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BABANKI VERB TONE

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In Babanki¹, a Grassfields Bantu language of northwestern Cameroon, several tonal patterns can be found on a single verb root depending on the construction in which the verb is used. An underlying high tone may surface normally as high, but unexpectedly as low, or high-falling; while underlying low tones surface as high, high-falling, or normally as low. For this reason the low tone verb can have a L(L), HL, or even H(H) surface melody while the high tone verbs can be L(H), HL, or H(H). Accounting for these melodies in order to reconstruct the underlying forms is necessary for a proper understanding of the Babanki verb tone in particular and the tonal system of Centre Ring Grassfields Bantu languages in general. This paper demonstrates that five tone rules (Downstep, Tone Docking, High Tone Spread, Low Tone Spread, and Upstep) and one phonological rule (Schwa Insertion) are required to account for the complex tonal system of Babanki verbs.

Keywords: Babanki, Bantu, tone, morphology

1. Introduction

This paper² accounts for the numerous surface tonal melodies found on the verb in Babanki, a Grassfields Bantu language of northwestern Cameroon. An examination of the verb system reveals that, depending on the construction type, up to three tonal patterns may be found on both low and high tone verbs (See §3.3 where it is shown that Babanki verbs have two lexical tones: high and low). An underlying high tone may surface normally as high, but unexpectedly as low, or falling while underlying low tones surface as high, falling, but normally as low. For this reason the low tone verb can have a L(L), HL, or even H(H) surface melody while the high tone verbs can be L(H), HL, or H(H). Sometimes, a high tone can be downstepped while a low tone can undergo upstep. Accounting for these melodies in order to reconstruct the underlying forms is necessary for a proper understanding of Babanki verb tone in particular and the tonal system of Centre Ring Grassfields Bantu languages in general. This is so because most of the work on tone in Babanki has focused on the nominal system (Hyman 1979, 1980; Akumbu 2011). A treatment of verb tone will therefore provide a more complete picture of Babanki tone and also lay the groundwork for

¹ Babanki (Kejom, as the native speakers call their language and villages), is spoken in Babanki Tungo (Kejom Ketinguh) and Big Babanki (Kejom Keku) in the North West Region of Cameroon by approximately 39,000 people (Ethnologue, 2015). As a Babanki native speaker I have provided the data used in this paper but also checked with two other native speakers, Nico Wukeh (41-year old male) and Regina Phubong (68-year old female), to confirm the phonetic level of each construction.

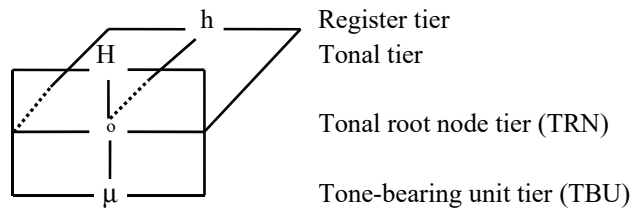
² Thanks to Larry Hyman, Shigeki Kaji, and Ngessimo Mutaka for their comments on this paper. I also gratefully acknowledge the opportunity I had to work on this paper when I was invited to the Graduate School of Asian and African Area Studies (ASAFAS), Kyoto University as a Visiting Research Scholar from July 1 to October 31, 2013.

analyzing the tone systems of the other languages in the group. This paper demonstrates that five tone rules (Downstep, Tone Docking, High Tone Spread, Low Tone Spread, and Upstep) and one segmental rule (Schwa Insertion) are necessary to account for the apparently complex tonal system of Babanki verbs. The theoretical frameworks used in the analyses are Register Tier Theory (RTT) and Autosegmental Phonology (AP). This paper is structured as follows: An overview of RTT is given in §2 and the Babanki verb system is introduced in §3 while §4 contains a presentation of tense, aspect and mood. The phonological processes that are recurrent in the verb system are discussed in §5. An expansion of the discussion to verbal reduplication is found in §6, which is followed by a conclusion.

2. An overview of register tier theory

Register Tier Theory (RTT) (Inkelas 1987; Inkelas et al. 1987; Snider 1988, 1990, 1999; Akumbu 2011) recognizes the following autosegmental features and tiers: the register features *h* and *l* on a REGISTER TIER, the tonal features *H* and *L* on a TONAL TIER, a TONAL ROOT NODE TIER (TRN), and a TONE-BEARING UNIT TIER (TBU). These tiers are geometrically arranged according to the configuration in Figure 1 taken from Snider (1999: 23).

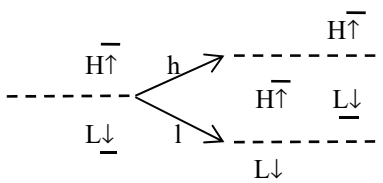
Figure 1: Geometry of tone



Features on the Register tier and the Tonal tier are linked to structural nodes on the TRN. Geometrically, these tiers form a separate plane with respect to the TRN. Nodes on the TRN are, in turn, linked to moras (μ) on the TBU tier (Snider 1999: 23).

The register features *h* and *l* are defined following Snider (1999: 25) as “effect a register shift *h*=higher, and *l*=lower relative to the preceding register setting”, and the tonal features *H* and *L* are defined as realize the “TBU at *H*=high pitch, and *L*=low pitch relative to the current register.” This is shown in Figure 2 (the dotted lines represent registers and the solid lines represent tones).

Figure 2: Register features and tonal features



The geometry in Figure 1 and the features in Figure 2 make it possible to specify up to four logically possible tonal distinctions, namely, a high tone on a high register, a high tone on a low register, a low tone on a high register, and a low tone on a low register. The register feature of any given TBU is specified in relation to that of the preceding register. The register of the initial TBU for its part is construed to be higher than or lower than the reference point that native speakers usually have in mind when beginning an utterance. Secondly, the tonal feature associated to any given TBU specifies whether the tone is low or high in relation to the current register. RTT is used in this paper to insightfully explain the tonal processes, given that within this theoretical model features on each tier can behave independently of one another.

3. The verb

In this section the structure of the Babanki verb is shown. The section comprises a presentation of the verb root, verbal extensions, and tone groups, which are relevant to the discussion of verb tone in the language.

3.1. Verb root. According to Akumbu & Fogwe (2012) only one-syllable roots are attested in Babanki except when there is verbal reduplication. The verb roots that appear to have two syllables always have a CV ending, which can be interpreted as an extension (see §3.2). Nevertheless, there are formal extensions that can be considered part of the root. Examples of the two verb root types are given below.

(1) Verb root types

One-syllable		Two-syllable	
<i>sàŋ</i>	‘dry’	<i>djìsà</i>	‘make a fire’
<i>tɔ̀</i>	‘pass’	<i>bàŋlà</i>	‘dodge’
<i>vì</i>	‘come’	<i>fìsà</i>	‘remove’
<i>dì</i>	‘cry’	<i>nàŋlà</i>	‘tickle’
<i>kám</i>	‘squeeze’	<i>báŋká</i>	‘show pride’
<i>búm</i>	‘hunt’	<i>tóŋtá</i>	‘sift’
<i>fáŋ</i>	‘fall’	<i>fáɽtá</i>	‘hurry up’
<i>kwén</i>	‘enter’	<i>búɽsá</i>	‘ignore’

The one-syllable roots can have either a CV or CVC structure whereas the two-syllable roots have a CV(C)CV structure. It can also be seen in the data above that the second of the two-syllable roots is always of the CV type, and that the V is always schwa. There are a good number of such roots that cannot stand alone without the second CV syllable, which is referred to in this paper as a “formal extension”.

In addition to these, there are two-syllable roots with a different structure. In this set, the second syllable begins with a glottal stop, followed by a vowel identical to that of the first syllable. This vowel has been referred to as an echo vowel (Akumbu & Fogwe, 2012).

(2) Echo Vowels

Echo Vowel Stem	Gloss
<i>màʔà</i>	‘throw’
<i>tàʔà</i>	‘become stiff’
<i>bjèʔè</i>	‘carry’
<i>fíʔí</i>	‘descend’
<i>mjàʔà</i>	‘blink’
<i>bjíʔí</i>	‘fold’

3.2. Extensions. The majority of what looks like two-syllable verbs results from the addition of a verbal suffix or extension³ to the root. At least five kinds of extensions are commonly found on verb roots, as illustrated below. A more extensive discussion of Babanki extensions can be found in Hyman (2013).

³ Verbal extensions in Babanki fall short of what is typical of Narrow Bantu in that there are no affixes for all extensions such as ‘applicative’, ‘passive’, ‘middle’ (impositive), etc., and most of these functions, where present at all, are based on combinations of autonomous lexical items. The common extensions are morphemes for ‘attenuative’, ‘intensity’, and ‘repetitive’, with different forms for the latter based on whether the verb is transitive or not.

