

Tone and Accent, and Getting the Two Together

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Tone and Accent, and Getting the Two Together

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1. Introduction

It is not a particularly controversial claim that English has an accentual system, though precisely what such a claim means is certainly open to dispute. If one works within the framework of metrical theory, then just how to pick out one characteristic of the system as making it "accentual" is far from obvious. I would like to do just that, though: I would like to pursue the (admittedly somewhat fluid) notion that an accentual system is one which uses the top row of the metrical grid to assign tone, and furthermore that the tone assignment that it accomplishes is autosegmental in character.

In some earlier papers on Bantu tone systems (especially Goldsmith (1982, 1984, and the introduction to Clements and Goldsmith (1984)), work that developed ideas of James McCawley's (McCawley 1978), I pursued the idea that tone languages could be derived (derivationally) from a deeper level at which the relevant information was not present on a separate tonal tier. Instead, we posited an "accent", represented as an asterisk, which was present in the linear string, rather than being on a separate autosegmental tier. It differed from a familiar feature primarily in that it tended to move around, hopping to the left or right under various circumstances.

My main goal in this brief paper is not to discuss English or languages like it, but rather to discuss a language that has the pedigree and the patrimony of a thoroughly classical tone language, yet which apparently assigns its tones through a system of accent placement that looks surprisingly like the systems of accent placement that we are familiar with from the stress languages described in the literature. This language is Kintandu, from the Kikongo group. One of the main points that I will try to make is that the notion of "extrametrical" is involved in the description of Kintandu, and you can't have an extrametrical syllable without the notion of metrical structure being involved. In particular, I will try to show that the it is the notion "extrametrical" that is involved and not the closely related notion of

"extratonal" which we would probably have expected in the analysis of a straightforward tone language. If this is correct, then the accent systems posited for tonal systems will take a major step towards reducing (in Clements' neat phrase) to "degenerate grids".

After discussing some of the details of the nominal system of Kintandu, I will conclude by considering just how far we might want to pursue these parallels. What is it that makes us think that Kintandu is not just a stress system? What makes us think English is not just a tone language?

2. Introduction.

Recent work on Bantu tone has for the most part shied away from tackling the analysis of tone systems of the group of languages generally referred to as KiKongo, or of any of the languages closely related to it. [1] Perhaps with good reason; analysts working on such languages as Kintandu are quite explicit in noting how different their tone systems seem to be from the better understood eastern Bantu tone systems, the kind of tone systems discussed, for example, in Clements and Goldsmith (1984).

In systems such as these, such as that found in Kintandu, two characteristics stand out. First, there is a good deal of tonal variation in the noun (and also the verb) governed, directly or indirectly, by the grammatical role played by the noun or by the grammatical role played by the sentence in which the verb appears. Second, within the noun or the verb category, there are several underlying "tonal" categories (three, four, or more such categories), but these are not categories in the sense familiar from recent studies in eastern Bantu languages. These "Groups" cannot be felicitously identified with an underlying tonal melody, or even as a sequence of underlying accents. Rather, the main parameters of variation across what is allowed as underlying specification seems to be (i) whether the final syllable will bear a tone or not; (ii) whether there is an underlying High tone or not; and (iii) whether this High tone associates with the first or the last vowel of the stem. These characteristics are quite different from the patterns expected from eastern Bantu languages. While one can describe these facts using autosegmental notation, the description ends up

being, in a sense, a series of excuses for why this systems is different from Eastern Bantu systems. We need something better than that.

3. Kintandu

Daeleman (1983) presents a sketch of Kintandu, in the KiKingo group, which meets this general description. According to Daeleman, there are four Tone Groups of nouns, and four Tonal Cases in which these nouns can appear. The surface tone of a noun from a given Tone Group varies depending on the Tonal Case that it is realized in. Each noun, that is, can appear in any of four possible tonal forms; which form is used depends on the general syntactic environment, and the environments can be divided into four, which we then call our four Tonal Cases.

Let us describe these facts in a bit more detail. There are four Tone Groups of nouns; we will begin by calling them TG 1, TG 2, TG 3, and TG 4, and every noun falls into one of these four Groups. There are four Tonal Cases, which Daeleman calls I, II, III, and IV. The first of these we may call the "Basic" case, because it is closest to the underlying form (no tones are grammatically inserted or deleted in this Tonal Case); the third we may call "defocused", because the all the tones are Low in this Tonal Case. These eight distinctions interact in the following ways.

