth' are A nouns, i.e. their proposed

underlying tonal shape is H-L-H, although B and C nouns behave identically in this environment. In (12a) and (12b) we see that the L tone prefix of the possessive pronoun /è-žómé/ rises to M when it occurs between two H tones (we shall have more to say about this rule below). In (12c), however, the rule that deletes /ŋ/ intervocally has applied, which creates the intermediate structure èsó èžómé (which is followed by assimilation of è to derive oo, which then raises to uu in open syllable position in Babanki and acquires M tone by rule (11)).

Coming back to the M tone in the O noun in (10), it is suggested that it can be derived through rule (11) if we begin with the same H prefix we established for L-H nouns earlier. The proposed derivation is given in (13):

- (13) kékòs` kéké → kékòs kéké → kékòs kéké → kèkòs kéké → kèkòs kéké ...
 (a) (b) (c) (d) (e)

The underlying tones are given in (a). In (b) the final Ḷ has been absorbed into the preceding stem L. In (c) the H-spreading rule has applied. In (d), the prefix-lowering rule (yet to be formalized) has lowered the initial kéké-. Finally, in (e), rule (11) has applied to derive the correct L-M-H sequence. Thus, a more general application of rule (11) is possible, explaining the odd distributional constraint requiring that M be followed by H. This leaves the question of N nouns.

It has been stated that most N nouns have a stem-initial NC-sequence. It also was indicated that most L-L° nouns also have such a nasal. All L-L° nouns are realized L-L in N₁ position before a H tone associative marker, e.g.

- (14) kèmbò kéké ñàm 'bag of animal'

Finally, N L-L nouns and L-L° nouns do not undergo H-spreading onto their prefix, as seen in (15a) and (15b):

- (15) a. kə́ší kʉ́ kə̀ndòŋ 'place of throat'
 b. kə́ší kʉ́ kə̀mbò° 'place of bag'
 c. kə́ší kʉ́ kə́kòs 'place of slave'

As seen in (15c), the H of kʉ́ has spread onto the prefix of N₂ /kə̀-kòs'/, but not onto N₂ /kə̀-ndòŋ'/ or /kə̀-mbò'/. What this suggests is that L tone is somehow associated with prefixes followed by a NC sequence. It can be proposed, then, that even in N₁ position, N L-L nouns and L-L° nouns have an underlying L prefix, rather than the underlying H proposed for other noun prefixes. Thus, the reason why 'throat' does not become L-M in (10) is that it has an underlying L prefix, and the noun can therefore not undergo the derivation in (13). All L-L° nouns will have underlying L prefixes in all cases, although they necessarily represent a neutralization of underlying L-L-Ḥ and L-H-Ḥ, since we have seen that these two sequences merge as the result of the L-spreading rule. Then, what about the possibility of some L-H nouns having an underlying L tone prefix?

Such nouns would have to have the underlying structure L-H-Ḷ, since as we have just indicated, L-H-Ḥ merges with L-L-Ḥ and surfaces as L-L°. There are some L-H nouns which have stem-initial NC- (we shall refer to these as D nouns). Examples are kə̀ŋkwí? 'belt' and kə̀mpfó 'cadaver'. These nouns behave differently from other L-H nouns when in N₂ position after a H associative:

- (16) kə́ší kʉ́ kə̀ŋkwí? 'place of belt'

Instead of obtaining ...kə́ŋkwí? in (16), the H-spreading rule is blocked by the nasal. Since this leaves a L prefix between two H tones, it undergoes a raising rule and is pronounced M. The same blocking affect is observed when N₂ noun belongs to class 2 or 6a. Thus, the class 2 noun vəṭsón 'thieves' is pronounced M-H instead of H-'H in (17):

- (17) kə́ší kʉ́ vəṭsón 'the place of the thieves'

Compare the tonal differences obtained in the following forms involving a class 19 singular vs. a class 6a plural N₂ noun. Underlying stem tones are given to the right:

- (18) a. kàš́í kḗ fécò 'place of squirrel' /-cò`/
 kàš́í kḗ məcò 'place of squirrels'
- b. kàš́í kḗ fḗñìn° 'place of bird' /-ñìn`/
 kàš́í kḗ mḗñìn° 'place of birds'
- c. kàš́í kḗ fḗ'ḃé? 'place of gorilla' /-bḗ?`/
 kàš́í kḗ mḗḃé? 'place of gorillas'
- d. kàš́í kḗ fḗ'sés 'place of pepper' /-sés`/
 kàš́í kḗ mḗsḗs° 'place of peppers'

