Chapter 10

Reconsidering tone and melodies in Kikamba

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The melodic tone system of Kikamba, as described by Roberts-Kohno (2000; 2014), stands out as particularly complex within the context of recent crosslinguistic work on melodic tone in Bantu (Odden & Bickmore 2014; Bickmore 2015). It is unique, for example, in possessing a melody that assigns four distinct tones to three stem-internal positions simultaneously. The apparent existence of such complex melodies raises doubts as to whether there are any substantive restrictions on the possible form of a tonal melody. We argue, however, that these doubts are premature. We propose a new analysis of Kikamba in which (a) melodies refer to no more than two target positions at a time and (b) melodies target only two possible stem-internal positions, each of which occurs commonly within Bantu melodic tone systems. This simplification is achieved by (a) rejecting the existence of a melodic L tone assigned to the penult, and attributing its putative effects to interactions among other, more basic tones, and (b) distinguishing between melodic tones assigned early in the phonological derivation and other suffixal tones added later. In general, we argue that since core properties of melodic tone are often obscured in surface forms due to interactions with language-particular rules, the crosslinguistic comparison of melodic tone should proceed on the basis of a (more) underlying level in which these rules are controlled for. Once this is done, the exceptional properties of Kikamba melodic tone largely disappear.

1 Melodic tone in Bantu and Kikamba

In all Bantu languages that make distinctive use of tone, tonal alternations within the verb stem help to signify various aspects of verbal inflection, including tense, aspect, mood, polarity, clause type, and focus (Odden & Bickmore 2014). In (1) below, we see a clear example of this from Kihunde (Mateene 1992).

(1)   Melodic tone in Kihunde (Mateene 1992)[1]

    a. Infinitive (p. 17)
        i-[king-ul-aɲ-a]
        NC.5-[close-REV-RECP-FV][2]
        'to open each other'

    b. Recent Past (p. 22)
        tw-a-[king-úl-aɲ-a-a]
        1PL.SBJ-PST-[close-REV-RECP-ASP-FV]
        'we opened each other (recently)'

    c. Negative Hypothetical (p. 38)
        tú-ta-[king-úl-aɲ-ir-é]
        1PL.SBJ-NEG-[close-REV-RECP-ASP-FV]
        'if we do not open each other'

In the infinitive form in (1a), the verbal stem is the straightforward sum of its parts: neither the root nor any suffix bears an underlying H tone, so the fact that the stem as a whole surfaces as toneless is unsurprising. However, when the same stem (modulo the inflectional suffixes ASP and FV) appears in the Recent Past form in (1b) or the Negative Hypothetical form in (1c), H tones appear on the stem's second and final vowels (V2 and FV). Logically, since the non-inflectional content of the stem is constant between these forms, the tonal differences between them must somehow arise from differences in inflection. Thus, the tones that appear within the stem in (1b) and (1c) are *grammatical* tones.

Two key questions that arise in the analysis of grammatical tones concern (a) where they come from and (b) how they come to be assigned to their surface positions. Here, for the sake of explicitness, we wish to lay out our own assumptions on these matters clearly at the outset. First, we assume that the stem tone

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[1]The forms here differ from those cited by Mateene in that they contain the reciprocal suffix *−aɲ*; its presence obviates a process of local tone plateauing that would otherwise obscure the basic facts of melodic tone assignment in (1c).

[2]Square brackets in examples and glosses mark verb stem boundaries.

alternations in (1) arise primarily from differences in underlying representation: the URs of (1b) and (1c), but not (1a), contain tonal *melodies* that are exponents of inflection. These melodies consist of one or more *melodic tones*, each of which is labeled with a desired *target*, i.e. a stem-internal position to which it wishes to be assigned. Thus, the Recent Past form in (1b) contains the melody $\{H_{V2}\}$, consisting of a single melodic H tone whose target is V2. The Negative Hypothetical form in (1c) contains the melody $\{H_{V2}+H_{FV}\}$, containing one H that targets V2 and another that targets FV. Finally, we assume that melodic tones are matched with their targets in an early process of *Initial Mapping*, before other tone rules apply. This process may require a negotiation between tones targeting the same vowel (e.g. H_{V2} and L_{FV} in a disyllabic stem), so that perfect mapping of tones to targets is not guaranteed.[3]

In Kihunde, a language with no tone shift and only limited spreading, the target of a melodic tone is generally identical to its surface location. In other languages, operations like shift and spread, applying after initial mapping, can obscure a target's identity. Consider, for example, the Kinande form in (2). This corresponds exactly both in meaning and in segmental makeup with the Kihunde form in (1b), and, like it, its melody $\{H_{V2}+L_{FV}\}$ contains a melodic H that targets V2 (Hyman & Valinande 1985; Jones 2014). However, due to general rules of leftward shift and leftward spread that apply after initial mapping (and which affect underlying tones as well as grammatically-assigned tones) this H surfaces not on V2 but on the first vowel of the stem (V1) and on the first vowel before it (V0).