(3) Verb extensions

-sə	-kə	-tə	-lə	-mə
<i>vì-sà</i> 'bring near'	<i>bvì-kà</i> 'fail repeatedly'	<i>mjà-tà</i> 'complete'	<i>kò-là</i> 'scrape many times'	<i>kwòl-mà</i> 'think together'
<i>kùm-sà</i> 'touch'	<i>djàn-kà</i> 'protrude'	<i>bàʔ-tà</i> 'scrape'	<i>dàŋ-là</i> 'spread'	<i>sù-mà</i> 'persist continually'
<i>fi-sà</i> 'remove'	<i>tʃò-kà</i> 'pass repeatedly'	<i>bùm-tà</i> 'meet someone'	<i>sì-là</i> 'caress many times'	<i>tʃò-mà</i> 'pass again and again'
<i>kwén-sá</i> 'send inside'	<i>fǎŋ-ká</i> 'fall repeatedly'	<i>báʔ-tá</i> 'arrange/plan'	<i>káŋ-lá</i> 'fry in part'	<i>pfwó-má</i> 'return'
<i>bén-sá</i> 'make dance'	<i>káʔ-ká</i> 'turn around'	<i>té-tá</i> 'select'	<i>té-lá</i> 'insult many times'	<i>fáŋ-má</i> 'gather several things'
<i>bwóm-sá</i> 'praise'	<i>bwi-ká</i> 'give birth a lot'	<i>ɲíŋ-tá</i> 'run hurriedly'	<i>fáʔ-lá</i> 'pin many times'	<i>kjé-má</i> 'allow to fall'

3.3. Tone groups. It is necessary to examine the infinitive or imperative verb forms of Babanki in order to determine which tone group a verb belongs to. Consider the following forms for illustration.

Table 1: Infinitive and imperative verb forms

Infinitive	Imperative	Infinitive	Imperative
<i>á-fùʔ</i> 'to bubble'	<i>fùʔá</i> 'bubble'	<i>á-[↓]fùʔ</i> 'to tune'	<i>fùʔ</i> 'tune'
<i>á-dəm</i> 'to grunt'	<i>dəmá</i> 'grunt'	<i>á-[↓]dəm</i> 'to play'	<i>dəm</i> 'play'
<i>á-mò</i> 'to narrate'	<i>mòá</i> 'narrate'	<i>á-[↓]mó</i> 'to deny'	<i>mó</i> 'deny'

In the infinitive form, all verb roots surface with a low tone or a downstepped high tone while in the imperative, they are either low-high or high. An account of downstep is given in §5.1. Therefore the two verb groups that can be identified in Babanki based on their tones are Low and High as illustrated in (4).

(4) Verb tone groups

Low tone verbs	High tone verbs
<i>fù?</i> ‘bubble’	<i>fú?</i> ‘tune’
<i>dám</i> ‘grunt’	<i>dám</i> ‘play’
<i>fàs</i> ‘break’	<i>fàs</i> ‘threaten’
<i>ʒwí</i> ‘pant’	<i>ʒwí</i> ‘kill’
<i>mò</i> ‘narrate’	<i>mó</i> ‘deny’
<i>kjè</i> ‘scrape’	<i>kjé</i> ‘allow’
<i>sò?</i> ‘seize’	<i>só?</i> ‘judge’
<i>mjàtá</i> ‘complete’	<i>bínsá</i> ‘lure to sleep’
<i>físà</i> ‘remove’	<i>ɲóʔsá</i> ‘open a little’

One-syllable verb roots are more common than those with two syllables.

4. Overview of tense, aspect, and mood

Babanki has an eight-way temporal distinction with four past tenses (immediate (P1), hordienal (P2), distant (P3), and remote (P4)), a present tense (P0), and three future tenses (immediate (F1), hordienal (F2), and remote (F3)).

A distinction can be made between perfective and imperfective aspect in Babanki. The imperfective aspect markers commonly used in the language are the progressive and habitual. When there is no explicit reference to the internal temporal constituency of a situation, it is understood as being perfective. In other words a construction with perfective aspect presents an event as a time-bounded whole, without regard to the internal constituency of that event. This aspect is marked by a floating low tone found before the verb root.

The Babanki verb system employs several moods to indicate the speaker’s attitude toward the factuality or likelihood of the action or condition expressed. The declarative, imperative, and potential are among the mood distinctions made in the language. A detailed discussion of Babanki tense, aspect, and mood can be found in Akumbu & Fogwe (2012). In the table that follows the affirmative, negative, progressive, and imperative forms are given for all tenses. The glosses have all been given only in the affirmative for clarity of presentation. Each gloss could be rendered in the negative, progressive and imperative form as needed.

Table 2: Tense, mood, aspect distinctions in Babanki

	Affirmative	Negative	Progressive	Imperative	Gloss (affirmative)
P4	Búńǎ nǎí lí kàbáǎn	Búńǎ kò nǎí ká' bǎǎn (bwén)	Búń jí nǎí kàbáǎn		Bung ate fufu
	Búńǎ nǎm lí kàbáǎn	Búńǎ kò nǎm ká' bǎǎn (bwén)	Búń jí nǎm kàbáǎn		Bung cooked fufu
	Búńǎ nsǎńtǎ lí kàbáǎn	Búńǎ kò nsǎńtǎ kàbáǎn (bwén)	Búń jí nsǎńtǎ kàbáǎn		Bung sifted fufu
	Búńǎ nǎè lí kàbáǎn	Búńǎ kò nǎè kàbáǎn (bwén)	Búń jí nǎè kàbáǎn		Bung lost fufu
	Búńǎ ńkúǎm lí kàbáǎn	Búńǎ kò ńkúǎm kàbáǎn (bwén)	Búń jí ńkúǎm kàbáǎn		Bung touched fufu
	Búńǎ nǎǎm lí kàbáǎn	Búńǎ kò nǎǎm kàbáǎn (bwén)	Búń jí nǎǎm kàbáǎn		Bung heated fufu
P3	Búńǎ tǎ ǎí ká' bǎǎn	Búńǎ kò tǎ ǎí ká' bǎǎn (bwén)	Búń jí nǎí kàbáǎn		Bung ate fufu
	Búńǎ tǎ lǎm ká' bǎǎn	Búńǎ kò tǎ lǎm ká' bǎǎn (bwén)	Búń jí nǎm kàbáǎn		Bung cooked fufu
	Búńǎ tǎ sǎńtǎ kàbáǎn	Búńǎ kò tǎ sǎńtǎ kàbáǎn (bwén)	Búń jí nsǎńtǎ kàbáǎn		Bung sifted fufu
	Búńǎ tǎ lè kàbáǎn	Búńǎ kò tǎ lè kàbáǎn (bwén)	Búń jí nǎè kàbáǎn		Bung lost fufu
	Búńǎ tǎ kúǎm kàbáǎn	Búńǎ kò tǎ kúǎm kàbáǎn (bwén)	Búń jí ńkúǎm kàbáǎn		Bung touched fufu
	Búńǎ tǎ lǎǎm kàbáǎn	Búńǎ kò tǎ lǎǎm kàbáǎn (bwén)	Búń jí nǎǎm kàbáǎn		Bung heated fufu
P2	Búńǎ jí ǎí ká' bǎǎn	Búńǎ kò jí ǎí ká' bǎǎn (bwén)	Búń jí nǎí kàbáǎn		Bung ate fufu
	Búńǎ jí lǎm ká' bǎǎn	Búńǎ kò jí lǎm ká' bǎǎn (bwén)	Búń jí nǎm kàbáǎn		Bung cooked fufu
	Búńǎ jí sǎńtǎ kàbáǎn	Búńǎ kò jí sǎńtǎ kàbáǎn (bwén)	Búń jí nsǎńtǎ kàbáǎn		Bung sifted fufu
	Búńǎ jí lè kàbáǎn	Búńǎ kò jí lè kàbáǎn (bwén)	Búń jí nǎè kàbáǎn		Bung lost fufu
	Búńǎ jí kúǎm kàbáǎn	Búńǎ kò jí kúǎm kàbáǎn (bwén)	Búń jí ńkúǎm kàbáǎn		Bung touched fufu
	Búńǎ jí lǎǎm kàbáǎn	Búńǎ kò jí lǎǎm kàbáǎn (bwén)	Búń jí nǎǎm kàbáǎn		Bung heated fufu
P1	Búńǎ ǎí lí kàbáǎn	Búńǎ kò ǎí ká' bǎǎn (bwén)			Bung ate fufu
	Búńǎ lǎm lí kàbáǎn	Búńǎ kò lǎm ká' bǎǎn (bwén)			Bung cooked fufu
	Búńǎ sǎńtǎ lí kàbáǎn	Búńǎ kò sǎńtǎ kàbáǎn (bwén)			Bung sifted fufu
	Búńǎ lè lí kàbáǎn	Búńǎ kò lè kàbáǎn (bwén)			Bung lost fufu
	Búńǎ kúǎm lí kàbáǎn	Búńǎ kò kúǎm kàbáǎn (bwén)			Bung touched fufu
	Búńǎ lǎǎm lí kàbáǎn	Búńǎ kò lǎǎm kàbáǎn (bwén)			Bung heated fufu