There are two alternative explanations for the behavior of classes 2 and 6a in N₂ position. The first is to treat the vḗ- and mḗ- prefixes as having an abstract tone depressor equivalent to a nasal. Such an abstract mark may be needed anyway because of such exceptional nouns as in (19):

- (19) /kḗ-bhì?`/ → [kḗbhì?°] 'dust'

where an underlying L prefix occurs without a following nasal. Perhaps this exceptional lowering is due to a nasal which was once present, historically, but which has dropped out in the present day language. Since many class 2 nouns begin with a NC sequence, e.g. vḗ-ntòn 'pots', pl. of ntòn, and since a few GB languages, e.g. Mbizinaku, have mḗN- as their class 6a prefix, this hypothesis has at least some justification. The second alternative is to say that it is the *voicing* of the prefix-initial consonant which blocks the H-spreading. This is a possible analysis since the other CV- prefixes all involve voiceless consonants, i.e. class 7 kḗ-, class 10 -sḗ/sḗ-, class 13 tḗ-, and class 19 fḗ-. The choice between these two alternatives can be made on the basis of the tonal behavior of L-L°. As seen in

(18b), if the noun belongs to class 6a (or 2), it also remains L-L°. However, if the noun neither has a nasal nor belongs to class 2 or 6a, but rather has an abstract tone depressor mark, as in (19), it *does* undergo H-spreading, as seen in (20):

(20) kàší kέ kábhì?° 'place of dust'

Thus, the abstract mark hypothesis which equates the class 2 and 6a prefixes with exceptional L tone prefixes such as that in 'dust', fails to make the correct prediction in (20), thereby leaving the second alternative as the tentative explanation. In any case, it seems most straightforward to mark all class 2 and 6a nouns as exceptions to the H-spreading rule.

The above alternations are summarized in the table in (21):

(21)	<u>underlying</u>	<u>in isolation</u>	<u>after L-assoc.</u>	<u>after H-assoc.</u>
a.	H-L-Ḷ	L-L	L-L	H-L
	H-L-Ḥ	L-H	L-L°	H-L°
	H-H-Ḷ	L-H	L-H	H-'H
	H-H-Ḥ	L-H	L-L°	H-'H
b.	L-L-Ḷ	L-L	L-L	L-L
	L-L-Ḥ	L-L°	L-L°	L-L° (but cf. 20)
	L-H-Ḷ	L-H	L-H	M-H
	(L-H-Ḷ)	(L-L°)	(L-L°)	(L-L°)

The sequence L-H-Ḥ and its derivatives are put in parentheses, since they merge in all cases with L-L-Ḥ because of the L-spreading rule mentioned earlier. The tone forms of nouns in N₁ position are the same as those in isolation except for the following: (i) L-L-Ḥ is pronounced L-L before both L and H; and (ii) H-L-Ḷ is pronounced L-M before H. There appears to be an on-going change in the language whereby the falling pitch or downglide of a L before pause is being generalized to other contexts. Thus, although (10) N and (14) were indicated as having the same tonal shape, there is a potential difference, as seen in (22):

- (22) a. kèndòṅ kḗ ñàm [_ ˩ ˩] 'throat of animal'
 b. kèmbò kḗ ñàm [_ _ ˩] 'bag of animal'

Compare also the potential differences between mḗcò 'squirrels' and mènñì° 'knives' in (23):

- (23) a. mḗcò mè ñàm [_ ˩ _] 'squirrels of animal'
 b. mènñì mè ñàm [_ _ _] 'knives of animal'

If the pre-pausal downglide continues to generalize such that L-L is pronounced [_ ˩] whenever in word-final position, a new statement will be required of the tone system. For the purposes of the rules presented in the following section, we shall not treat this phenomenon except to point out here that it serves to keep L-L and L-L° distinct in utterance-internal position.

4. The Rules

The underlying forms in (21) are quite different from any of their realizations on the surface. In this sense they are abstract. While the preceding discussion has been limited in scope, it has been demonstrated that these underlying forms permit an explanatory account of the tonal alternations found in Babanki. The rules that have been discussed thus far are all plausible and are frequently attested in tone languages. These rules are of four kinds:

- (i) tone-grounding: the assignment of a floating tone (T̥) to an adjacent syllable;
- (ii) tone-spreading: the spreading of a tone onto a following non-identically toned syllable;
- (iii) tone simplification: the conversion of a contour tone into a level tone; and
- (iv) tone lowering/raising: affecting only prefixes in Babanki, as when all H tone prefixes become L, or a L tone prefix becomes M between two H's.