(2) Recent Past (Kinande)
  tw-á-[kíng-ul-an-a-à]
  1PL.SBJ-PST-[close-REV-RECP-ASP-FV]
  'we opened each other (recently)'

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[3]These assumptions are broadly similar to those adopted, for example, by Bickmore (2007); Ebarb (2016), Marlo (2008; 2009), Marlo (2015), and Odden (2009). One important conceptual difference between our approach and that of the works just cited, however, is our avoidance of construction-specific tone assignment rules. In our view, the task of associating particular tones to particular stem-positions in a tense-dependent way belongs solely to morphology, which associates different tenses with different melodies. The task of the phonology is only to associate the component tones of these morphologically-assigned melodies with their desired targets. One consequence of this is that under our approach, the melody is a single coherent entity at the level of underlying representation, and not simply the sum of all tones assigned by melodic assignment rules.

There is thus a critical distinction between a melodic tone's *surface location* and its *target*: while the former may be directly observed, the latter reveals itself only in the context of analysis.[4]

This issue bears directly on questions of typology. Recent work collected in Odden & Bickmore (2014), as well as antecedent work by Kisseberth & Odden (2003) and Marlo (2013), has considerably extended our knowledge of melodic tone patterns throughout Bantu, to the point that we can now begin to make informed generalizations about (a) what tones may appear in tonal melodies, (b) how many tones a single melody may contain, and (c) what stem-internal positions may serve as targets for melodic assignment. These generalizations, drawn from Odden & Bickmore (2014) and Bickmore (2015), are presented in Table 1.

Table 1: Typological generalizations for melodic tone in Bantu (Odden & Bickmore 2014; Bickmore 2015)

	Common	Exceptional
Melodic tones	H and L	H, L, SH, SL (Kikamba)
		H, L, HL, LH (Bakweri)
Max # of tones per melody	1 or 2	3 (Simakonde: Manus 2014)
		4 (H-L-H-SL in Kikamba)
Targets for melodic tones	V1, V2	V0 (i.e. pre-stem)
	Pen, FV	V3, V4
# of targets per melody	1 or 2	3 (Kikamba)

In the context of the generalizations summarized in Table 1, the melodic tone system reported for Kikamba stands out as uniquely complex. Of all languages surveyed in Odden & Bickmore (2014), it ties with Bakweri (Marlo et al. 2014) in having the largest melodic tone inventory (H, L, SH, and SL), it has the largest number of tones per melody (four), and its melodies target the greatest number of stem positions at a time (three). In addition, it is one of just two languages that are reported to assign a melodic L tone to the penult.

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[4]This point is clearly articulated by Odden & Bickmore (2014: 5): "Ultimately, stem tones will be shaped by the general rules of the language. An in-depth synchronic analysis is thus necessary to strip away these rules, revealing what the specific content of each pattern is, where these tones are associated, and what happens to tones once they are initially associated, not to mention saying when a particular pattern is found".

What are we to make of this? One possibility is that melodic tone in Kikamba is simply an extreme instantiation of a phonological subsystem that has no principled bounds. It is possible, in other words, that any arbitrary combination of melodic tones associated with any arbitrary set of stem positions may constitute a legitimate tonal melody, so we should not be particularly surprised to find complex melodies that assign four distinct tones at once, and to three distinct positions. Indeed, the very existence of such apparently complex melodic patterns seems to suggest that there are few substantive constraints on what a tonal melody can look like.

On the other hand, it is also possible that the considerable (and typologically unusual) degree of complexity reported for Kikamba might give way to a simpler system upon reanalysis. This possibility is especially worth exploring due to the highly indirect relationship between surface tone patterns and underlying melodies discussed above, since this indirect relationship allows the same set of surface facts to submit to a wide range of analytical interpretations.

Here, we pursue this latter possibility and develop a reanalysis of the Kikamba melodic tone system. In this effort, we are relying entirely upon data previously reported by Roberts-Kohno (2000) and Roberts-Kohno (2014). As we will see, upon reanalysis, the melodic system of Kikamba actually deviates very little from the "standard" Bantu melodic tone systems described in Table 1. This finding offers hope that, contrary to what the surface facts of Kikamba might suggest at first, melodic tone is not a purely arbitrary system that can vary without limit. Instead, it is one whose variation is constrained by general principles that careful language-internal and crosslinguistic analysis can reveal.

2 The standard analysis of Kikamba melodies (Roberts-Kohno 2014)

The exceptional properties of the Kikamba tone system reported in §1 emerge from the analysis of Kikamba melodic tone developed by Roberts-Kohno (2000; 2014), briefly summarized in Table 2.[5] This analysis posits ten distinct patterns of

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[5]In all examples from Kikamba, tone is transcribed as follows: high tone is indicated with a single acute accent (e.g. [á]), low tone is indicated with a single grave accent (e.g. [à]), super-high tone is indicated with a doubled acute accent (e.g. [a̋]), and super-low tone is indicated with a doubled grave accent (e.g. [ȁ]), and falling tone (which always results from separate H and L tones assigned to the same vowel) is indicated with a circumflex (e.g. [â]). Vowels that are not marked with any diacritic are phonologically toneless, and are generally pronounced with L tone.