Tonal Case I is used for subject or object NPs. When used "predicatively" in the affirmative ("it is an NP"), Tonal case II is used, and Tonal case IV is used for negative predicative uses. Tonal case III is used, according to Daeleman, for "the first unit of a phrase in subject or object function," apparently just for use in the case of an associative construction ("the X of [the] Y").

4. The Basic Tonal Case I.

In the basic Tonal Case I, TG 1 nouns are all Low-toned; we may, therefore, identify TG 1 as the class of underlyingly toneless nouns. TG 2 nouns have a High tone on the penultimate mora. (See Table 1 below. The data there gives whole words, with the noun class prefix separated by hyphen; the tone rules apply to stems, however, not to words).

At this point I would like to refer to the notions of "extratonicity" and "extrametricality", notions which have been discussed in the literature for several years (a decade, in the case of the latter term). An inspection of the various forms in Table 1 shows that a High tone, if one is present, associates with either the penult or the ultimate syllable. In classical generative phonology of the SPE vintage, if the difference was not phonologically predictable, the burden of the difference would have fallen to rules being marked to apply irregularly to the individual cases. We might have established one rule to associate a High tone to the last syllable of a word, and another rule to associate a High tone to the penult; we might have tried to decide which was the marked and which the unmarked case; and then we would have assigned each lexical item to one rule or the other.

In the developments of autosegmental and metrical phonology, a major (but never made-explicit) change in analysis has lain in the effort to somehow make the phonological representations themselves more responsible for what happens to them, and less whimsically subject to the rules that are externally imposed on the underlying forms of the language. From this vantage point one can look for simple phonological rules whose effects may be made slightly more complex by the particulars of the forms to which they apply. That is the motivation for the notion of "extrametrical syllables": these are syllables which the rules of accentuation are blind to. Extratonic syllables, in quite parallel manner, are invisible as far as the tonal principles of the language are concerned. Extrametricality marking plays a major role in establishing where the grid marks on a metrical grid will fall, for initial or final syllables ("peripheral" syllables) may be marked as extrametrical. Extratonicity plays a role in autosegmental analyses, where tones will fail to associate with what would seem otherwise like an otherwise inviting-looking vowel, just in case that vowel is marked as extratonic.

The natural place for a tone to associate is either the first or the last vowel of a word: this is the limiting case of the now classic observation that in tone languages, the tone melody is mapped onto the vowels either from left to right or from right to

left. In this case, the trend, we can see, is to map the High tone to the last vowel, but in TGs 2 and 3 the final syllable is sometimes immune to the tonal association. Since Kintandu has the hallmarks of an autosegmental tone language (and, indeed, does use tone autosegmentally), I will begin by assuming that this difference between the tonal groups involves marking certain word-final syllables as extratonal, and that a rule associating a tone to the "final" vowel is in order, as written in (2). I will later come back and try to show that this was the wrong approach, and that extrametricality is more appropriate; but for now, that would seem odd, and we will pursue the more straightforwardly tonal perspective.

Let us say that TG 2 nouns are those that are underlyingly or lexically marked with their final syllables extratonal. We shall furthermore suggest that all toneless nouns (i.e., TG 1) have this property as well, redundantly, though the reason is not yet obvious by any means.

TG 2 nouns have a lexical High tone, and we will have to get it to associate with the last vowel. This will be accomplished by the Tone Association Rule 2, whose initial formulation is given just below. The intent of this formulation is to assign the rightmost High tone to the final vowel of the word, where the rule is blind to a word-final syllable marked extratonal. This understanding of the formalism would allow rule (2) to associate a High to a penultimate syllable when the ultima is extratonal; as I have indicated, though, we shall consider a quite different interpretation below. TG 3 nouns have a High tone, which is realized on the final mora in shorter nouns (those whose stem has one or two syllables), and on the penult in longer nouns. This is due, we shall suggest, to a rule assigning final-extratonicity in certain grammatical conditions; we will call this the "Extratonic Marking Rule", given in (1). TG 4 nouns have a lexical High tone, and it is assigned to the final vowel; thus the final vowel here is not extratonic. Rule (2), it should be clear, applies after rules (1), since (1) prepares the ground for it to apply appropriately.

(1) TG 3 Extratonal Rule (lexically governed) -- for TG 3 nouns only, where "S" stands for "syllable" (stem-level rule).