	Affirmative	Negative	Progressive	Imperative	Gloss (affirmative)
	Búńǎ kó ʒí kəbájn Búńǎ kó ʔlám kəbájn Búńǎ kó ʔsəjǎ kəbájn Búńǎ kó ʔlè kəbájn Búńǎ kó kùmə kəbájn Búńǎ kó ʔlìmsə kəbájn	Búńǎ kó ʒí kəbájn (bwén) Búńǎ kó ʔlám kəbájn (bwén) Búńǎ kó ʔsəjǎ kəbájn (bwén) Búńǎ kó ʔlè kəbájn (bwén) Búńǎ kó kùmə kəbájn (bwén) Búńǎ kó ʔlìmsə kəbájn (bwén)	Búńǎ kó ʔlám kəbájn Búńǎ kó ʔsəjǎ kəbájn Búńǎ kó ʔlè kəbájn Búńǎ kó kùmə kəbájn Búńǎ kó ʔlìmsə kəbájn	Búńǎ kó ʒí kəbájn lám kəbájn səjǎ kəbájn lè kəbájn kùmə kəbájn lìmsə kəbájn	Bung eats fufu Bung cooks fufu Bung sifts fufu Bung loses fufu Bung touches fufu Bung heats fufu
P0	Búńǎ á ʒí kəbájn Búńǎ á ʔlám kəbájn Búńǎ á ʔsəjǎ kəbájn Búńǎ á ʔlè kəbájn Búńǎ á kùmə kəbájn Búńǎ á ʔlìmsə kəbájn	Búńǎ kó ʔlám kəbájn (bwén) Búńǎ kó ʔsəjǎ kəbájn (bwén) Búńǎ kó ʔlè kəbájn (bwén) Búńǎ kó kùmə kəbájn (bwén) Búńǎ kó ʔlìmsə kəbájn (bwén)	Búńǎ á ʔlám kəbájn Búńǎ á ʔsəjǎ kəbájn Búńǎ á ʔlè kəbájn Búńǎ á kùmə kəbájn Búńǎ á ʔlìmsə kəbájn	Búńǎ kó ʒí kəbájn lám kəbájn səjǎ kəbájn lè kəbájn kùmə kəbájn lìmsə kəbájn	Bung will eat fufu Bung will cook fufu Bung will sift fufu Bung will lose fufu Bung will touch fufu Bung will heat fufu
F1	Búńǎ né ʒí kəbájn Búńǎ né ʔlám kəbájn Búńǎ né ʔsəjǎ kəbájn Búńǎ né ʔlè kəbájn Búńǎ né kùmə kəbájn Búńǎ né ʔlìmsə kəbájn	Búńǎ kó ʔlám kəbájn (bwén) Búńǎ kó ʔsəjǎ kəbájn (bwén) Búńǎ kó ʔlè kəbájn (bwén) Búńǎ kó kùmə kəbájn (bwén) Búńǎ kó ʔlìmsə kəbájn (bwén)	Búńǎ né ʔlám kəbájn Búńǎ né ʔsəjǎ kəbájn Búńǎ né ʔlè kəbájn Búńǎ né kùmə kəbájn Búńǎ né ʔlìmsə kəbájn	Búńǎ né ʒí kəbájn né lám kəbájn né səjǎ kəbájn né lè kəbájn né kùmə kəbájn né lìmsə kəbájn	Bung will eat fufu Bung will cook fufu Bung will sift fufu Bung will lose fufu Bung will touch fufu Bung will heat fufu
F2	Búńǎ lú ʒí kəbájn Búńǎ lú ʔlám kəbájn Búńǎ lú ʔsəjǎ kəbájn Búńǎ lú ʔlè kəbájn Búńǎ lú kùmə kəbájn Búńǎ lú ʔlìmsə kəbájn	Búńǎ kó ʔlám kəbájn (bwén) Búńǎ kó ʔsəjǎ kəbájn (bwén) Búńǎ kó ʔlè kəbájn (bwén) Búńǎ kó kùmə kəbájn (bwén) Búńǎ kó ʔlìmsə kəbájn (bwén)	Búńǎ lú ʔlám kəbájn Búńǎ lú ʔsəjǎ kəbájn Búńǎ lú ʔlè kəbájn Búńǎ lú kùmə kəbájn Búńǎ lú ʔlìmsə kəbájn	Búńǎ lú ʒí kəbájn lú lám kəbájn lú səjǎ kəbájn lú lè kəbájn lú kùmə kəbájn lú lìmsə kəbájn	Bung will eat fufu Bung will cook fufu Bung will sift fufu Bung will lose fufu Bung will touch fufu Bung will heat fufu
F3	Búńǎ ʔlám kəbájn Búńǎ ʔsəjǎ kəbájn Búńǎ ʔlè kəbájn Búńǎ kùmə kəbájn Búńǎ ʔlìmsə kəbájn	Búńǎ kó ʔlám kəbájn (bwén) Búńǎ kó ʔsəjǎ kəbájn (bwén) Búńǎ kó ʔlè kəbájn (bwén) Búńǎ kó kùmə kəbájn (bwén) Búńǎ kó ʔlìmsə kəbájn (bwén)	Búńǎ lú ʔlám kəbájn Búńǎ lú ʔsəjǎ kəbájn Búńǎ lú ʔlè kəbájn Búńǎ lú kùmə kəbájn Búńǎ lú ʔlìmsə kəbájn	Búńǎ ʔlám kəbájn ʔlám kəbájn səjǎ kəbájn lè kəbájn kùmə kəbájn lìmsə kəbájn	Bung will eat fufu Bung will cook fufu Bung will sift fufu Bung will lose fufu Bung will touch fufu Bung will heat fufu

5. Verb tone

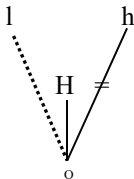
5.1. Downstep. Downstep is commonly used to describe the overall ‘downtrend’ of pitch in tone languages. Scholars have referred to the phenomenon using different terminologies and Connell (2001) distinguishes between *downdrift*, *downstep*, and *declination*. In this paper downstep is used to refer only to the situation where the second of two high tones in a sequence is realized at a lower level than the first.

In Table 2, one instance where downstep occurs is between the high tone of future tense markers and the immediately following high tone of the verb root (see F1, F2, and F3). In this case, downstep is motivated by the fact that the future tense markers consist of a high tone morpheme plus a final floating low tone as follows: *á`* ‘F1’, *né`* ‘F2’, and *lú`* ‘F3’. In these constructions, the low tone remains floating and rather spreads its low register feature to the following high tone. This is followed by the delinking of that tone’s high register such that the high tone of the verb root is realized on a lower register than the preceding high tone of the tense marker.

The same process also occurs in present and future tense negative forms (P0, F1, F2, F3, F4). The floating low tone of the discontinuous negation marker *kó` ... bwen* behaves in a similar manner, causing downstep of the following high tone. The indication of repeated downstep in the negative future forms shows that the high tones of the tense marker and verb root are downstepped relative to that of the negation marker.

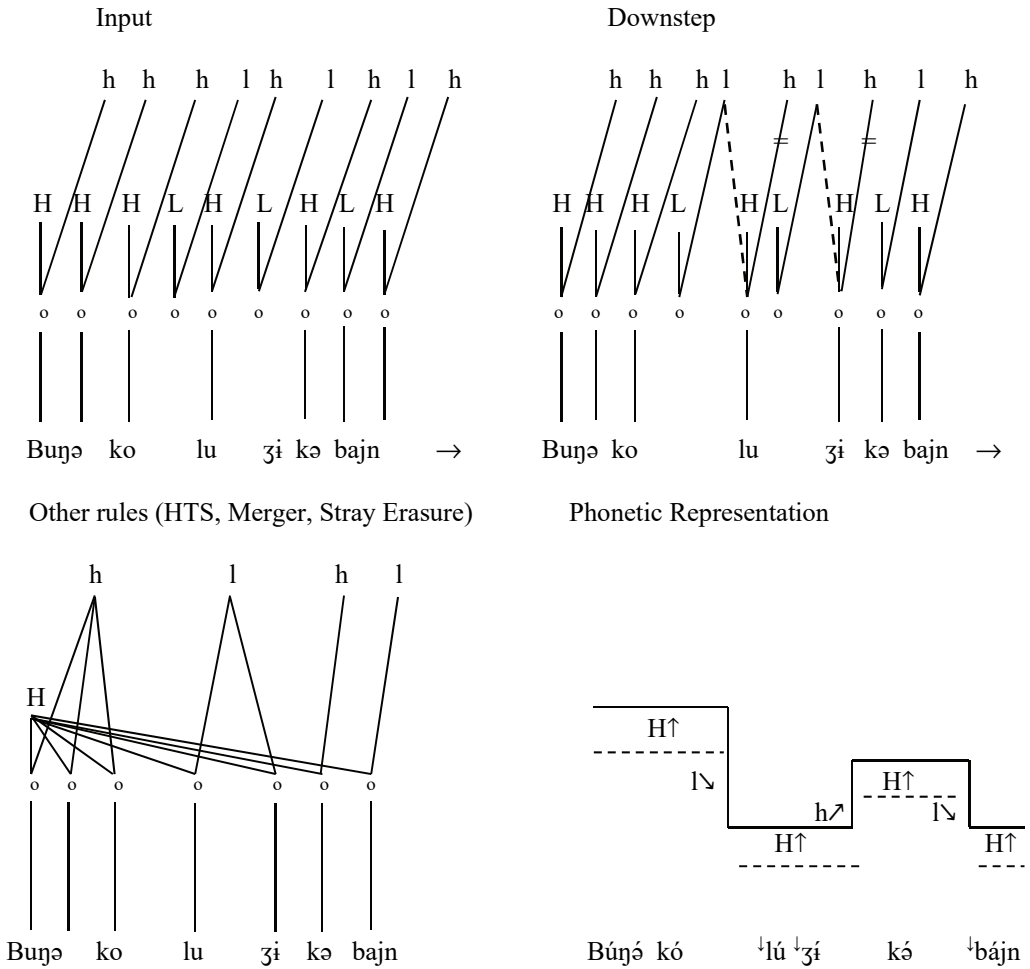
This kind of downstep caused by a floating low tone is commonly known in the literature as non-automatic downstep (Snider 1999) and formalized here in RTT terms as follows.