Table 2: Kikamba tone melodies posited by Roberts-Kohno (2000; 2014)

Melody	Example Form
{∅}	o-kaa-[kon-aang-a] '(person) who will hit'
{H$_{V2}$}	tw-aa-[kon-ááng-í-ɛ́] 'we hit (long ago)'
{H$_{FV}$}	to-ǐ-kaa-[kon-aang-á] 'we will not hit'
{H$_{V2}$+L$_{FV}$}	to-[kon-ááng-í-ɛ̀] 'we hit (earlier today)'
{H$_{V2}$+L$_{Pen}$}	o-[kon-ááng-éèt-ɛ] '(person) who's been hitting (today)'
{H$_{V2}$+L$_{Pen}$+H$_{FV}$}	tó-[kon-ááng-ì-ɛ́] '(person) whom we hit (today)'
{SL$_{FV}$}	ko-[kon-aǎng-à] 'to hit'
{H$_{V2}$+H$_{FV}$+SL$_{FV}$}	to-í-[kon-ááng-á-â] 'we do not usually hit'
{H$_{V2}$+L$_{Pen}$+H$_{FV}$+SL$_{FV}$}	to-í-[kon-ááng-éèt-ê] 'we had not hit (long ago)'
{H$_{V2}$+SH$_{FV}$}	tw-áa-[kon-ááng-a̋] 'if/when we hit'

melodic tone assignment, with melodies containing anywhere from zero to four melodic tones.[6]

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[6]To facilitate comparison between stems, the iterative morpheme –*aang* (not consistently present in forms provided by Roberts-Kohno 2014) is included in all forms in Table 2. Here and elsewhere, its meaning of 'here and there/a little bit/randomly' is omitted from glosses to save space.

In this analysis, the relationship between underlying tone melodies and surface tone patterns is entirely straightforward: melodic tones surface on their specified targets, with the minimal complication that H_{V2} spreads rightwards onto all following toneless vowels. This straightforward relationship arises for a simple reason: the analysis posits a distinct underlying melodic tone for every tonal turning point within the stem.

In this paper, we develop a new analysis in which some turning points derive not from the presence of an underlying melodic tone, but rather from *interactions* between a more limited set of tones. Most importantly, we will reject L_{Pen} as a melodic tone, and re-analyze the melodic SL_{FV} tone proposed by Roberts-Kohno as a *non-melodic* floating tone. The end result is an analysis which is somewhat more abstract, but which (a) finds both crosslinguistic and language-internal support and (b) results in a underlying melodic system that is both more internally coherent and more in line with what we should expect in light of the crosslinguistic generalizations about Bantu melodies established in §1.

3 Primary melodies of Kikamba

3.1 Overview

In this section, we consider the melodies described by Roberts-Kohno (2014) that do not involve SL or SH tones. (We discuss those that do involve SL and SH tones in §4.) We show that what Roberts-Kohno (2014) analyzes as 6 arbitrary melodies can be reduced to 5 melodies that form a logically coherent set: three single-tone melodies $\{H_{V2}\}$, $\{H_{FV}\}$ and $\{L_{FV}\}$ and two two-tone melodies representing all the logically possible ways of combining them $\{H_{V2}+H_{FV}\}$ and $\{H_{V2}+L_{FV}\}$. This simplification is made possible primarily by the elimination of L_{Pen} as a possible melodic tone, with its effects attributed instead to general rules and constraints of the language.

3.2 $\{H_{FV}\}$ melody

The most straightforward melody of Kikamba causes a single H tone to surface on the stem's final vowel. This melody is present, for example, in Habitual forms in "Assertive" clauses (i.e. declarative main clauses without object focus). In (3) below, we see such a form in nonfinal position, where it is not affected by the presence of phrasal L tones to be discussed in §4.2. Following Roberts-Kohno (2014), we analyze this melody as $\{H_{FV}\}$.

(3) {H$_{FV}$} melody in Habitual (Assertive, nonfinal)
né-tó-[kon-aang-a-á]　　　…
ASSERT-1PL.SUBJ-[hit-ITER-ASP-FV]
'we always hit'

3.3 {H$_{V2}$} melody

Another straightforward melody causes a H tone span from V2 to FV. This melody
is present, for example, in Remote Perfective forms in Assertive clauses, as in (4)
below. Again following Roberts-Kohno (2014), we analyze this melody as {H$_{V2}$},
consisting of a single melodic H tone attracted to V2. This H is subsequently tar-
geted by a rule of Rightward Spreading, which extends it until the end of the word.
(This rule of unbounded spreading targets only grammatical tones; see Bickmore
(1997; 1999) for discussion of a similar situation in Ekegusii, with accompanying
theoretical analysis.)

(4) {H$_{V2}$} melody in Remote Perfective (Assertive, nonfinal)
né-tw-áa-[kon-ááng-í-ɛ́]　　　…
ASSERT-1PL.SUBJ-PST-[hit-ITER-ASP-FV]
'we hit long ago'

3.4 {H$_{V2}$+H$_{FV}$}

In some forms, such as the Assertive Hodiernal Perfective form in (5), H tones
are assigned to both V2 and FV. In this case, H$_{V2}$ still spreads to the right, but
it stops at the antepenultimate vowel, leaving one L-toned vowel in between
it and H$_{FV}$. Roberts-Kohno (2014) analyzes this L-toned vowel as the result of
L$_{Pen}$, a melodic L tone assigned to the penult. By contrast, we propose that it
results from the Obligatory Contour Principle (OCP): the rightward spread of
H$_{V2}$ is blocked just in case it would cause two distinct H tones to be associated
to adjacent syllables.

