

AUTOSEGMENTAL ANALYSIS OF TONE IN MONOSYLLABIC INFINITIVES IN MEETTO-MAKHUWA

Joseph Hokororo Ismail

Institute of Judicial Administration, Lushoto

Abstract. This study analyzes tone in monosyllabic infinitives of Makhuwa (Bantu, Tanzania and Mozambique, P.31, described in Guthrie 1948:670) and how the autosegmental approach can successfully handle such a word category for which there seems to be no straightforward derivational approach. It is generally assumed that these tonal analysis strategies are characterized by recycled tonal rules which have differing approaches in monosyllabic functions (cf. Marlo 2007, Massamba 2010, Ismail 2011). Despite the attention given to tonal analysis of other word categories in infinitival forms, the relevant facts about the analysis of tonal in monosyllabic forms and the complications that arise in these derivations have not been exhaustively described. In this descriptive account, with the application of the Autosegmental Framework (Goldsmith 1976), it shows that the analysis of tone in monosyllabic infinitives is a much more complex phenomenon than the literature in Bantu tonal studies suggest. It has been shown in this paper that tonal analyses in accentual approaches are proposed to handle monosyllabic forms but are subjected to many tonal rules as compared to melodic approaches which capture more linguistic generalizations and simplicity.

Keywords: Monosyllabic, Infinitives, Accent, Melody, Autosegmental Theory

Languages: Makhuwa

1. INTRODUCTION

This study explores the extent of which tone in monosyllabic infinitives can be analysed using insights of auto segmental framework. The study was guided by the following three objectives: 1) to describe tone in monosyllabic infinitives using a classic autosegmental phonology of which an accentual approach was used; 2) to describe tone in monosyllabic infinitives using a melodic high approach; and 3) to establish tonal rules for both the accentual and melodic approaches in order to see the similarities and differences of the two approaches with regard to tonal rules.

The analysis is based on the Meetto-Makhuwa language, a Bantu language spoken in Tanzania (P.31 according to Guthrie 1948:670). According to the *Languages of Tanzania Atlas* (2009:72), Makhuwa is spoken by approximately 300,825 people in Tanzania. It is hoped that this description of Meetto will be a useful reference for phonological studies pertaining to Makhuwa tone generally and other closely related tonal languages. Since Makhuwa is a Bantu language, this study will be an important source in the field of comparative studies on Bantu tonal languages, especially in the handling of tone within accentual and melodic high approaches.

A monosyllabic infinitive verb stem is that which consists of an entirely consonantal root plus a final vowel (Cassimjee 1986). As in the case of most Bantu languages, roots of the

monosyllabic infinitives cause analytical problems. In terms of number, monosyllabic verb stems form a small class of roots which contain just of one or more consonants and no overt vowel. These roots are referred to as monosyllabic verb stems, since with the addition of the obligatory final vowel they form a single syllable (Cassimjee 1986). The final vowel of a stem in this category happens also to be the first syllable of a stem. Again, this phenomenon poses challenges in tonal analyses. These roots do not have an overt vowel in Meetto-Makhuwa and has high and low tones. In Meetto-Makhuwa, monosyllabic verb stems may motivate an underlying vowel that either deletes or undergoes glide formation as in /u ku+a/, which yields /ukwa/.

As for the previous studies of monosyllabic forms, several studies have contributed to our understanding of tonal behavior in Bantu languages. Marlo (2007) discusses in depth the verb tone patterns of the Lunyala language of Kenya. In this study, Marlo observes that the tonal patterns in Lunyala differ by tense depending primarily on the following four factors: (i) Whether the grammatical H suffix, called the “melodic H,” is assigned to the left or right edge of the verb stem; (ii) whether a H contributed by an object prefix is subject to shifting; (iii) whether the lexical H of /H/ verbs is subject to deletion before the melodic H; and (iv) whether the melodic H is deleted from the second syllable of the stem. He noted that within each tense, there are several possible tonal sub-patterns, depending on the underlying configuration of Hs. In every tense, there is an underlying tonal distinction between /H/ and /Ø/ stems, though this distinction is neutralized on the surface in some contexts.