(5) Downstep



According to this rule, a floating low register feature spreads rightward, and, in a subsequent process, delinks the following high register feature, causing the high tone to be realized on a lower register (downstep), illustrated in the following derivation. In this and other derivations in this paper, the arrows next to the register features illustrate the shift in register, $l \searrow$ = downward and $h \nearrow$ = upward.

Figure 3: Downstep



After *l* spread and *h* delink that result in a downstep, *HTS* (discussed in §5.3) causes the high tone of the verb [ʒí] to spread to the prefix of the following noun such that the prefix which has a low tone underlyingly surfaces on a high tone. *Merger* then coalesces identical adjacent features and *stray erasure* deletes all unassociated (i.e., floating) elements. The last diagram in the derivation shows that the first three high tones are realized on a high register after which there is a register shift downwards such that the fourth and fifth high tones are realized on a low register. The register again moves upward and the sixth high tone is realized on a high register. Finally, the register is lowered and the last high tone is realized on a low register.

Downstep of the noun root high tone is explained in §5.4. Further evidence for downstep is provided by infinitive forms in the language. Akumbu & Fogwe (2012) argue that the infinitive is marked by a high tone schwa but downstep provides evidence for the modification of that claim. It shows that in addition to the high tone schwa there is a floating low tone at the end of infinitive forms (ɛ́). When the high tone schwa and the floating low tone combine with low tone roots (6a), the floating tone merges with the low tone of the root but if they are attached to high tone verb

roots (6b), the floating low tone causes the high tone of the verb to be realized at a lower level than the infinitive high tone.

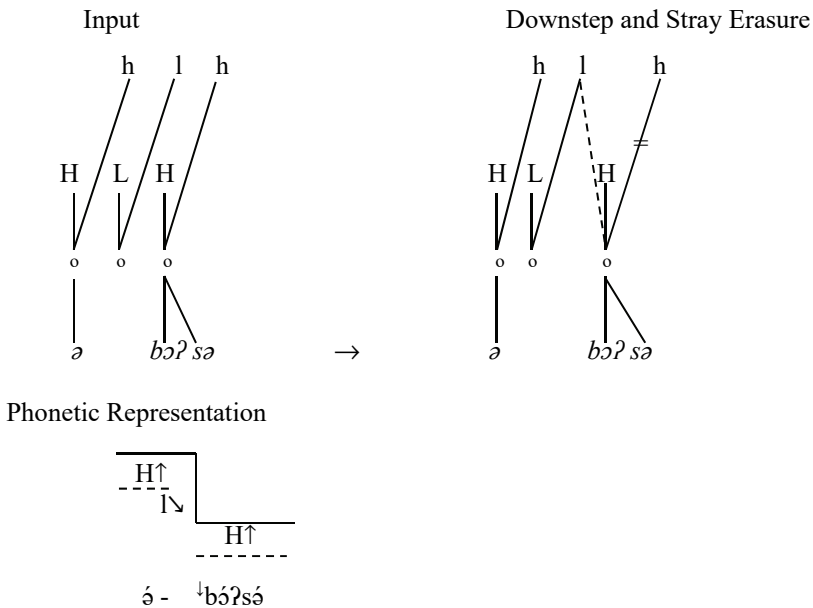
(6) a.	á-kù	[á-kù]	‘to snore’	b.	á-kú	[á- [↓] kú]	‘to give’
	á-mò	[á-mò]	‘to narrate’		á-mó	[á- [↓] mó]	‘to deny’
	á-sám	[á-sám]	‘to swim’		á-sám	[á- [↓] sám]	‘to migrate’
	á-bòʔtə	[á-bòʔtə]	‘to open’		á-bóʔsə	[á- [↓] bóʔsə]	‘to join’
	á-fisə	[á-fisə]	‘to remove’		á- [↓] fíʔsə	[á- [↓] fíʔsə]	‘to put down’
	á-bàŋlə	[á-bàŋlə]	‘to pretend’		á-láŋtə	[á- [↓] láŋtə]	‘to bend down’

Wherever a verb is used in the infinitive form, downstep occurs as shown in (7).

(7) a.	átfò fá ŋgəŋ	‘to pass through the residence’
	á [↓] kú? á fə́kəʔ	‘to climb on a tree’
b.	wù jì tʃən átʃò	‘you refused to pass’
	wù jì tʃən á [↓] kú?	‘you refused to climb’
c.	wũ t̄ə tʃò	‘you passed’
	wũ t̄ə kú?	‘you climbed’

The data in (7a and b) show that there is always downstep of the high tone of the root when the infinitive form of the verb is used. This is confirmed by the forms in (7c) where there is no infinitive marker and no downstep. High tone infinitive verbs can be derived as in Figure 4.

Figure 4: Downstep in infinitives



The derivation shows that the floating low register feature of the infinitive spreads to and delinks the following high register feature of the root high tone causing it to be realized on a low register.

5.2. Tone docking (TD). Underlying floating tones dock leftward in at least the negative, imperative and imperfective forms, while tone docking to the right occurs in the imperative and imperfective. It has been mentioned above that the floating low negation tone causes downstep of the following high tone. This happens only when the low tone fails to dock leftward in future tense constructions. Generally, the floating negation tone docks leftward onto the first negation morpheme, as shown in the following data.

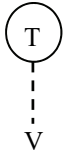
- (8) a. *Búŋá kô zì ká¹bájn* (bwén)
 Búŋ á kó ` zì kà.bájn bwen⁴
 Bung SM NEG eat C7.fufu NEG
 ‘Bung has not eaten fufu.’
- b. *Búŋá kô jì zì ká¹bájn* (bwén)
 Búŋ á kó ` jì zì kà.bájn bwen
 Bung SM NEG P2 sift C7.fufu NEG
 ‘Bung did not eat fufu.’
- c. *Búŋá kô t̀ zì ká¹bájn* (bwén)
 Búŋ á kó ` t̀ zì kà.bájn bwen
 Bung SM NEG P3 sift C7.fufu NEG
 ‘Bung did not eat fufu.’
- d. *Búŋá kô nzi ká¹bájn* (bwén)
 Búŋ á kó ` N⁵-zì kà.bájn bwen
 Bung SM NEG N-eat C7.fufu NEG
 ‘Bung did not eat fufu.’

The examples illustrate that in all past tenses, the first negation morpheme is high-falling due to the leftward docking of the floating low tone. Tone docking is formalised in autosegmental terms as follows:

⁴ *bwen* ‘NEG’ has been represented underlyingly without a tone mark because it seems that it can be realized on either a high or a low tone. What determines the choice is not clear yet and remains a point to be investigated.

⁵ The nasal has simply been glossed ‘N’ because its origin and function remain unclear not only in Babanki but also in Kom (Shultz, 1997) and Bafut (Tamanji, 2009) where it has been analysed as induced by the verb or as an aspect marker respectively.

(9) Tone Docking



According to this rule a floating tone docks onto a TBU which may be either to the left or right. In (8), docking is leftward and results in a contour tone, as shown in the following derivation.

(10)	<i>Búŋá kô jì zì ká[↓]bájn (bwén)</i>	<i>Búŋá kô nzi ká[↓]bájn (bwén)</i>
Input	/Búŋ á kó ` jì zì kàbájn bwen/	Búŋ á kó ` N-zì kàbájn bwen/
TD	Búŋ á kô jì zì kàbájn bwen	Búŋ á kô N-zì kàbájn bwen
Other rules	Búŋá kô jì zì ká [↓] bájn bwén	Búŋá kô nzi ká [↓] bájn bwén
PR	[<i>Búŋá kô jì zì ká[↓]bájn (bwén)</i>]	[<i>Búŋá kô nzi ká[↓]bájn (bwén)</i>]

Imperative (IMP) forms also undergo tone docking albeit bidirectionally. IMP is marked by a floating high tone found immediately after the verb root. It docks leftward to form a LH melody when the verb tone is low or merges with the high tone if the verb tone is high.⁶ At the same time, docking occurs to the right on condition that the following noun has a class marker (prefix). The following data show TD in the imperative when the subject is singular.