(5) {H$_{V2}$+H$_{FV}$} melody in Hodiernal Perfective (Assertive, nonfinal)
né-tó-[kon-ááng-i-ɛ́]　　　…
ASSERT-1PL.SUBJ-[hit-ITER-ASP-FV]
'we hit (earlier today)'

Considerations which favor the OCP-based analysis are (a) the well-document-
ed role of the OCP in stopping tone spread in other Bantu languages (e.g. Myers

1997; Odden 2014) and (b) language-internal symmetry. Since Kikamba melodies independently allow for H_{V2} and H_{FV}, and since Kikamba melodies allow for multiple tones, it is natural to expect a melody that combines them. $\{H_{V2}+H_{FV}\}$ is just this melody. On the other hand, a $\{H_{V2}+L_{Pen}+H_{FV}\}$ is unexpected from the perspective of inventory symmetry and compositionality, since there is no melody in which putative $\{L_{Pen}\}$ is assigned by itself.

3.5 $[H_{V2}+L_{FV}]$

As shown in (6), Kikamba imperatives surface with a H tone on V2 that spreads rightwards only up to the penult, leaving the ultima L-toned. Following Roberts-Kohno (2014), we assume that H cannot spread further onto the ultima because it is blocked by a final melodic L tone. The imperative's melody, therefore, is $\{H_{V2}+L_{FV}\}$.

(6) $\{H_{V2}+L_{FV}\}$ in Imperative forms
      [kon-ááng-éð-í-à]   …
      [hit-ITER-CAUS-CAUS-FV]
      'make (someone) hit!'

However, departing from Roberts-Kohno, we propose that not *all* surface forms that show a H span from V2 to the penult result from a $\{H_{V2}+L_{FV}\}$ melody. In fact, most instances of this pattern have another origin: a $\{H_{V2}+H_{FV}\}$ pattern that is subjected to a rule of *Final Lowering*. We see this, for example, in Hodiernal Perfective forms. When they appear in Assertive or Relative clauses and lack 3rd singular personal agreement morphology, their stems clearly show a $\{H_{V2}+H_{FV}\}$ pattern, as we have already seen in (5) above. However, when the same stems appear in a clause with *object focus*, or with a 3rd singular personal subject marker, the final H tone is lowered to L. These facts are shown in Table 3, where melodies derived from Final Lowering are given in bold.

As an alternative to final lowering, we might instead propose that forms with 3rd singular personal agreement and forms with object focus are simply assigned a variant tone pattern by the morphology.[7] In our view, however, this solution is unsatisfactory because it fails to provide the semantically uniform class of "Hodiernal Perfective" forms with a uniform tone pattern, and also because it fails to explain why the two tone patterns shown by Hodiernal Perfective forms

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[7]This is the solution adopted by Roberts-Kohno (2014), who posits a $\{H_{V2}+L_{Pen}+H_{FV}\}$ pattern for most Hodiernal Perfective forms (as seen in §3.4), but posits a $\{H_{V2}+L_{FV}\}$ pattern for Hodiernal Perfective forms with 3rd singular personal agreement.

Table 3: Final H Lowering in the Hodiernal Perfective

	Assertive (nonfinal)	Relative	Object-Focus
Hodiernal Pfv 'we hit (today)'	[H_{V2}+H_{FV}] né-tó-[kon-ááng-i-ɛ́]	[H_{V2}+H_{FV}] tó-[kon-ááng-i-ɛ́]	**[H_{V2}+L_{FV}]** to-[kon-ááng-í-ɛ̀]
… w/ 3SG subj. 'he hit (today)'	**[H_{V2}+L_{FV}]** n-óo-[kon-ááng-í-ɛ̀]	**[H_{V2}+L_{FV}]** o-[kon-ááng-í-ɛ̀]	**[H_{V2}+L_{FV}]** á-[kon-ááng-í-ɛ̀]

are so similar. Moreover, as we will shortly see, Final Lowering has effects that extend beyond the Hodiernal Perfective forms. We therefore posit the rule of Final Lowering in (7).

(7)   Final Lowering: $H_{FV} \rightarrow L_{FV}$

    a. in object-focus clauses

    b. in forms with 3rd singular personal subject agreement

This rule is admittedly stipulative at the moment. It is not presently clear whether lowering should be induced directly by reference to morphosyntactic features, or indirectly by interactions with tones that these features introduce. (It is tempting, for example, to relate the lowering of H_{FV} in forms with 3rd singular personal subject agreement markers to the fact that these markers systematically differ from others in tone.) More study of this question is needed.

Closely related to the Hodiernal Perfective forms just analyzed are Hodiernal Stative forms that show a H tone span from V2 to the *antepenult*. Roberts-Kohno (2014) analyzes these forms as possessing a distinct {H_{V2}+L_{Pen}} melody, where the presence of a melodic L on the *penult* limits the rightward spread of H to the *antepenult*. However, there are two crucial observations to make of such forms. First, this tone pattern appears to result from Final Lowering, since it occurs in exactly the same contexts where the {H_{V2}+L_{FV}} pattern emerges in the Hodiernal Perfective forms in Table 3. Second, this pattern occurs only in forms with penultimate long vowels introduced by the final suffix sequence *−eet-ɛ*. Both of these points are illustrated in Table 4. (As in Table 3, melodies affected by Final Lowering are given in bold.)