Massamba (1984) describes at length aspects of tone and accent in ci-Ruuri. He argues that ci-Ruuri should be considered as an accent language and that the tonal behavior that is observable in this language is triggered by the accentual nature of the language. Throughout his discussion, it has been shown that ci-Ruuri has two basic tones: High and Low. The rising and falling tones which are exhibited in this language are the result of a combination of a low tone and a high tone or a high tone and a low tone, respectively.

In ci-Ruuri, words can be either underlyingly accented or unaccented. It is the underlying accent that triggers the surface high tones. To illustrate this, Massamba gives a detailed description of this language using surface tone assignment, penultimate back hopping, stem accent deletion, OM accent shift, tone simplification, and final high spread rules. Essentially, Massamba’s work is a practical contribution on how ci-Ruuri and closely Bantu languages with similar tonal behavior can be analyzed.

Odden (2006) has investigated the tone behaviour in the Chimaraba dialect of Makonde. In this study it has been shown that, as in many Bantu languages of Southern Tanzania, verbs in Makonde have no lexical tone properties, He claims that verb stems all select a single H tone which is then mapped to some stem vowel or is deleted depending on the tense of the verb. In this description, the question of adjacency constraints in phonology has been raised. He presented three generalizations about verbal tone in Chimaraba that guide his analysis:

- a. There are no vowel length contrasts, but due to a regular stress rule, the penultimate syllable of every word is lengthened.
- b. Almost every verb tense and noun requires some kind of H tone on its penultimate syllable.
- c. A word-final syllable virtually never has H tone.

Using this generalization, again Odden (2006:30) treated Chimaraba data description at the level of the syllable to explain why final syllables in Chimaraba never have H tone and ultimately treated the final syllable as extra prosodic.

In conclusion, two facts can be noted from the available literature on the analysis of tone in monosyllabic infinitives in Bantu languages. First, most of the analysis concentrated on the tone in other infinitive categories avoiding monosyllabic infinitives; second, apart from the analysis by Massamba who uses accentual perspectives, other studies treated monosyllabic infinitives with a melodic approach. Therefore, the issue of tonal analysis in monosyllabic infinitives is a topical problem because there is no common agreement as to whether these tones can be analyzed in an accentual or purely tonal approach. Thus, this necessitates a deep analysis of tone in monosyllabic infinitives in Meetto-Makhuwa.

1.1 THEORETICAL FRAMEWORK

This study uses the insights of autosegmental phonology as its theoretical framework. In this section, we will sketch the essential aspects of the theory to tone. For a comprehensive discussion of autosegmental phonology, the reader is referred to Goldsmith (1976), Massamba, (1984), Cassimjee (1986), and Mwita (2008) among others. Autosegmental phonology assumes that phonological representations consist of a number of independent sequential features. According to Cassimjee (1986), an item in tone may be represented as a sequences of tonal specifications independent of any other phonological feature, and each of these independent lines in a phonological representation is referred to as a tier. The multilinear view of phonological representation claims that the various tiers are ultimately coordinated in terms of a sequence of abstract timing units. This sequence of abstract timing units is referred in different versions of multilinear phonology as the core, the skeleton, or the CV tier. The theory of autosegmental phonology represents the coordination of the tiers.

The units in the skeleton are themselves organised into syllables and possibly into other hierarchical units. The AP represents the coordination of the tiers in association lines. In the present study the tone of monosyllabic infinitives in Makhuwa will be analysed using both a classic accent and melodic high of autosegmental phonology and will argue that the melodic high approach allows for more insight compared to a classic accentual analysis.

2. METHODOLOGY

In order to provide a coherent and systematic account of tonal data in monosyllabic infinitives in Makhuwa, a variety of sources have been sought out and used in an effort to elicit as much data as possible. This has been done purposely because a large amount of data is needed in order to carry out various tests for the different tonal paradigms.

Formal and informal interviews were carried out. In formal interviews there was a standard Kiswahili corpus, and informants were asked to provide the equivalents in Makhuwa. Informal interviews were also used in order to make it possible to ask additional questions for further information and clarification when necessary. The responses to these interviews were recorded.