S --> (S) / S S -- #

(2) Initial Tone Association Rule (first formulation):

V]
 . stem
 .
 (H)]

In sum: "Basic tonal case":

Tone	Final Syllable	Extratonicity marking
TG 1	L (or none)	Final syllable (but not obvious!)
TG 2	H	Final syllable
TG 3	H	Rule (1)
TG 4	H	none

TG 1	TG 2	TG 3	TG 4
ma-solokoto	ki-butukúlu	ma-fwatabála	ki-tundibilá
ki-nwaaninu	ki-taaninu	ma-kaákíla	ba-teekoló
ki-menina	ma-kyéléka	ki-kalála	ki-kokilá
ma-biibi	ki-wiina	ki-tuutú	n-tuutú
ma-lafu	lu-ngwéni	ma-tutí	ma-kukú

Table 1

5. **Second Tonal Case.** In the second Tonal Case, we find patterns like the following:

Second Tonal Case

TG 1	TG 2	TG 3	TG 4
ma-solokóto	ki-bútúkúlu	ma-fwátábála	i-túndibila
ki-nwaanínu	ki-táánínu	ma-káákíla	ba-téekolo
ki-menina	ma-kyéléka	ki-kálála	ki-kókila
ma-biíba	ki-wiina	ki-túutu	n-túutu
ma-là'fu	lu-ngwéni	ma-túti	ma-kúku

Table 2

A look at TG 1 suggests that in this Tonal Case, a High tone is added to the lexical tone of the noun, since we have already posited TG 1 as being underlyingly toneless, and a High tone appears here on the penult. In addition, we see that a "plateau" or sequence of High tones is formed in TGs 2 and 3 by what we take to be a general rule specifying that all syllables are High when surrounded on the surface by High tones (of which only one can be the lexical one, given what we have suggested so far). Thus again, this Tonal Case appears to add a High tone to the lexical tone of the noun. In TG 4, a High appears on the first syllable of the stem, and not on the last, surprisingly; we shall suggest that a High tone is present on the final vowel in an intermediate stage of the derivation, and is removed by rule.

We thus posit a grammatical High tone prefix "H" which is prefixed in Tone Case II (and also Tone Case IV, as we shall see shortly).

We suggest that extratonicity marking to the final vowel is assigned again lexically to TGs 1 and 2, and by rule (1) to TG 3. TG 4 **never** has its final vowel marked extratonic. Even though we do not see a High tone on the surface, the final vowel is still not extratonic here in TG 4, whose account we will return to in a moment.

We have already said that the last tone is assigned to the last (non-extratonic) vowel in the stem, and we see that any grammatical High tone is assigned to the first vowel. This second tone association is produced by rule (3). The relationship between the two tonal association rules, (2) and (3), will be discussed further below; for now, we may just say that they are extrinsically ordered, with (2) before (3), that is, we associate a High to the last vowel, and only after that try to associate a left-over High tone to the first vowel. The condition that the High be floating (as indicated by the circle around the H in (3)) ensures that it applies only to Highs that have already not been affected by rule (2).

(3) Clean-up Tone Association Rule

$$\begin{array}{c} [\quad v \\ \text{stem} \cdot \\ \cdot \\ \cdot \\ \textcircled{H} \end{array}$$

The four relevant cases then would work as follows:

Tonal Case 2 "Final-Extrametricality Case"

TG 1: ma-soloko(to) (lexical extratonicity
marking)

· (by rule (2))

·
·
H (inserted by the Tonal case)

TG 2: ki-butuku(lu)

· ·
· ·
· ·

H H (one tone lexical, one from
the Tonal Case)

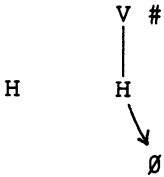
TG 3 nouns work just like TG 2 nouns in this Tonal Case except for nouns of the form CVVCV. Such nouns in TG 2 have a long High tone (c'v'vcv), while such nouns in TG 3 have a falling tone (c'vvcv). Consider the contrast in the following four examples:

(4)	TG 2	TG 3
Tonal Case I	ki-wiina	ki-tuutu

Tonal Case II	ki-wiina	ki-tuutu
---------------	----------	----------

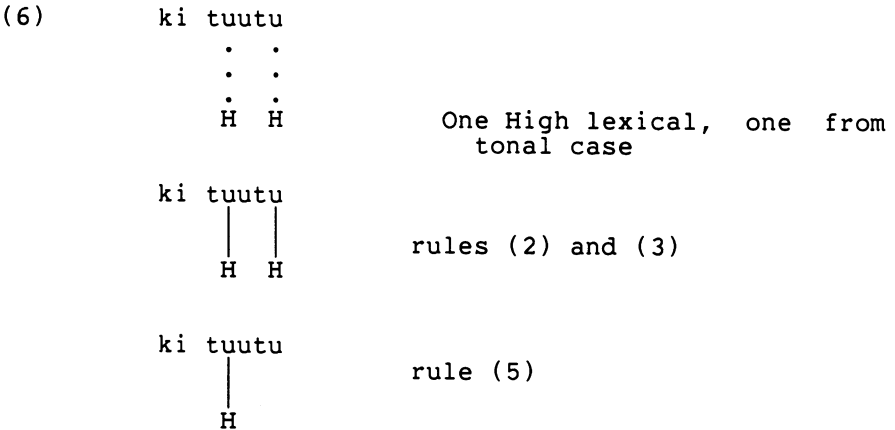
We suggest that the slight difference seen in the second row of (4) is due to the lexical tone of ki-tuutu (TG 3) actually being placed on the final vowel, just as it is in the Tonal Case I. The lexical tone of the ki-wiina appears on the penult, because the final vowel is always extratonic in TG 2. We will posit a rule (5) which deletes a High tone on the final vowel if preceded by another High tone.

(5) Final High deletion



It will be important for us to notice that rule (5), Final High Deletion, applies only to High tones associated with the absolutely final syllable. If an extratonal syllable follows, a penult bearing a High tone will not lose that tone by rule (5). This interpretation conflicts with the one suggested above rule (2), the Initial Tone Association rule, and will be the basis below for our reinterpretation of what we have called "extratonicity" as being actually extrametricality.

Given this understanding, ki-túutu is derived as in (6).



If we assume, as we have done, that TG 4 nouns have an underlying H, and that they get a second High in this tonal case (just as TG 2 and TG 3 nouns do), then rule (5) is exactly what we need to account for their derivation, as we see in (7).

(7) ki-túndibila
 | |
 H H
 ↘
 ∅ by rule (5)

6. **Third, or Defocused, Tonal Case.** This is the simplest tonal case; all nouns are Low in tone in this case. We will not worry about its analysis.

7. **Fourth Tonal Case.** This Tonal Case is just like the Second Tonal Case for TGs 1 and 2, and similar to it for TGs 3 and 4.

Fourth Tonal Case

TG 1	TG 2	TG 3	TG 4
ma-solokóto	ki-bútúkúlu	ma-fwátábálá	
ki-nwaanínu	ki-táánínu	ma-káákílá	ki-túndibílá
ki-menína	ma-kyéléka	ki-kálálá	ki-téékóló
ma-bííbi	ki-wíína	ki-túútú	ki-kókílá
ma-là'fu	lu-ngwéni	ma-túítí	n-túútú
			ma-kúkú

Table Three

We will suppose that a High tone prefix is added in this Tonal Case, just as with Tonal Case II. Then TG1 and TG 2 **should** work just as in Tonal Case II, and they do. TGs 3 and 4 here act differently from Tonal Case II only in that their final syllables do get a High tone. We may account for this by (i) making rule (1) not apply in Tonal Case 4, and also by making Final High Deletion (5) not applicable in Tonal Case IV.

8. Some reconsiderations.

The system we have arrived at so far is not unreasonable. It consists primarily of an extratonicity rule (1) and two subsequent tone association rules, (2) and (3).

- (1) Extratonal Marking Rule (lexically governed) -- defines "TG 3" nouns. Does not apply in Tonal Case 4.

S --> (S) / S S -- #

(2) Initial Tone Association Rule (first formulation):

v]
· word
·
⊙H]

(3) Clean-up Tone Association Rule

[v
stem ·
·
⊙H

I would like to suggest an alternative view of the analysis presented so far in which it is not **extratonicity** which is the crucial variable, but rather **extrametricality**. This perspective is motivated by three points: (i) the observation above that the "blindness" of tone rules to extratonal syllables is only partial; rule (5) must be quite aware of their presence; (ii) the desire to see rules (2) and (3) as part of a single process, that of assignment of High tone to a metrically Strong position, a point investigated in several recent papers on KiRundi and Xhosa; and (iii) the desire to view the assignment of a High either to the ultima or penult as being parallel to the assignment of metrically Strong position to one of the last two syllables.