We account for both of these facts by proposing that forms with H spans from V2 to the antepenult underlyingly possess a {H_{V2}+H_{FV}} melody, where (a) H_{FV} is lowered to L_{FV} via Final Lowering (7) and (b) derived L_{FV} spreads to the second mora of a long penult due to a rule of *Long Retraction*, which applies before

Table 4: Tonal variation in Hodiernal Stative Forms

	Assertive (nonfinal)	Relative	Object-Focus
Hod. Stative	$[H_{V2} + H_{FV}]$	$[H_{V2} + H_{FV}]$	$\mathbf{[H_{V2} + L_{FV}]}$
'we have hit'	né-tó-[kon-ááng-éet-έ]	tó-[kon-ááng-éet-έ]	to-[kon-ááng-éèt-ὲ]
... w/ 3sg subj.	$\mathbf{[H_{V2} + L_{FV}]}$	$\mathbf{[H_{V2} + L_{FV}]}$	$\mathbf{[H_{V2} + L_{FV}]}$
'he has hit'	n-óo-[kon-ááng-éèt-ὲ]	o-[kon-ááng-éèt-ὲ]	á-[kon-ááng-éèt-ὲ]

Rightward Spreading extends H_{V2} to the right. Long Retraction is formulated in Figure 1.
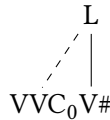

Figure 1: Long Retraction

Note that Long Retraction is independently motivated within Kikamba. Roberts-Kohno (2014) observes that final *super-low* (SL) tones spread onto the second mora of a long penult, exactly as predicted by Long Retraction. Thus, for example, in forms that have a final SL tone, such as infinitives, we see surface contrasts such as *ko-*[*kon-ă*] 'to hit' vs. *ko-*[*kon-aăng-ă*] 'to hit repeatedly.' As discussed in §4, we view SL tones as L tones that are downstepped by a following floating L (cf. Clements & Ford 1981). This allows for a straightforward analysis of final "SL spreading": a final L spreads to the penult via Long Retraction, and this spread L is then downstepped by a following floating L.[8]

Under this analysis, all Hodiernal Stative and Hodiernal Perfective stems share the same underlying melody – $\{H_{V2}+H_{FV}\}$ – but surface with different tone patterns due the varying applicability of Final Lowering and Long Retraction. This analysis is illustrated in the derivations in Table 5. Note that in these derivations, only the stems of verbal forms are shown, so that all forms may be seen side by side.

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[8]As a reviewer notes, a similar lowering happens in Kuria: phrase-final L becomes SL (i.e. downgliding L) after another L (Mwita 2008; Marlo et al. 2014: 10).

Table 5: Derivations of forms with underlying {H$_{V2}$ + H$_{FV}$} melodies

	Hod. Perf	Hod. Perf. 3sɢ	Hod. Stat.	Hod. Stat. 3sɢ
UR	{H$_{V2}$ + H$_{FV}$}	{H$_{V2}$ + H$_{FV}$}	{H$_{V2}$ + H$_{FV}$}	{H$_{V2}$ + H$_{FV}$}
	[kon-aang-i-ɛ]	[kon-aang-i-ɛ]	[kon-aang-eet-ɛ]	[kon-aang-eet-ɛ]
Initial Map.	[kon-áang-i-ɛ́]	[kon-áang-i-ɛ́]	[kon-áang-eet-ɛ́]	[kon-áang-eet-ɛ́]
H$_{FV}$ Lowering	—	[kon-áang-i-ɛ̀]	–	[kon-áang-eet-ɛ̀]
Long V Retract	—	—	–	[kon-áang-eèt-ɛ̀]
R. Spread	[kon-ááng-i-ɛ́]	[kon-ááng-í-ɛ̀]	[kon-ááng-éet-ɛ́]	[kon-ááng-éèt-ɛ̀]

3.6 {L$_{FV}$}

The final set of forms to consider in this section are those that realize no H tones at all within the stem. The central question here is whether the final vowels of these verbs should be analyzed as underlyingly toneless, as proposed by Roberts-Kohno (2014), or as bearing a final L tone. We opt for the latter analysis, by a chain of reasoning that is somewhat indirect.

First, some forms that surface without any H tones in the stem are clearly derived, via Final Lowering, from forms with an underlying {H$_{FV}$} melody. In Table 6, we see that these forms occupy the exact same positions within morphological paradigms as previous forms affected by Final Lowering: object-focus forms, and forms with 3rd singular personal subject agreement.

Table 6: Final Lowering in Habitual forms

	Assertive (nonfinal)	Relative	Object-Focus
Habitual	[H$_{FV}$]	[H$_{FV}$]	**[L$_{FV}$]**
'we always hit'	né-tó-[kon-aang-a-á]	to-[kon-aang-a-á]	tó-[kon-aang-a-à]
… w/ 3sɢ subject	**[L$_{FV}$]**	**[L$_{FV}$]**	**[L$_{FV}$]**
'he always hits'	n-óo-[kon-aang-a-à]	o-[kon-aang-a-à]	á-[kon-aang-a-à]

When Final Lowering occurs in forms with a preceding H$_{V2}$ tone, it is clear that the rule must produce a final L tone, rather than a final toneless vowel. This is crucial, for example, in explaining the extent of spreading in Hodiernal Perfective forms with third person personal subject agreement (cf. Table 3): the fact that lowering of H$_{FV}$ produces L$_{FV}$ is what ensures that H$_{V2}$ is able to spread to the penult, but no further. We can reasonably assume that Final Lowering produces the same results in Table 6, where no confirming evidence from tone spread is

available. Thus, at least some forms in the language without any Hs must be analyzed as having a final L. We assume that learners simply generalize this result, positing final L in forms with no H tones even when Final Lowering is not involved. One such form is the Hesternal Perfective, which shows a final L even in the absence of object focus or a 3rd singular personal subject marker (8).