(11) a.	<i>zì ká[↓]bájn</i>	b.	<i>lám ká[↓]bájn</i>
	zì kà.bájn		lám kà.bájn
	eat IMP C7.fufu		cook IMP C7.fufu
	‘Eat fufu!’		‘Cook fufu!’
c.	<i>lè ká[↓]bájn</i>	d.	<i>kùm ká[↓]bájn</i>
	lè kà.bájn		kùm kà.bájn
	lose IMP C7.fufu		touch IMP C7.fufu
	‘Lose fufu!’		‘Touch fufu!’
e.	<i>lìmsá ká[↓]bájn</i>	f.	<i>lám wùwì</i>
	lìmsà kà.bájn		lám wùwì
	heat IMP C7.fufu		marry IMP C1.woman
	‘Heat fufu!’		‘Marry a woman!’

⁶ A similar situation is reported in another Northwestern Grassfields language, Moghamo, where the imperative marker is also a floating high tone that associates in various ways depending on the verb stem (Achiri-Taboh, 2013).

- g. *fisə̀ nàm*
 fisə̀ nàm
 remove IMP C9.meat
 ‘Remove meat!’

The IMP high tone consistently docks leftward onto the verb but docks rightward only onto noun class prefixes. The examples in (11c and d) show that when low tone verb roots have only one syllable a schwa is inserted to bear the imperative tone (discussed in §5.5) and avoid a rising tone on a single TBU. (11e and g) show that the floating imperative high tone replaces the low tone of the second syllable of two-syllable low tone roots. In (11f and g) the IMP tone does not dock rightward because the nouns do not have prefixes. Imperative forms are derived as follows:

- | | | |
|-------------|--------------------|-----------------------|
| (12) | <i>lám kə̀bájn</i> | <i>lìmsə̀ kə̀bájn</i> |
| Input | /lám kə̀bájn | lìmsə̀ kə̀bájn/ |
| TD | lám kə̀bájn | lìmsə̀ kə̀bájn |
| Other rules | lám kə̀bájn | lìmsə̀ kə̀bájn |
| PR | [lám kə̀bájn | lìmsə̀ kə̀bájn] |

Future affirmative and negative (imperfective) constructions also undergo TD, as illustrated by the following F2 forms. Notice that there is a floating high tone after the verb root that marks imperfective⁷ (IPF) aspect.

- | | | | |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------|
| (13) a. | <i>Búŋ ə̀ né lám kə̀bájn</i>
Búŋ ə̀ né lám kə̀bájn
Bung SMF2 cook IPF C7.fufu
‘Bung will cook fufu.’ | b. | <i>Búŋ ə̀ né sə̀ŋtə̀ kə̀bájn</i>
Búŋ ə̀ né sə̀ŋtə̀ kə̀bájn
Bung SMF2 sift IPF C7.fufu
‘Bung will sift fufu.’ |
| c. | <i>Búŋ ə̀ né kùm kə̀bájn</i>
Búŋ ə̀ né kùm kə̀bájn
Bung SMF2 touch IPF C7.fufu
‘Bung will touch fufu.’ | d. | <i>Búŋ ə̀ né kùmsə̀ kə̀bájn</i>
Búŋ ə̀ né kùmsə̀ kə̀bájn
Bung SMF2 touch-EXT IPF C7.fufu
‘Bung will touch fufu.’ |
| e. | <i>Búŋ ə̀ né lìmsə̀ kə̀bájn</i>
Búŋ ə̀ né lìmsə̀ kə̀bájn
Bung SMF2 heat IPF C7.fufu
‘Bung will heat fufu.’ | f. | <i>Búŋ ə̀ kó né kùm kə̀bájn</i>
Búŋ ə̀ kó né kùm kə̀bájn
Bung SMNEG F2 touch IPF C7.fufu
‘Bung will not touch fufu.’ |
| g. | <i>Búŋ ə̀ kó né kùmsə̀ kə̀bájn</i>
Búŋ ə̀ kó né kùmsə̀ kə̀bájn
Bung SMNEG F2 touch-EXT IPF C7.fufu
‘Bung will not touch fufu.’ | h. | <i>Búŋ ə̀ kó né lìmsə̀ kə̀bájn</i>
Búŋ ə̀ kó né lìmsə̀ kə̀bájn
Bung SMNEG F2 heat IPF C7.fufu
‘Bung will not heat fufu.’ |

⁷ *Imperfective aspect* is used in Babanki to represent events as occurring “over a longer or undefined period” (Nurse, 2003).

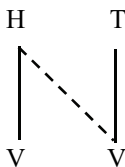
The floating IPF high tone, like the imperative high tone, also docks both leftward and rightward. Two-syllable low tone verbs surface with LH on the second syllable (13d, e, g and h), providing support for leftward docking whereas one-syllable low tone verbs show no trace of the floating high tone on the verb (13c and f) suggesting that the IPF tone docks only if the preceding verb has an extension attached to it. A comparison of (13f and g) in particular reveals that leftward docking of the IPF tone occurs only if the verb takes an extension. The fact that the following noun prefix also surfaces on a high tone shows that the floating IPF tone also docks rightward. The way the verb root and the following object relate is discussed briefly in §6.4.

5.3. High tone spread (HTS). High tone spread is also common in the Babanki verb system and accounts for the underlying L(L) roots that surface as HL in some constructions. A close look at Table 2 reveals that HTS occurs in all the tenses in at least one type of construction. Consider the following data with their underlying forms for illustration.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(14) a. <i>Búŋá jì zì kà[↓]bájŋ</i>
 Búŋ á jì zì kà.bájŋ
 Bung SMP2 eat C7.fufu
 ‘Bung ate fufu.’</p> | <p>b. <i>Búŋá kúmà lí kà[↓]bájŋ</i>
 Búŋ á kúm lí` kà.bájŋ
 Bung SM touch P1 C7.fufu
 ‘Bung has touched fufu.’</p> |
| <p>c. <i>Búŋá n-lìmsà lí kà[↓]bájŋ</i>
 Búŋ á n-lìmsà lí` kà.bájŋ
 Bung SMN-heat P4 C7.fufu
 ‘Bung heated fufu.’</p> | <p>d. <i>zì kà[↓]bájŋ</i>
 zì` kà.bájŋ
 eat IMP C7.fufu
 ‘Eat fufu!’</p> |

HTS occurs from the SM to the tense marker in (14a), from the SM to the verb root in (14b and c), and from the verb root to the noun prefix in (a). HTS creates a contour tone on the tense marker in (a) but not in the rest of the contexts. In (b and c) it is followed by the delinking of the root low tone. The delinked tone merges with the schwa of the second syllable roots (c) while in (b), a schwa is inserted to bear the delinked root tone, as discussed in section (4.5). HTS to the noun prefix is blocked in (b and c) by the floating low tone of P1 and P4. In (a) the underlying high tone of the verb root is delinked, following Low Tone Spread discussed below in section 4.4. Due to schwa insertion in (b) both one-syllable and two-syllable low tone roots surface with an identical HL melody on two syllables, thereby neutralising the distinction between the two syllable types of verbs in this context. High Tone Spread is formalized as follows:

- (15) High Tone Spread



According to this rule an associated high tone spreads to the tone bearing unit to its right. HTS can be followed by other rules as described above and illustrated in the following derivation.

(16)	Búŋó nlímsè lí kàbájn	Búŋó jì zì ká [↓] bájn
Input	/Búŋ ó N-límsè lí ` kàbájn	Búŋ ó jì zì kàbájn/
TD		
HTS	Búŋ ó N-lí `msè lí ` kàbájn	Búŋ ó jí ` zì ká [↓] `bájn
Other rules	Búŋ ó n-límsè lí kàbájn	Búŋ ó jì zì ká [↓] bájn
PR	[Búŋó nlímsè lí kàbájn	Búŋó jì zì ká [↓] bájn]

Notice in Table 2 that past progressive forms do not undergo HTS, mainly because the SM from where HTS originates is not present⁸ (P2, and P3) or rather has a low tone (P4). In P2 and P3, the SM does not occur when the subject is from classes 1, 6a, and 9. In P4, the schwa is retained but surprisingly it carries a low tone. This is probably due to the fact that classes 1, 6a, and 9 typically utilize low tones to mark agreement in Babanki, as in the associative construction (Akumbu 2011). How this is related to past progressive constructions remains unclear and requires further investigation.