Most of the rules required for Babanki were mentioned informally in the preceding section. The purpose of the present section is to formalize these rules and present them in the order in which they apply. It was originally hoped that some general

principle would predict the order in which the above four kinds of rules apply in Babanki, e.g. grounding would precede spreading, which would precede simplification, in a kind of feeding relationship. However the resulting analysis turned out to be unwieldy until it was determined that some of the assimilatory and simplificatory rules had to precede tone grounding, while others had to follow. The result is a set of ordered synchronic rules which recapitulate the historical changes characterizing earlier stages of the tone system. Two pairs of forms which gave considerable trouble are those in (24) and (25):

- (24) a. /k[́]é-kòs` k[́]é ñàm`/ → [k[́]èkòs k[́]é ñàm] 'slave of animal'
 b. /k[́]é-fò` k[́]é ñàm`/ → [k[́]èfò k[́]é ñàm] 'thing of animal'
- (25) a. /k[́]é-ší` k[́]é k[́]èfò`/ → [k[́]èší k[́]é k[́]éfò`] 'place of medicine'
 b. /k[́]é-ší` k[́]é k[́]èk[́]ám`/ → [k[́]èší k[́]é k[́]é`kám] 'place of crab'

The examples in (24) show that if we first apply tone grounding (to the left) and H-spreading (in either order), the N₁ nouns incorrectly merge as intermediate k[́]é-kòs and k[́]é-fò. The examples in (25) show that if L-spreading occurs too early, the N₂ nouns incorrectly merge as intermediate k[́]èfò` and k[́]èkám`. The following rules are therefore proposed to apply in the following order:

Rule 1: L → 'H / H ___ H

A floating L tone becomes a downstepped H when both preceded and followed by a H tone.

Rule 2: H-L → H- \widehat{HL}

A H tone spreads onto a following L tone syllable to derive a HL falling tone. This rule cannot be conditioned by or apply to floating tones. Its application is blocked when a L prefix is followed by a NC sequence, or when an N₂ noun belongs to class 2 or 6a.

Rule 3: \widehat{HL} -H → H-'H

A sequence consisting of a HL falling tone (produced by rule 2) followed by a H tone is simplified to a H tone followed by a downstepped H tone.

Rule 4: $L-H-\underset{\cdot}{H} \rightarrow L-L-\underset{\cdot}{H}$

A L tone spreads into a following H tone syllable when followed by a floating H tone (I have skipped the logically intermediate sequence L-LH- $\underset{\cdot}{H}$). Since this rule is blocked by a word boundary (whether occurring between L and H or between H and $\underset{\cdot}{H}$), the second H will automatically be a floating tone.

Rule 5: $L-\underset{\cdot}{H} \rightarrow L-L^{\circ} / _ _ //$

A floating H tone is lowered to a non-downgliding floating L when preceded by L and followed by pause(//). Some of these L- $\underset{\cdot}{H}$ // sequences derive from rule 4.

Rule 6: TONE GROUNDING (a) $\alpha\underset{\cdot}{T} \rightarrow \emptyset / \alpha T$
 (b) $H \ ' \underset{\cdot}{H} \rightarrow \widehat{H}H$
 (c) $\underset{\cdot}{T} \rightarrow \emptyset / //$
 (d) $L \underset{\cdot}{H} L \rightarrow L-\widehat{HL}$

The tone grounding processes are stated as four separate subrules. In (a) a floating tone is deleted whenever it is adjacent to an identical tone (into which it can be said to have been absorbed). In (b) whenever there is a H followed by floating downstepped H, the latter grounds to the left. (The one exception will be the sequence H 'H H, where the 'H is absorbed into the following H tone, which is identical by virtue of its being realized on the same pitch level.) In (c) any floating tones left stranded adjacent to a pause boundary are deleted. Finally, (d) represents the one environment I have found that is not covered by one of the preceding subrules. In this case, when a floating H is flanked by L tones on its left and right, it is grounded to the right, creating a HL falling tone.