(8)   Hesternal Perfective (Object Relative clause)
      to-náa-[kon-aang-i-ɛ̀]
      '(thing that) we cut (yesterday)'

One final reason for positing final L rather than ∅ has to do with the realization of forms like the Hesternal Perfective when they occur before pause in an Assertive phrase. In these contexts, as we will see in §4.2, these forms surface with a final SL tone. This is just what we expect if, as we will propose, the ends of Assertive phrases are marked by a final floating L tone. (Note that has been independently proposed for closely-related Kikuyu by Gjersøe 2016.) In this case, we can regard the final SL tone as simply a downstepped final L, derived from the general lowering of L to SL before floating L tones discussed in §3.5. On the other hand, this simple explanation is not available if we regard the final vowel of (8) as toneless. In that case, the final floating L tone at the end of the Assertive phrase will have no preceding L tone to downstep.

3.7 Summary

In this section, we have achieved a modest reduction (from six to five) in the number of tonal melodies needed to account for the forms which Roberts-Kohno analyzes without any final SL or SH tones. A more impressive result has been a considerable increase in the internal coherence of the proposed melody set: while the melodies posited by Roberts-Kohno (2014) constitute arbitrary combinations of H_{V2}, L_{Pen}, L_{FV} and H_{FV}, our proposed melodies are simply all combinations of $\{H_{V2}\}$, $\{H_{FV}\}$ and $\{L_{FV}\}$ that assign no more than one tone to one vowel. Finally, we have identified two important synchronic processes, Final Lowering and Long Retraction, that are needed to account for intraparadigmatic alternations in stem tones, and well as the crucial role played by the OCP in blocking tone spread. In §4, we complete our analysis of verbal tone in Kikamba by analyzing forms in which additional tones are added beyond this basic melody set.

4 Floating L tones

4.1 Overview

So far, we have not yet considered any forms that Roberts-Kohno (2014) analyzes as possessing a final melodic super-low (SL) or super-high (SH) tone. In this section, we argue that these forms are best accounted for not by positing a new melodic tone, but by recognizing a distinct class of floating tones that are introduced into the derivation only after all melodic tones have been assigned. In §4.2, we begin with a discussion of phrasal tone, in which the facts concerning floating L tones are somewhat more clear. In §4.3, we then proceed to a discussion of verb-bound floating L tones which Roberts-Kohno analyzes as melodic. Finally, in §4.4, we briefly discuss a form that appears to warrant a final floating H.

4.2 Phrasal tones

So far, all verbs in Assertive clauses have been presented as they would appear in non-final position. The reason for this is that at the end of an Assertive clause, verbs systematically show the effects of a phrase-final boundary tone. These effects vary depending on whether the phrase-final verb ends in a H tone or a L tone. If the verb ends in a high tone in non-final position, then it appears with a final *falling* tone phrase-finally (cf. 9a,9b,9c). If the verb ends in a low tone in non-final position, then it ends with a *super-low* tone phrase-finally (cf. 9d).

(9) Position-based alternations in stem-final tone

    a. $\{H_{FV}\}$: Habitual 'we always hit'
        Non-final   né-tó-[kon-aang-a-á] …
        Final   né-tó-[kon-aang-a-â]

    b. $\{H_{V2}+H_{FV}\}$: Hodiernal Perfective 'we hit (today)'
        Non-final   né-tó-[kon-ááng-i-ɛ́] …
        Final   né-tó-[kon-ááng-i-ɛ̂]

    c. $\{H_{V2}\}$: Remote Perfective 'we hit (long ago)'
        Non-final   né-tw-áa-[kon-ááng-í-ɛ́] …
        Final   né-tw-áa-[kon-ááng-í-ɛ̂]

    d. $\{L_{FV}\}$: Hesternal Perfective 'we hit (yesterday)'
        Non-final   né-tó-náa-[kon-aang-i-ɛ̀] …
        Final   né-tó-náa-[kon-aang-i-ɛ̏]

Roberts-Kohno (2000; 2014) proposes that these alternations are the result of a phrasal SL tone. In a similar spirit, we propose that these alternations are caused

by a floating L_φ tone which marks the right edge of an Assertive phrase. When L_φ follows a word-final L tone, it causes it to *downstep* and surface as SL. However, when L_φ follows a word-final H tone, it docks onto the word-final vowel to form a final fall. Crucially, this docking of L_φ must take place rather late in the derivation. The reason for this concerns the interaction of L_φ with H_{V2}. As shown in (9c), when a verb with a {H_{V2}} melody is assigned L_φ at the end of the assertive phrase, the result is simply a falling tone at the end of the H tone span from V2 to FV. L_φ thus interacts with H_{V2} very differently than L_{FV}, which occupies the FV by itself and limits the spread of H_{V2} to the penult (cf. 6). The reason for this, we propose, is ordering: L_{FV} is a *melodic* tone that is assigned at the same time as H_{FV}, and is thus present early in the derivation when H_{V2} spreads to the right. By contrast, L_φ is a *phrasal* tone introduced only after all word-level phonology is complete. It is therefore not able to block the rightward spreading of H_{V2} simply because it is not present when that spreading takes place.