Point (i) will follow directly if we drop the notion of extratonicity from our analysis, and say rather that **accent** is assigned to either the ultima or the penult. Rule (5) will thus apply correctly. Furthermore, rules (2) and (3) can be assimilated to a general schema for association of High tones to accent syllables.

What would this general schema be? It has been suggested in many places in the literature (most fervently, perhaps, by the present writer) that an "accentual principle" exists which associates an accented tone -- let us simplify here, and say simply a High tone -- to an accented vowel. In the case of Kintandu, however, it makes most sense to say that there are two levels of accent, primary and secondary. The first-vowel of the stem always receives secondary accent, while the primary accent falls either on the ultimate or penultimate syllable of the stem. In this

way, we reinterpret the rules which marked the final syllable as "extratonal" (rules 1 and 3) now as rules marking the final syllable as extrametrical in the familiar sense. Rule (1), in particular, looks like a familiar sort of rule in this light. Using the metrical grid as the basis of our notation, we would derive a representation as in (8) for a word such as *ki-bútúkúlu*, a TG 2 word in the Second Tonal Case.

(8)

			x
	x		x
	x	x	x
	bu	tu	ku (1u)

In the terminology of Prince (1983), both the left and right versions of the End Rule apply in (8), and the right-side version of the End Rule reapplies at the word level in (8) to give the representation found.

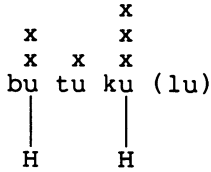
Rules (2) and (3) can then be assimilated to a single schema, which we would offer as a part of prosodic phonological theory. This schema would say that if there were a single tone, it would associate to the position with the greatest accent (the highest rank on the grid). If there is a tone left over, it associates with the next highest accent, and so forth. If this schema is stated as a well-formedness condition rather than as a set of instructions, we will not have to worry such pseudo-problems as making sure that in a case like (8), it is the right-hand High that associates first with the primary-accented vowel rather than the left-hand High.

(9) The Tone-Accent Attraction Condition

A tone-to-grid structure is well-formed if and only if there is no tone-bearing syllable which has a lower level of accent than a toneless syllable. [Thus, if a syllable S has a tone, all syllables with a greater level of accent than S must also bear a tone.]

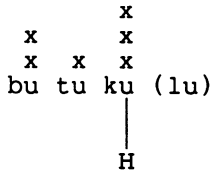
Given the Tone-Accent Attraction Condition in (9), only (10) will be permitted as a possible tonal association of two High tones with (8).

(10)



With the same grid structure, but only one High tone (as in the Basic Tonal Case I), then the only permitted structure is as in (11).

(11)



The analysis of the data from Kintandu presented thus far would reduce, then, to the following points: (i) a lexically governed extrametricality rule (1); the general condition on tone-accent relation given in (9); and the Final High Deletion rule (5), a simple tone rule.

9. KiYaka.

The following discussion of KiYaka, a language not too distantly related to Kintandu, is based on the material in van den Eynde 1968, as well as a handout prepared by van den Eynde for a 1984 presentation in Eisenstadt, Austria.

There are three Tone Groups in KiYaka, and three Tonal Cases. I shall attempt to make the assignment of numbers match up with the categorization already given for Kintandu, though the correspondence is, of course, far from perfect.

The first Tonal Case is the one that van den Eynde calls "indeterminate", as in Table 4. [TG 1 corresponds to van den Eynde's Group C; TG 2 to his Group B, and TG 3 to his Group A].

TG 1	TG 2	TG 3
m-beetukulu	ba-themuthému	yi-saambiká
ba-yakala	ma-kulúndzi	yi-sengelé
ba-ngoomba	ba-ngaandú	ma-heembó
ma-bala		ma-kalá
mu-tu		ma-tá

Table Four

We can see that TG1 has no High tone in this Tonal Case, and like the TG 1 in Kintandu, has no underlying tone. TG 2 has penultimate High, unless the stem has only two syllables. In this case, the first syllable must be long, and the High appears on the final vowel instead of the penult. (That is, there are no bisyllabic noun stems in this TG with a short first syllable, nor any monosyllabic stems.) In TG 3, the High appears on the final vowel.

If it is possible to analyze KiYaka along the lines suggested in the preceding section, then the primary accent in TG 2 is on the penult, and in TG 3 on the ultima; i.e., the final vowel in TG 2 is lexically marked as being extrametrical. Both TG 2 and TG 3 have a lexical High tone, whereas TG 1 does not.