5.4. Low tone spread (LTS). Low tone spread occurs in P2 and P3 affirmative constructions as well as in all past tense negative forms where the low tone that precedes the verb root spreads to and delinks the high tone of the verb or merges with the verb low tone. In P4 negative forms in Table 2, LTS originates from the floating low tone of the negation marker while in the rest of the constructions it is from the tense marker. The following data illustrate this process.

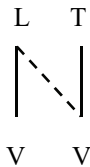
- (17)a. *Búŋó jì zì ká[↓]bájn*
 Búŋ ó jì zì kà.bájn
 Bung SMP2 eat C7.fufu
 ‘Bung ate fufu.’
- b. *Búŋó t̂ l̂m ká[↓]bájn*
 Búŋ ó t̂ l̂m kà.bájn
 Bung SMP3 cook C7.fufu
 ‘Bung cooked fufu?’
- c. *Búŋó kó zì ká[↓]bájn (bwén)*
 Búŋ ó kó ` zì kà.bájn bwen
 Bung SMNEG eat C7.fufu NEG
 ‘Bung has not eaten fufu.’
- d. *Búŋó kó jì ŝŋt̂ kàbájn (bwén)*
 Búŋ ó kó ` jì ŝŋt̂ kà.bájn bwen
 Bung SMNEG P2 sift C7.fufu NEG
 ‘Bung didn’t sift fufu’

⁸ The subject marker (SM) changes depending on the noun class of the noun it represents. It is the same (ó) for classes 1, 2, 3, 5, 6, 6a, 8, and 9 but ká ‘C7’, sá ‘C10’, t̂ ‘C13’, and f̂ ‘C19’.

- e. *Búŋá kô tà lám ká[↓]bájn (bwén)*
 Búŋ á kó ` tà lám kà.bájn bwen
 Bung SMNEG P3 cook C7.fufu NEG
 ‘Bung didn’t cook fufu.’
- f. *Búŋá kô nzi ká[↓]bájn (bwén)*
 Búŋ á kó ` N-zí kà.bájn bwen
 Bung SMNEG N-eat C7.fufu NEG
 ‘Bung didn’t eat fufu.’

The data show that underlying H(H) tone verb roots surface as L(H) due to LTS formalized as follows.

(18) Low Tone Spread



According to this rule an associated low tone spreads to the tone bearing unit to its right. LTS can be followed by other rules as illustrated in the following derivation.

(19)	<i>Búŋá jî zì ká[↓]bájn</i>	<i>Búŋá kô nzi ká[↓]bájn (bwén)</i>
Input	/Búŋ á jì zì kà.bájn	Búŋ á kó ` N-zí kà.bájn bwen/
TD		Búŋ á kô N-zí kà.bájn bwen
LTS and delinking	Búŋ á jì zì ` kàbájn	Búŋ á kô N-zí ` kàbájn bwen
HTS/docking & delinking	Búŋ á jî zì ká `bájn	Búŋ á kô N-zì ká `bájn bwen
Other rules	Búŋ á jî zì ká [↓] bájn	Búŋ á kô n-zì ká [↓] bájn bwen
PR	[Búŋá jî zì ká [↓] bájn	Búŋá kô nzi ká [↓] bájn bwén]

One wonders why rising tones sometimes survive in the language and sometimes do not. Recall that a Low root followed by a High floating tone gives LH (e.g. *kù má ká[↓]bájn* ‘touch fufu’) but a verb like *zì* ‘eat’ undergoes LTS and instead of keeping the LH, it rather simplifies to L, with the H being realized on the prefix of the following noun when an object follows. In addition, the way the tone of the object is affected depends on the underlying tone pattern of the noun (Hyman 1979:162).

- (20) a. *Búŋá jî yà? kákòs*
 Búŋ á jì yá? kà.kòs
 Bung SMP2 catch C7.slave
 ‘Bung caught a slave.’
- b. *Búŋá jî yà? ká[↓]bájn*
 Búŋ á jì yá? kà.bájn
 Bung SMP2 catch C7.fufu
 ‘Bung caught fufu.’

- c. *Búḡá jì yà? dzém*
 Búḡ á jì yá? dzém^o
 Bung SMP2 catch C9.back
 ‘Bung caught a back.’
- d. *Búḡá jì yà? kàmbò°*
 Búḡ á jì yá? kà.mbò^o
 Bung SMP2 catch C7.bag
 ‘Bung caught a bag.’
- e. *Búḡá jì yà? nàm*
 Búḡ á jì yá? nàm
 Bung SMP2 catch C9.animal
 ‘Bung caught an animal.’
- f. *Búḡá jì yà? bú*
 Búḡ á jì yá? bú
 Bung SMP2 catch C9.dog
 ‘Bung caught a dog.’
- g. *Búḡá jì yà? mú^lú*
 Búḡ á jì yá? mú^lú
 Bung SMP2 catch C6a.water
 ‘Bung caught water.’

The data show that after LTS the high tone from the verb affects the tone of the object in different ways as follows: underlying L-L nouns are realized as H-L (a), L-H as H^lH (b), and L^{o9} as HL (c), while the rest do not change.

It should also be mentioned that pronouns and prepositional phrases that follow the verb can also be affected in various ways, as shown in the data below.

- (21) a. *Búḡá jì yà? wù*
 Búḡ á jì yá? wù
 Bung SMP2 catch 2s
 ‘Bung caught you.’
- b. *Búḡá jì yà? vówé*
 Búḡ á jì yá? vòwé
 Bung SMP2 catch 3p
 ‘Bung caught them.’
- c. *Búḡá jì yà? jés*
 Búḡ á jì yá? jès
 Bung SMP2 catch 1p
 ‘Bung caught us.’
- d. *Búḡá jì yà? á ḡḡàḡ*
 Búḡ á jì yá? á ḡḡàḡ
 Bung SMP2 catch PREP c9.house
 ‘Bung caught in the house.’
- e. *Búḡá jì yà? nà kàvú ká wén*
 Búḡ á jì yá? nà kà.vú ká wén
 Bung SMP2 catch PREP c7.hand AM 3s
 ‘Bung caught with his hand.’

The delinked high tone of the verb surfaces on the first syllable of two-syllable pronouns (b and c) but not on one-syllable low tone pronouns (a) or preposition (e). Interestingly, LTS fails to apply if nothing follows the verb.

⁹ The small ‘o’ after ‘L’ indicates that the low tone is floating.

- (22) a. *Búṅá jì zí*
 Búṅ ó jì zí
 Bung SMP2 eat
 ‘Bung ate.’
- b. *Búṅá t̄ám*
 Búṅ ó t̄ám
 Bung SMP3 cook
 ‘Bung cooked.’
- c. *Búṅá kó zí*
 Búṅ ó kó zí
 Bung SM NEG eat
 ‘Bung has not eaten.’

5.5 Schwa Insertion (SI). It has already been mentioned that a schwa can be inserted to bear certain tones such as the floating imperative tone (sections 4.2 and 4.3). The insertion of this mid-central low vowel whenever the need for a vowel arises is possible evidence that the schwa is the default vowel in Babanki. The following examples show schwa insertion.

- (23) a. *lèá k̄ábájn*
 lè á k̄á.bájn
 lose IMP C7.fufu
 ‘Lose fufu!’
- b. *Búṅá kùm lí k̄ábájn*
 Búṅ ó kùm lí k̄á.bájn
 Bung SM touch P1 C7.fufu
 ‘Bung has touched fufu.’
- c. *Búṅá lámá k̄ábájn*
 Búṅ ó lám á k̄á.bájn
 Bung SM cook PROG C7.fufu
 ‘Bung is cooking fufu.’
- d. *Búṅá kùm k̄ábájn*
 Búṅ ó kùm k̄á.bájn
 Bung SM touch PROG C7.fufu
 ‘Bung is touching fufu.’
- e. *Búṅá s̄ájt̄á k̄ábájn*
 Búṅ ó s̄ájt̄á k̄á.bájn
 Bung SM sift PROG C7.fufu
 ‘Bung is sifting fufu.’

The schwa is inserted in (a) to bear the high tone of the imperative. In (b) it is inserted to bear the delinked low tone that results from HTS from the SM to the verb root and subsequent deletion of that verb tone. In (c and d) schwa insertion is required so that it can bear the low tone of the progressive (PROG) marker. PROG is marked by a floating low tone which is found after the verb root. This is contrary to Akumbu & Fogwe (2012) who claim that PROG is marked by a toneless schwa. Instead, the schwa bears a high tone in (c), due to HTS from the verb root that results in the delinking of the progressive low tone. Interestingly two-syllable high tone roots that end in a schwa (e) are affected differently as the second high tone is replaced by the low tone of the progressive. For this reason some HH verb roots surface as HL.