Two additional notes on phrasal tone are in order. First, though we have focused above on the effects of phrasal tone on a phrase-final *verb*, L_φ is always assigned to the last word of an Assertive verb phrase. Thus, if an Assertive verb is followed by a L-final noun, that noun will surface with a final SL tone due to L_φ-induced downstep (cf. 10b). Similarly, if an Assertive verb is followed by a H-final noun, that noun will generally surface with a final fall (cf. 10d). (Note that in the examples to follow, parentheses are used to mark the edges of the *Assertive* phrase, i.e. the minimal phonological phrase in which an Assertive verb appears.)

(10) L_φ manifests on the final vowel of the Assertive phrase

    a. e-i.ò
        'a banana'

    b. (né-tó-[kon-aang-a-á] e-i.ǒ)$_\varphi$
        'we usually hit a banana'

    c. n-da.á
        'a louse'

    d. (né-tó-[kon-aang-a-á] n-da.â)$_\varphi$
        'we usually hit a louse'

The second point concerns the final fall observed in (10d). A pervasive generalization in Kikamba is that falling tones are only permitted before pause. Thus, if a H-toned noun like *n-da.á* 'louse' or *cháí* 'tea' stands at the end of an Assertive phrase but is not utterance-final, we do not see a phrase-final falling tone.

Nonetheless, L_φ does not simply disappear without a trace: instead, the vowel that *would* have realized a falling tone (had it been prepausal) surfaces as *super-high* (cf. 11c). In this way, the presence of L_φ can be detected even in the absence of any L-toned surface vowel. This will prove crucial to the discussion of putatively melodic super-low tones in §4.3.

(11) $\widehat{HL}$ permitted only pre-pausally (Roberts-Kohno 2000: 252)

    a.   kemiiná
        'Kemiina (a name)'

    b.   (né-né-ké-[nɛɛngiɛ] kemiinâ)$_\varphi$
        'I gave it to Kemiina'

    c.   (né-né-[nɛɛngiɛ] kemiin̋ǎ)$_\varphi$ cháí
        'I gave tea to Kemiina'

4.3 "Melodic" SL tones

A number of non-assertive verb forms show alternations very similar to those observed at the ends of assertive phrases. For instance, verbs that show final SL in phrase-final position surface with final L phrase-medially (cf. 12a,b), while verbs that surface with phrase-final falls surface with phrase-medial SH (cf. 12c,d).

(12)   Contextual stem alternations of non-assertive verbs

    a.   ko-[konǎ]
        'to hit'

    b.   ko-[konà] ma-i.ò
        'to hit bananas'

    c.   to-í-[kon-ááng-éet-ê]
        'we had not hit (long ago)'

    d.   to-í-[kon-ááng-éet-ế] ma-i.ò
        'we had not hit bananas (long ago)'

Roberts-Kohno (2000; 2014), recognizing the clear similarities between these alternations and the phrasal alternations in (10) and (11) above, argues that both should be analyzed as the result of an assigned SL tone. Similarly, we propose that all the alternations in (10–12) derive from the variable presence of a floating L tone.

However, as Roberts-Kohno discusses at length, there is a crucial difference between the alternations observed in (12) and those involving Assertive clauses in (10) and (11). While the floating L_φ tone assigned in Assertive phrases surfaces on whatever element stands last within the Assertive phrase, the floating L responsible for downstep in (12a) and for the final falling tone in (12c) is closely bound to the verb. Thus, when it fails to downstep the final L of nonfinal *ko-konà* 'to hit' in (12b), it does not then instead cause a final downstep in final *ma-i.ò* 'bananas'. Similarly, when the floating L tone is unable to form a final falling tone on the verb in (12d), it does not trigger downstep of following *ma-i.ò*, but is instead realized indirectly through in the verb's SH tone. Unlike the phrasal L_φ tone, then, the floating L tone in (12) must be realized on the verb itself, or not at all. We propose that this is because the floating L tone in these forms is a tonal *suffix* to the verb, rather than a boundary tone to the entire phrase.

The ultimate fate of suffixal L depends both upon the final tone of its verb and on its phrasal context. If suffixal L is assigned to a verb with a final L tone, then it will manifest by downstepping that L so long as the verb appears in phrase-final position, as in (12a). In phrase-medial position, as in (12b), the floating L simply deletes, with no effect on the preceding tone. If the suffixal L belongs to a verb with a final H tone, then it will manifest as part of a final falling tone in utterance-final position, as in (12c), but as part of a final super-high tone utterance-medially, as in (12d). These options are summarized in Table 7.

Table 7: The fate of floating L tones in Kikamba (Ⓛ = floating L)

phrase-medial	phrase-final, utterance-medial	utterance-final
Ⓛ deletes	$L Ⓛ \rightarrow$ ꜜL	$L Ⓛ \rightarrow$ ꜜL
	$H Ⓛ \rightarrow$ ꜛH	$H Ⓛ \rightarrow \widehat{HL}$

The fact that suffixal L is found only in verb forms, and the fact that it is closely bound to individual verbs rather than phrases that contain them, makes it appear much like a melodic tone like H_{FV} or L_{FV}. However, just as with L_φ, the fact that suffixal L is *not* a melodic tone is shown through its interaction with H_{V2}: while melodic L_{FV} limits the spread of H_{V2} to the penult (cf. 6), suffixal L simply adds on to a long H tone span from V2 to FV. This may be seen clearly in the Negative Habitual forms in (13), where suffixal L added to a form with a $\{H_{V2}\}$ melody creates either a falling tone in utterance-final position (cf. 13a) or a final super-high tone in phrase-medial position (cf. 13b). In both forms, rightward spreading of H_{V2} is totally unimpeded by the presence of the suffixal L on FV. This suggests

that suffixal L, like L_φ, is added only after all other tones have associated and (in the case of H_{V2}) spread.