Relevant literature from different sources were consulted so as to obtain some linguistic information about the language under study. Data about the Makhuwa infinitive were found in Ismail (2000, 2011). Additionally, some of the data used in this study arrived directly from the author's native speaker intuition. Finally, several other native speakers were consulted to check and confirm data.

3. RESULTS AND DISCUSSION

The tone marking in this study is that standardly used for Bantu languages that, i.e. an acute accent above a vowel indicates H tone, and an unmarked vowel indicates L tone. A morpheme boundary is indicated by += and a phrase boundary by ##=. Finally, * refers to an accented vowel and ** to an incorrect/ungrammatical form.

3.1 THE ACCENTUAL ANALYSIS

Before undertaking the analysis of monosyllabic tone, let us first consider simple infinitive verbs as in (1) and monosyllabic infinitives as in (2) below:

- | | | |
|--------|--------------------------|--------------------------|
| 1. (a) | <i>u vá la</i> | 'to hold' |
| | (b) <i>u vá ré la</i> | 'to hold for' |
| | (c) <i>u vá ré la na</i> | 'to hold for each other' |
| 2. (a) | <i>úkwa</i> | 'to die' |
| | (b) <i>úwa</i> | 'to come' |
| | (c) <i>úrwa</i> | 'to go' |
| | (d) <i>úvya</i> | 'to burn' |
| | (e) <i>úlya</i> | 'to eat' |
| | (f) <i>úrya</i> | 'to drink' |
| | (g) <i>únya</i> | 'to defecate' |

The two sets of examples in (1) and (2) differ with reference to the number of syllables. There are two stem syllables in (1a), three stem syllables in (1b), and four stem syllables in (1c), whereas in (2) there is only one syllable stem. Tonally, in (1) all the infinitives begin with low tone /u/, followed by a sequence of high tones of which a final syllable is low tone. We further observe that in (2), the first syllable of the stem has high tone. Furthermore, when the stem has three or four syllables, the high tone spreads rightwards but excludes the final L-tone syllable.

Having considered the infinitive forms in (1) and (2), there is one fundamental issue to be addressed here that has to do with the status of the infinitive /u/ in the two examples. What are the reasons that /u/ has a high tone in monosyllabic infinitives while the /u/ of similar infinitives in (2) have a low tone on the same position /u-/? We, therefore, need to explain what has triggered this move, which is very different from what we have seen so far. Theoretically, the minimalist condition can be used as one of the reasons to account for the appearance of high tone in monosyllabic infinitives, as suggested by Mwita (2008). This is a constraint that some languages exhibit, which requires a well-formed word to be of a certain length in

order to yield an acceptable form. In Meetto-Makhuwa, the minimal length is monosyllabic form. Therefore, this can be taken as the reason as why /u/ of monosyllabic infinitive has low tone. This phenomenon has also been attested to many Bantu languages as noted by Mwita (2008); Odden (2006); Marlo (2007) and Massamba (2010), to mention but few.

Let us now consider tonal rules for the analysis of the forms presented earlier in (2). Underlying vowels are either marked for accent or not, and which accent is realized is determined lexically or grammatically by morphological and tonal rules. As suggested by Massamba (2010), we shall adopt Goldsmith’s (1976) asterisk (*) notation, i.e. the lack of an asterisk indicates that a given vowel is unaccented. In accentual analysis of tone, Ismail (2011) observed that in Meetto-Makhuwa the accent is assigned to the first syllable of the stem by a tonal rule known as the *Stem Accent Assignment Rule*, as formulated below. In this approach, the star above the relevant syllable indicates the accentual property as suggested by Goldsmith (1976):

Rule 1: Stem Accent Assignment Rule

$$\begin{array}{ccc}
 & * & \\
 +\# (C) V (C)V & \longrightarrow & + \#(C) V (C) V \\
 \text{v stem} & & \text{v stem}
 \end{array}$$

The rule states that the first syllable of the stem is assigned an accent. As a result, let us try to see how the form /úlya/ ‘to eat’ can be analyzed and see what the complications are.