(12) V --> (V) / -- # (minor rule, TG 2)

The second tonal case is the one that van den Eynde calls "determined", and corresponds to the third tonal case of Kintandu, in which all vowels are Low in tone. There being not much to say, we will say nothing about this nominal tonal case.

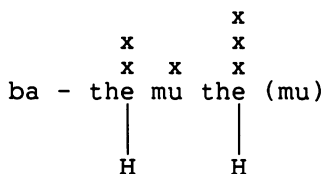
The third and final tonal case in KiYaka is the "determinant" tonal case, with such forms as the following:

TG 1	TG 2	TG 3
m-béétúkúlú	ba-thémúthému	yi-sáambika
ba-yákálá	ma-kúlúndzi	yi-séngelē
ba-ngóómbá	ba-ngááandu	ma-héembo
ma-bálá		ma-kála
mú-tú		má-ta

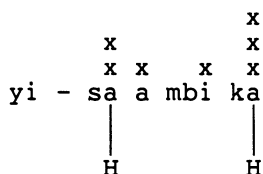
This Tonal Case clearly corresponds to the Second and Fourth Tonal Case in Kintandu, where High is imposed grammatically (a point that does not escape van den Eynde).

TGs 2 and 3 are easily derivable given the analysis set up so far for Kintandu. We will assume the same accent rules operate in these two classes as are mentioned in the analysis of example (9)-(11) above in Section 8. Thus the first and last vowel of the stem is accented in TG 3, and the first and penult are accented in TG 2:

(13) a. TG 2



b. TG 3



Tones **must** be associated as indicated in (13), given the Tone-Accent Attraction Condition suggested above. We suggest that the Final High Tone Deletion rule (5), above, is operative in KiYaka as well as in Kintandu, thus deleting the second High in 14b (TG 3), but not in 14a (TG 2).

The only form that needs to be accounted for, then, is the TG 1 form, in which the grammatically inserted High tone is assigned not to the final vowel, as it would be in Kintandu, but is, instead, spread across the entire stem.

It is not clear to this writer at this point whether it would be more appropriate to view the spreading of the High tone as the result of a language-specific tonal rule (which would be easy to write, in and of itself), or to view it as a way of maintaining tone/accent parallelism in special circumstances. This second, much more speculative, approach would suggest viewing TG 1 forms as having equal grid markings on all stem vowels (for the sake of concreteness, let us say all unaccented, as in 15). Then the modification required in the Tone-Accent Attraction Condition would be as follows, where the changes are given in square brackets: "A tone-to-grid structure is well-formed if and only if there is no tone-bearing syllable which has an [equal or] lower level of accent than a toneless syllable. (Thus, if a syllable S has a tone, all syllables with a greater [or equal] level of accent than S must also bear a tone)." The change is

minor, but expresses the idea that if there is a sequence of syllables with the same metrical prominence, one of the syllables cannot then be selected for tonal prominence.

10. Conclusion.

Limitations of space preclude any lengthy discussion of the further significance of the Tone-Accent Attraction Condition. One can see again in the present analyses the way in which yet again metrical structure, though it itself has little direct phonetic realization, serves to organize other aspects of the phonological representation.

The Kintandu and KiYaka cases are different from other Bantu languages in that the tones are underlyingly unassociated. In most Bantu languages, the tones are underlyingly linked to particular vowels (or are linked in a way that precedes and ignores the Tone-Accent Attraction Condition, perhaps because the associations precede the establishment of metrical structure). In a number of Bantu languages, however, we can see the effects of the Tone-Accent Attraction Condition in modifying or distorting the deeper associations in order to shift a High tone to an accented position. Further work will clarify the precise connections between these various types of tone and accent systems.

The two biggest differences between the use of the metrical grid by Kintandu (as opposed to its use by a more traditional accent language like English) appear to be the lack of local phonetic manifestations of the lowest row on the metrical grid, i.e., loudness and length. I think it is of considerable interest that any number of languages have been discussed in the metrical literature in which the lowest grid row, which normally is realized as local stress, must specifically be marked not to be so realized. (This is the case in any language where stress falls on the first heavy syllable or else the last syllable, for example, or in any language where bounded metrical feet must be established for analytic purposes, though no alternating stress is described phonetically). The general picture that emerges is that the bottom row of the metrical grid is typically realized as local stress, though this option may fail to be chosen by the language, while the top row is used to associate autosegmental tone to the skeleton.

Footnotes

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