Schwa insertion could suggest that historically Babanki verb roots were disyllabic and the final syllable has been lost over time. The schwa is therefore a trace of that final vowel which is realized only under some conditions. Further evidence for disyllabic roots in Babanki comes from plural subject pronouns where traces of two or three syllables still survive in such alternations as:

- (24) $\nu\acute{\alpha}\gamma\acute{\alpha}\eta\acute{\alpha} \sim \nu\acute{\alpha}\gamma\acute{\alpha}\eta \sim \nu\acute{\alpha}\gamma\acute{\alpha}$ ‘1p (inclusive)’
 $j\acute{e}s\acute{\alpha} \sim j\acute{e}s \sim j\acute{e}$ ‘1p (inclusive)’
 $\gamma\acute{\alpha}\eta\acute{\alpha} \sim \gamma\acute{\alpha}\eta \sim \gamma\acute{\alpha}$ ‘2p’
 $\nu\grave{\alpha}\omega\acute{e}\nu\acute{\alpha} \sim \nu\grave{\alpha}\omega\acute{e} \sim \nu\acute{\alpha}$ ‘3p’

Each of the pronouns can be used in any of the three ways with the general tendency being to use the most simplified version except where there are restrictions. The presence of the schwa on the second or third syllable provides justification for schwa insertion.

6. Verb reduplication tone

The way tones behave when verbs are reduplicated depends on the verb group. Sometimes within the same group, reduplication patterns differently depending on the syllable structure of the verb.

6.1. High tone verbs. High tone verbs exhibit both total (morphological completeness) and partial (tonal difference) reduplication. In the following table one-syllable high tone verbs are shown in their base and reduplicated forms.

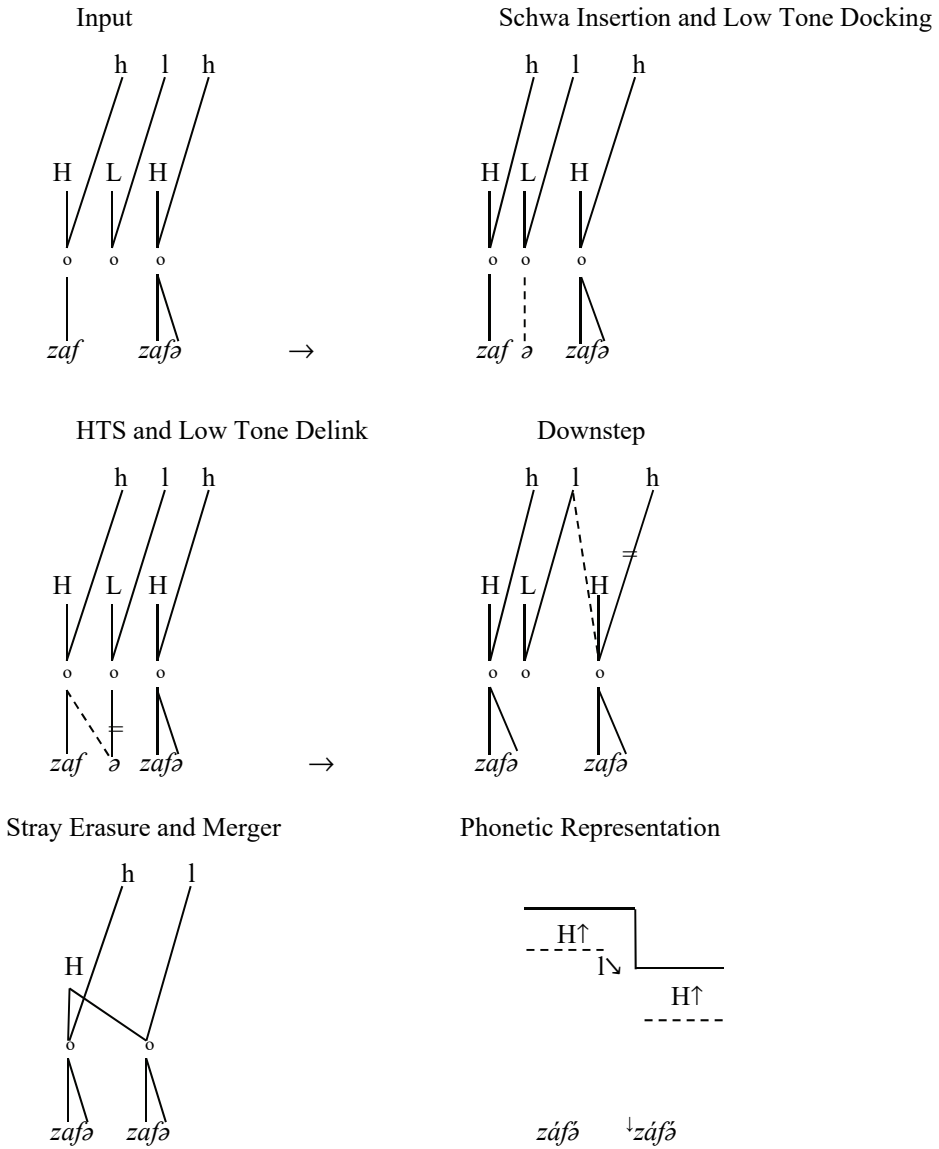
Table 3: One-syllable high tone root reduplication

Infinitive	Reduplicated Infinitive	Imperative	Reduplicated Imperative	Reduplicated progressive	gloss
$\acute{\alpha}\text{-}\downarrow\text{t}\acute{\epsilon}$	$\acute{\alpha}\text{-}\downarrow\text{t}\acute{\epsilon}\text{t}\acute{\epsilon}$	té	tétéá	téá \downarrow téá	‘insult’
$\acute{\alpha}\text{-}\downarrow\text{b}\text{w}\acute{\text{i}}$	$\acute{\alpha}\text{-}\downarrow\text{b}\text{w}\acute{\text{i}}\text{b}\text{w}\acute{\text{i}}$	bwí	bwíbwíá	bwíá \downarrow bwíá	‘give birth’
$\acute{\alpha}\text{-}\downarrow\text{z}\acute{\text{á}}\text{f}$	$\acute{\alpha}\text{-}\downarrow\text{z}\acute{\text{á}}\text{f}\text{z}\acute{\text{á}}\text{f}\acute{\text{ɔ}}$	záf	záfzáf $\acute{\text{ɔ}}$	záf $\acute{\text{ɔ}}$ \downarrow záf $\acute{\text{ɔ}}$	‘ache’
$\acute{\alpha}\text{-}\downarrow\text{z}\acute{\text{i}}\text{m}$	$\acute{\alpha}\text{-}\downarrow\text{z}\acute{\text{i}}\text{m}\text{z}\acute{\text{i}}\text{m}\acute{\text{ɔ}}$	zím	zímzím $\acute{\text{ɔ}}$	zím $\acute{\text{ɔ}}$ \downarrow zím $\acute{\text{ɔ}}$	‘sing’
$\acute{\alpha}\text{-}\downarrow\text{b}\text{w}\acute{\text{o}}\text{m}$	$\acute{\alpha}\text{-}\downarrow\text{b}\text{w}\acute{\text{o}}\text{m}\text{b}\text{w}\acute{\text{o}}\text{m}\acute{\text{ɔ}}$	bwóm	bwómbwóm $\acute{\text{ɔ}}$	bwóm $\acute{\text{ɔ}}$ \downarrow bwóm $\acute{\text{ɔ}}$	‘build’

Downstepping of the high tone in the infinitive forms results in the second high tone being lower than the first (see §5.1). Reduplication of the imperative forms shows that there is a high tone reduplicant (RED)¹⁰ morpheme ($\acute{\alpha}$) that is added at the end of the reduplicated form (see especially the reduplicated CVC roots). It also shows that the tones and segments of the base are identical to those of the RED. In the reduplicated progressive forms the RED morpheme surfaces on the RED and a schwa is inserted after the base to bear the progressive low tone. The progressive tone is eventually replaced by the high tone of the root as described in §5.5. Downstep of the RED tone is caused by the progressive low tone that floats after the application of HTS as illustrated in the following RTT derivation.

¹⁰ The *reduplicant* is an affix onto which features or segments of the morphological base are copied while the *base* refers to the verb or part of it that is to be copied.

Figure 5: Downstep in reduplicated forms



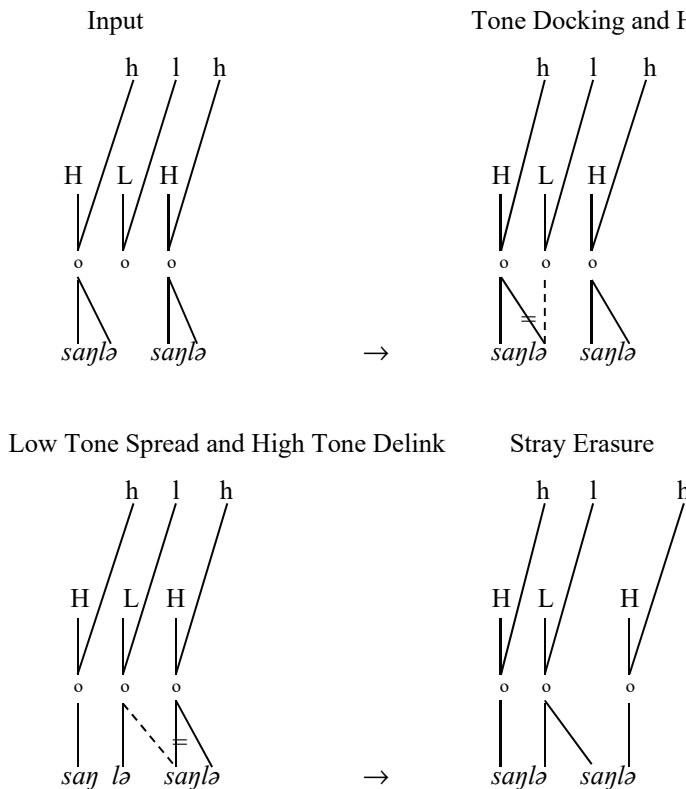
The derivation shows that the first high tone is realized on a high register and the second on a low register. Next, consider the two-syllable high tone verbs in Table 4.