- | | |
|--|--|
| <p>3. <i>ú</i> <i>ly</i> <i>a</i>
 Derived from: /u-l-i-a/ → [ulya]
 u <i>ly</i> a</p> | <p>‘to eat’
 Glide Formation
 Stem Accent Assignment</p> |
|--|--|

Note that in monosyllabic forms we observe that the first syllable of a stem also happens to be the ultimate syllable and that the segmental rules must be ordered before suprasegmentals. This motivated the application of glide formation rule before stem sccent assignment in (3). Consider the incorrect derivation when we motivate the accent assignment rule without modification in monosyllabic forms like [úlya] ‘to eat,’ as in (4) below that results in the unattested form in Meetto-Makhuwa *[ulyâ].

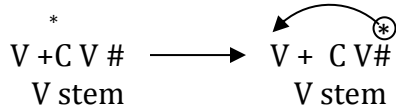
- | | |
|---|--|
| <p>4. $\begin{array}{c} * \\ u \text{ } ly \text{ } a \\ \\ \mathbf{LHL} \end{array}$</p> | <p>Stem Accent Assignment

 Accent-BTM Association</p> |
| <p>$\begin{array}{c} * \\ u \text{ } ly \text{ } a \\ \quad \diagdown \\ \mathbf{L} \quad \mathbf{HL} \end{array}$</p> | <p>Melody Association</p> |



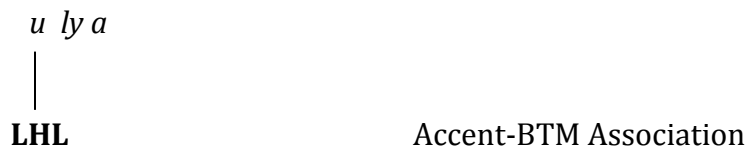
What this derivation suggests is that monosyllabic infinitives are not articulated in a low tone followed by a falling tone in Meetto-Makhuwa. Now let us look for an alternative analysis to handle tonal behaviour in verb stems with one syllable. In the literature on Meetto-Makhuwa, Ismail (2011) noted that the basic tone melody is LHL and that the accent is associated to the first syllable of the stem. As far as tone is concerned, we said that the accent is associated with H of the basic tone melody. Having surveyed the tonal behaviour of forms such as those in (2), it became clear that the infinitive has H tone instead of an L tone as is the case with other infinitives. Furthermore, the syllable of the stem, which also happens to be the final syllable, has an L tone. It seems here that the accent has been assigned to the syllable which appears again to be the ultimate syllable /*kwa*/. After that, the accent has hopped back onto the prefix /*u*/. Given this situation, we need a tonal rule to account for monosyllabic infinitives. Therefore, we introduce the *Ultimate Stem Accent Back Hopping* rule to account for Meetto-Makhuwa monosyllabic verb stems. The *Ultimate Stem Accent Back Hopping* rule can be stated in the following way:

Rule 2: Ultimate stem Accent Back Hopping



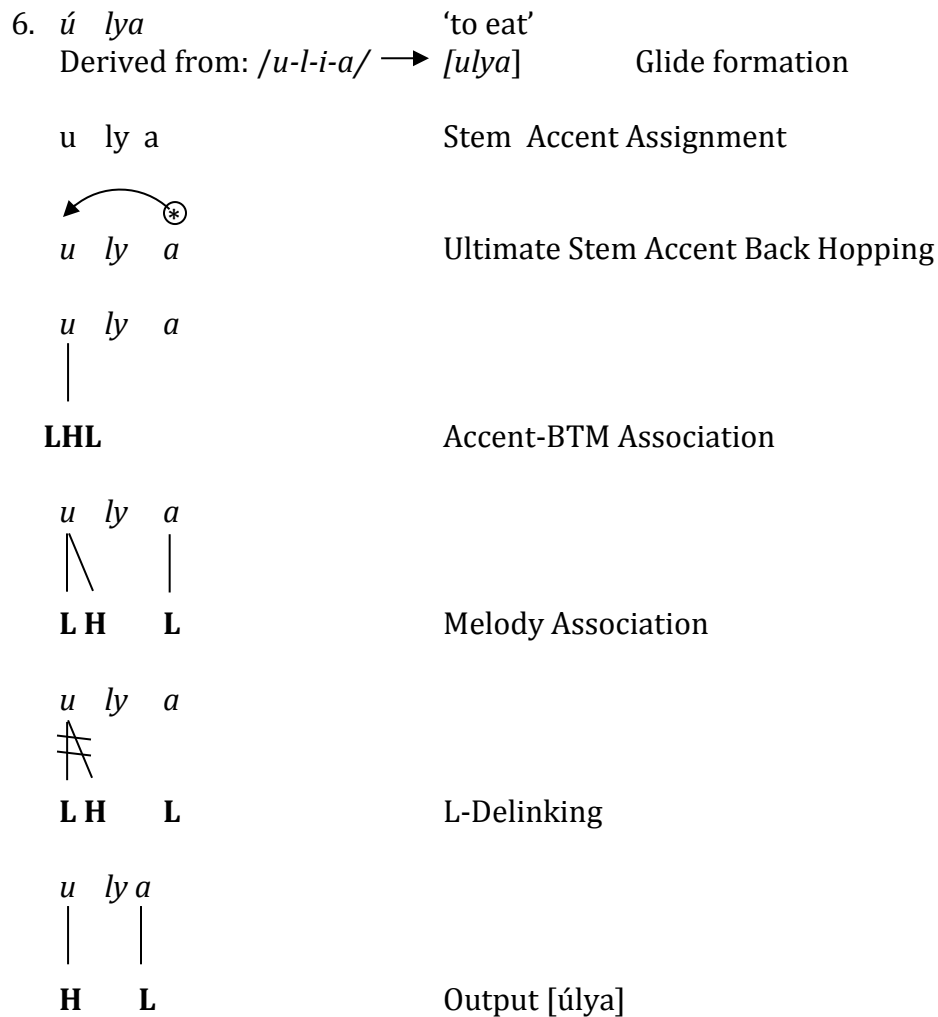
This rule says that the stem accent on the ultimate syllable hops back onto the immediately preceding syllable. Following this rule, the previous derivation can be reconsidered in the following way:

5. *ú ly a* 'to eat'
 Derived from: /*u-l-i-a*/ → [*ulya*] Glide formation

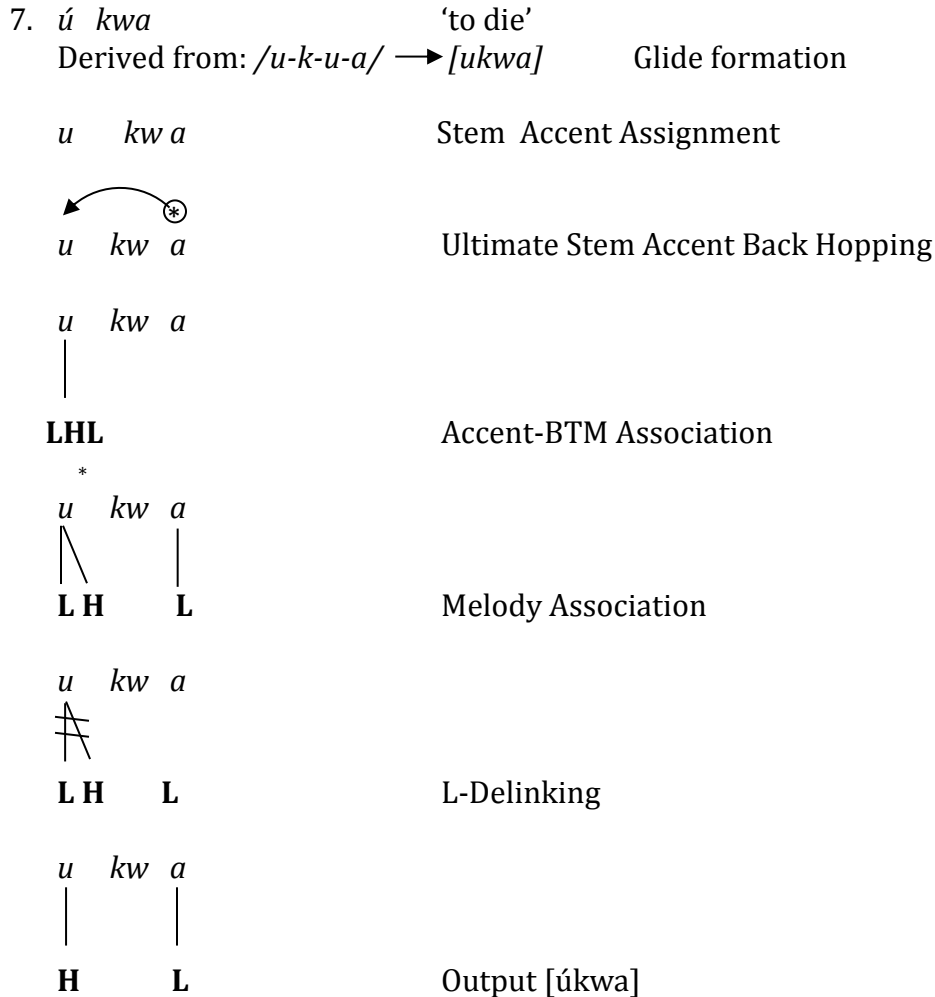




Clearly this derivation gives us the incorrect result [**ǔlya*]. The form in (5) suggests that an accentual approach to Meetto-Makhuwa monosyllabic infinitives is hardly achieved. Alternately, we can argue that after the application of melody association rule we may impose the L tone deletion from which a rising tone is delinked to just H tone. Following this proposal we will have the following derivation:

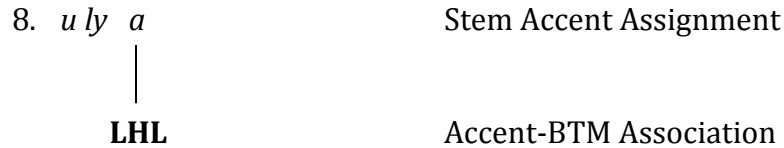


Consider further the following derivation in (7).



Again this derivation gives us the correct result [úkwa]. While it is fully appreciated that the theoretical description that employs accentual analysis has successfully handled the monosyllabic infinitives based to the data presented in this article, there is a concern which one can express regarding the descriptive power of accentual analysis of tone, particularly in the application of many tonal rules which create redundancies, unnecessary and sometimes even unnatural, as derivations (6) and (7) indicate. The source of these problems, in my opinion, is the application and the dependence of the use of Basic Tone Melody in any derivation strategies.