(13)   Combination of suffixal L with a $\{H_{V2}\}$ melody

    a.   to-í-[kon-ááng-á-â]
        'we do not usually hit'

    b.   to-í-[kon-ááng-á-ǎ] ma-i.ò
        'we do not usually hit bananas'

The general conclusion, then, is that while suffixal Ls are more closely linked to the verb than L_φ, they must nevertheless be distinguished from melodic tones originating from a single melody because they are assigned at different points in the phonological derivation. This limits the true melodies of Kikamba to those established in §3.

4.4 Melodic SH

A final tone pattern described by Roberts-Kohno involves a H tone span from V2 to FV which is raised to SH on the final vowel (e.g. *tw-áá-[kon-ááng-ǎ]* 'if/when we hit'). We tentatively propose that this form results from a suffixal floating H tone which *upsteps* the preceding word-final H. More investigation into these forms is required, however.

5 Conclusion

Under the reanalysis of Kikamba melodic tone proposed here, the melodic inventory of Kikamba can be reduced from the ten melodies in (14) to the five melodies in (15a–b), the latter of which may combine with the suffixal floating L tone (and, much more rarely, the suffixal floating H tone) in (15c).

(14)   Melodic inventory of Roberts-Kohno (2014)

    a.   0 melodic tones
        $\{\emptyset\}$

    b.   1 melodic tone
        $\{H_{FV}\}$ $\{H_{V2}\}$ $\{SL_{FV}\}$

    c.   2 melodic tones
        $\{H_{V2}+L_{FV}\}$ $\{H_{V2}+SL_{FV}\}$ $\{H_{V2}+SH_{FV}\}$

d. 3 melodic tones

$\{H_{V2}+L_{Pen}+H_{FV}\}$ $\qquad\qquad$ $\{H_{V2}+H_{FV}+SL_{FV}\}$

e. 4 melodic tones

$\{H_{V2}+L_{Pen}+H_{FV}+SL_{FV}\}$

(15) Our proposed melodic inventory

a. 1 melodic tone

$\{H_{V2}\}$ $\qquad\qquad$ $\{H_{FV}\}$ $\qquad\qquad$ $\{L_{FV}\}$

b. 2 melodic tones

$\{H_{V2}+H_{FV}\}$ $\qquad\qquad$ $\{H_{V2}+L_{FV}\}$

c. Suffixal floating tones

$\{L_{Suf}\}$ $\qquad\qquad$ $\{H_{Suf}\}$

This reanalysis produces a tonal inventory that is internally coherent, consisting of a few basic melodic tones whose logical combination yields the full range of attested melodies. More importantly, under this reanalysis, the melodic system of Kikamba is no longer a typological outlier whose relation to other Bantu systems is mysterious. On the contrary, the melodic system instantiates a near-canonical Bantu melody system (cf. Table 1): H and L melodic tones assigned to V2 and FV combine in melodies that target no more than 2 positions at a time. It is important to note, however, that the advantages of (15) are not only aesthetic or even only typological. Arriving at this inventory, and in the process eliminating aspects of (14) such as L_{Pen}, we have been able to provide unified tonal analyses of semantically coherent sub-paradigms (e.g. those of the Hodiernal Perfective and Stative) that were not possible using the less constrained melodic inventory. Thus, the current proposal is supported by both typological and language-internal considerations.

If this analysis is on the right track, it strongly confirms the crucial importance of synchronic analysis in the typological study of melodic tone. Because the relationship between surface tone patterns and underlying melodies is often highly indirect, we can only meaningfully compare the melodies of Bantu languages after detailed and, we would argue, theoretically consistent, analyses of them have been developed.

Finally, we end on what is to us, at least, an optimistic note. Looking at the incredible *surface* diversity of melodic tone patterns in Bantu, it can be tempting to conclude that melodic assignment is an inherently unconstrained system, where

essentially anything is possible, and where the melodic inventory of a given language is limited only by what its idiosyncratic history makes possible. In the course of our analysis of Kikamba, however, we hope to have shown that the considerable surface diversity observed in Bantu melodic tone patterns is often misleading. With synchronic analysis that carefully distinguishes surface stem tone patterns from underlying melodies, it is possible to find deep similarities between superficially distinct melodic systems. This opens up the possibility that perhaps melodic tone in Bantu is more constrained than it initially appears, so that it may ultimately be possible to state strong restrictions on what constitutes a possible melodic system.

Abbreviations

Glosses are abbreviated as follows:

1PL	first person singular	NEG	negation
ASP	aspect	PFV	perfective
ASSERT	assertive	PST	past tense
CAUS	causative	RECP	reciprocal
FV	final vowel	REV	reversive
ITER	iterative	SBJ	subject marker
NC.5	class 5 nominal concord prefix	UR	Underlying representation

Tonal abbreviations are:

H	high	SH	super-high
L	low	SL	super-low

Stem position abbreviations are:

V1	stem-initial vowel	FV	stem-final vowel
V0	pre-stem vowel	Pen	penultimate vowel
V2	second stem vowel		

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