Table 4: Two-syllable high tone root reduplication

Infinitive	Reduplicated Infinitive	Imperative	Reduplicated Imperative	Reduplicated progressive	gloss
á- [↓] sáŋlá	á- [↓] sáŋlósáŋlá	sáŋlá	sáŋlósáŋlá	sáŋlósàŋlá	'rejoice'
á- [↓] báʔtá	á- [↓] báʔtábáʔtá	báʔtá	báʔtábáʔtá	báʔtábàʔtá	'gather'
á- [↓] tímá	á- [↓] tímótímá	tímá	tímótímá	tímètímá	'stand'
á- [↓] bùŋká	á- [↓] bùŋkábùŋká	bùŋká	bùŋkábùŋká	bùŋkàbùŋká	'roll'
á- [↓] sóŋtá	á- [↓] sóŋtásóŋtá	sóŋtá	sóŋtásóŋtá	sóŋtásòŋtá	'sift'

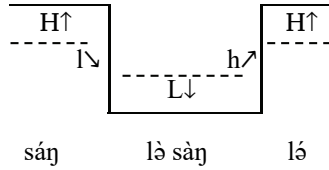
These data further illustrate what happens with one-syllable high tone verbs in forms other than the reduplicated progressive. In these progressive forms, the last tone of the base is low as expected after progressive low tone docking and high tone delinking apply (§5.5). However, the first syllable of the RED unpredictably surfaces as *low* instead of *high*. To explain this it has been assumed that the derived low tone of the base spreads rightward and delinks the first high tone of the RED¹¹, as shown in the following derivation.

Figure 6: Low Tone Spread in reduplicated forms



¹¹ This isolated process requires further investigation as it has been found to occur only in the context of the reduplication of two syllable high tone verbs in the progressive.

(Figure 6 cont.)
Phonetic Representation



The first syllable has a high tone realized on a high register while the second and third syllables have a low tone realized on a low register. The register is again shifted upward for the last syllable and the high tone is realized on a high register.

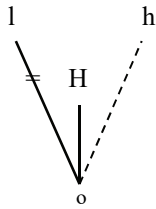
6.2. Low tone verbs. Low tone verbs exhibit only partial reduplication such that segments in the base and reduplicant manifest tonal differences. The reduplication pattern on both one- and two-syllable low tone verbs is shown in the next table. They are put together because tone behaves in a similar manner regardless of the syllable type.

Table 5: Low tone root reduplication

Infinitive	Reduplicated Infinitive	Imperative	Reduplicated Imperative	Reduplicated progressive	gloss
á-tʃò	á-tʃò [↑] tʃò	tʃò	tʃò [↑] tʃò	tʃò [↑] tʃò	‘pass’
á-vì	á-vì [↑] vi	vi	vi [↑] vi	vi [↑] vi	‘come’
á-swè	á-swè [↑] swè	swè	swè [↑] swè	swè [↑] swè	‘miss’
á-kùm	á-kùm [↑] kùm	kùm	kùm [↑] kùm	kùm [↑] kùm	‘touch’
á-mwòm	á-mwòm [↑] mwòm	mwòm	mwòm [↑] mwòm	mwòm [↑] mwòm	‘taste’
á-kùmtà	á-kùmtà [↑] kùmtà	kùmtà	kùmtà [↑] kùmtà	kùmtà [↑] kùmtà	‘reiterate’
á-bìlè	á-bìlè [↑] bìlè	bìlè	bìlè [↑] bìlè	bìlè [↑] bìlè	‘alter’
á-sisè	á-sisè [↑] sisè	sisè	sisè [↑] sisè	sisè [↑] sisè	‘refund’
á-kàŋlè	á-kàŋlè [↑] kàŋlè	kàŋlè	kàŋlè [↑] kàŋlè	kàŋlè [↑] kàŋlè	‘stagger’
á-tàŋkè	á-tàŋkè [↑] tàŋkè	tàŋkè	tàŋkè [↑] tàŋkè	tàŋkè [↑] tàŋkè	‘try’
á-nàʔsè	á-nàʔsè [↑] nàʔsè	nàʔsè	nàʔsè [↑] nàʔsè	nàʔsè [↑] nàʔsè	‘stretch’

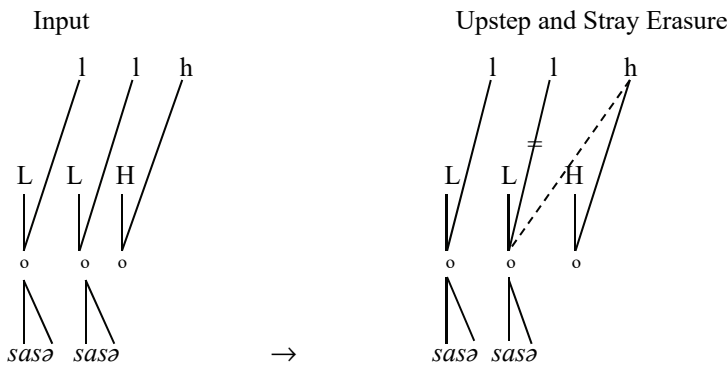
An observation to be made from the table is that the low tone on the RED is upstepped in all instances of reduplication involving low tone roots. The upstepped low tone is like a mid tone, higher than a low tone but lower than a high tone and both low tones following the point of upstep are realized at that same mid level. Upstep is the effect of the RED high tone that fails to surface in the context of low tones. Recall that when high tone roots are reduplicated, a high tone schwa is found at the end of the RED. In the case of low tone roots the presence of that high tone is only realized through the upstepping of the low tones of the RED. This is certainly a phonetic effect of anticipating the presence of the high tone and realizing the low tone on a high register. For this to happen the high register feature of the RED high tone spreads leftward and delinks the low register feature of the RED low tone. Upstep is formalized in RTT terms as follows.

(25) Upstep (in low tone reduplicants)

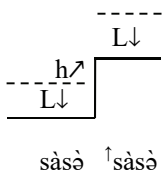


An application of this rule leads to the upstep of low tones of the reduplicant, as shown in the derivation that follows.

Figure 7: Upstep



Phonetic Representation



The first low tone is realized on a low register and the second on a high register due to the upward shift in register caused by leftward *h* register spreading and *l* register delinking.

The imperative forms in Table 5 are regular in that the imperative high tone surfaces on an inserted schwa on one-syllable roots and replaces the low tone of the second syllable in two-syllable roots, as described in §5.2.

7. Conclusion

This paper set out to account for the different surface tonal melodies found on Babanki verbs. In order to accomplish this task, each phonological process that affects the verb system has been discussed. In this regard it has been shown that tone spread is frequent in the language. HTS can be to the verb root or from it and has been used to explain why underlying low tone roots surface with HL and H(H) melodies. LTS can also be from a preceding tense marker to the verb root or

from the verb root, followed by the delinking of the underlying high tone. This process has been used to account for the occurrence of L(H) melodies on underlying high tone verb roots. It has also been observed that a schwa is inserted in many instances to bear a floating tone. It is due to schwa insertion and tone docking that the HH melody is realized as HL. Verbal reduplication is common in the language and equally undergoes the processes described above in addition to low tone upstep that low tone reduplicants undergo.

The use of floating tones to account for tone in the Babanki verb system is in no way surprising in that previous researchers have shown that both lexical and grammatical floating tones are central to the analysis of Grassfields Bantu languages. In this regard Hyman notes,

To account for tone in other Grassfields Bantu 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) (Hyman 1979: 159).

Although their conditions and manner of application may differ, the rules proposed in this paper to account for the verb tone relate to previous rules that apply in the noun system. Both Hyman (1979) and Akumbu (2011) recognize and use HTS, LTS, Downstep, and Upstep, among others to account for tone in the associative construction. It can therefore be concluded that the rules proposed in this paper are plausible and frequently attested in Babanki.

This study complements work on tone in the noun system of Babanki and together they offer a full picture of the tone system of the language. This study also shows that Register Tier Theory allows for an insightful account of assimilation processes, downstep, and upstep which occur in Babanki. Similar studies on the other Centre Ring languages are necessary to provide a complete understanding of their tonal systems and facilitate the reconstruction of Proto-Bantoid tone.

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