Rule 7: $H_{\text{pref}} \rightarrow L / _ _ \lceil_{\text{stem}}$

All H tone prefixes are lowered to L before a stem (a condition which is required to prevent a H tone associative prefix, which forms a word with the following N₂, from being lowered to L).

$$\text{Rule 8: } \text{HL} \rightarrow \begin{cases} \text{L / L} \text{ --- } \left\{ \begin{array}{l} \text{L} \\ // \\ \text{H} \end{array} \right\} & \text{(a)} \\ \text{M / L} \text{ --- } \text{H} & \text{(b)} \\ \text{H} & \text{(c)} \end{cases}$$

In three ordered subrules the following simplifications of a HL falling tone take place: (a) L-HL simplifies as L-L when followed by L or pause; (b) L-HL simplifies to L-M when followed by H; (c) all remaining instances of HL simplify as H. Subrules (a) and (b) have complementary environments, while (c) will mostly simplify H-HL-L to H-H-L.

$$\text{Rule 9: } \text{L-}\widehat{\text{H}}\text{H} \rightarrow \text{L-H}$$

A L-H'H sequence simplifies to L-H. The L is important as a conditioning environment because of such forms as kèší ká wá'n' 'place of child' and mú'ú 'water', where H'H does not simplify after H and after a pause or word boundary.

$$\text{Rule 10: } \text{L}_{\text{pref}} \rightarrow \text{M / H} \text{ --- H}$$

The final rule discussed here raises a L prefix to M when it is both preceded and followed by H.

Sample derivations follow in (26):

(26)	/kə-fò' # ké + kə-wù' /	U.F.	/kə-kòs # ké + kə-kám' /
	kə-fò' ké kə-wù'	r.2	kə-kòs' ké kə-kám'
	kə-fó' ké kə-wù'	r.3	kə-kòs' ké ké'kám'
	kə-fó' ké kə-wù°	r.5	
	kə-fó 'ké kə-wù°	r.6	kə-kòs ké ké'kám
	kə-fó 'ké kə-wù°	r.7	kə-kòs ké ké'kám
	kə-fó 'ké ké-wù°	r.8	kə-kòs ké ké'kám
	'medicine of foot'		'slave of crab'

/mè-ńlín' # m̀ + k̀-kém'/'	U.F.	/ké-fó' # ké + m̀-ḥé'/'
mé-ńlín' m̀ k̀-kém'	r.1	ké-fó' ké m̀-ḥé'
mé-ńín' m̀ k̀-kém'	r.2	
mé-ńín' m̀ k̀-kém'	r.3	
mé-ńín' m̀ k̀-kém'	r.4	
mé-ńín' m̀ k̀-kém'	r.5	
mé-ńíh' m̀ k̀-kém'	r.6	ké-fó 'ké m̀-ḥé?
m̀-ńíh' m̀ k̀-kém'	r.7	k̀-fo 'ké m̀-ḥé?
m̀-ńín m̀ k̀-kém'	r.9	
	r.10	k̀-fo 'ké m̀-ḥé?
'birds of crab'		'thing of gorilla'

5. Conclusion

In the preceding sections an analysis was presented requiring underlying forms of considerable abstractness as well as ten ordered rules. Taken together these rules conspire to minimize the number of ups and downs in the surface tones, especially the number of contour tones, which are very rare in the language. The underlying forms are, in addition, identical with the historical reconstructions of the tone sequences once characterizing Babanki and the other Ring Bantu languages. The synchronic rules can thus be further seen as the stages the language has gone through in developing its current surface tonology. The analysis presented here has only addressed a fragment of the noun tonology of Babanki. Further efforts are underway by H. Jisa and myself to extend this analysis to other parts of the grammar (where we have had success in applying it) and to consider other less abstract alternatives. In addition, a comparative study of tone in the various Ring Bantu languages has begun and has already revealed a number of different systems deriving from the same underlying (=historical) tone forms recognized in the present study. For example, it is known that the western Ring languages and Babanki (of the central Ring group) have similar downstep systems. The remaining languages of

the central group (Kom, Bum, Bafmeng, Oku, Mbizinaku) all have systems with M tone instead of 'H, a system which Grebe and Grebe [1975] have also documented for Lamnsoq of the eastern group. One interesting question, then, will be to trace how the same underlying tones can develop in typologically divergent ways (i.e. into terrace- vs. discrete-level systems). Of particular interest is the relative chronology of tone grounding with respect to the various tonal assimilations and simplifications. It is assumed that the stage in the synchronic derivation where tone grounding takes place is identical to the historical point at which the syllabic support of these tones was lost and the tones had to be shifted elsewhere (or be dropped with their supports). Thus, in seeking to explain the surface alternations in Babanki tone, we have provided (unwittingly, as it were) a study in historical reconstruction and relative chronology as a first-step contribution to the understanding of tonal processes and tonal history.

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