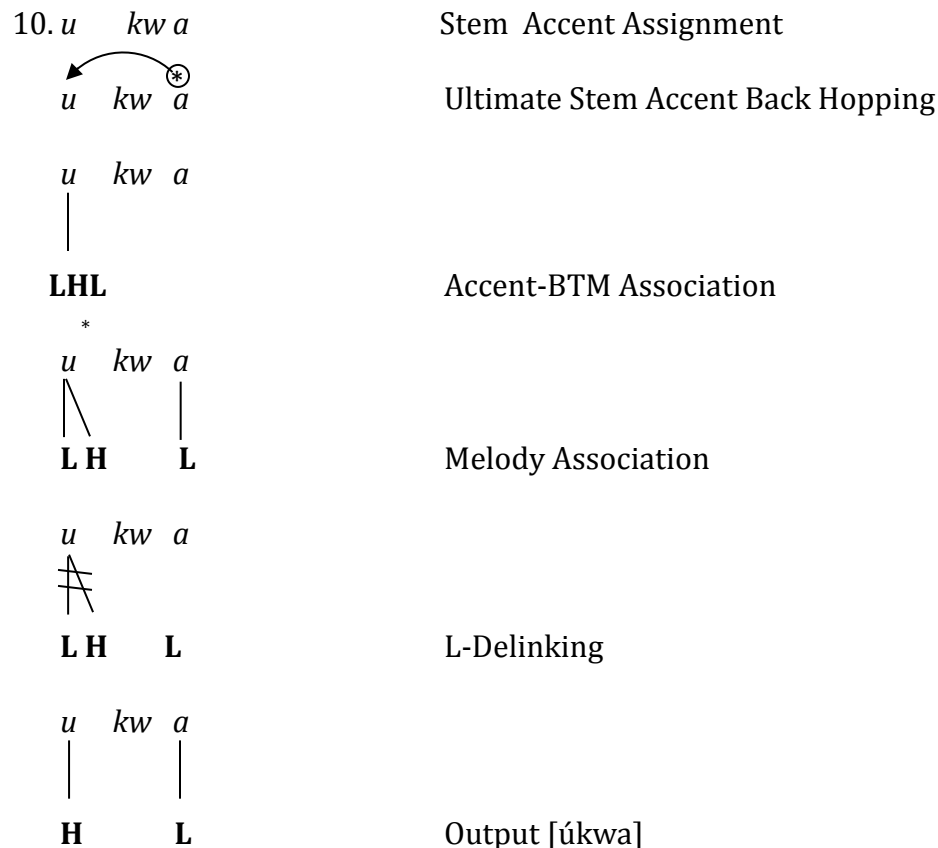
Although in this study, we did not establish the basic tone melody at the beginning of the description, it was assumed to be LHL. This conclusion is based on the data and tonal behavior observed in (1) and the general tendencies of tone in Meetto-Makhuwa data from the previous literature that draws the same conclusion (e.g. Ismail 2011). Having considered the monosyllabic infinitive forms in (2), there remains one issue in the analysis of tone which needs to be established concerning the association of one tone of the BTM and the association of a syllable of the stem with the accent.



Given what we see here, it is quite clear that accent is assigned to the first syllable of stem. All three tones of the BTM are involved and are motivating factors to the relevant vowel in the syllable. Here the vowel /a/ is associated with the H tone of /LHL/. We argue that this strategy is a source of the derivational program of tones in monosyllabic forms. The problems are created by associating melodies in the monosyllabic forms: The infinitives, which are short in length, create the possibility of motivating ill-formed outcomes, as in (9).



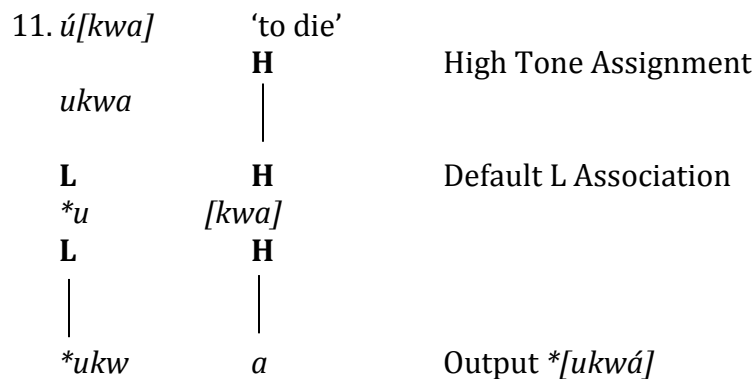
If we assume that one tone is associated with one specific syllable, the possibility of yielding a falling tone would have been avoided. To push the discussion further, we can now consider the application of the Ultimate Stem Accent Rule and that of L-Tone delinking, as demonstrated in (10).



In the derivation of (10), we see that the accent assigned to the first syllable of stem, which happens to be ultimate syllable, is now copied to the infinitive syllable /u/. This means that the basic tone melody is now linked to the /u/ of the infinitive, and the final vowel /a/ remains unassociated. When the Melody Association Rule is invoked, it results in a falling tone on the infinitive syllable /u/, which is unacceptable in Meetto-Makhuwa. In order to realize the acceptable form in this derivation, we must invoke a peripheral strategy, namely L-Tone Delinking in the position of a rising tone, which is unnatural. In this context, it can be argued that copying a low tone from the basic tone melody to the infinitive vowel and linking the leftmost L and H of the basic tone melody is superfluous and uneconomic linguistically. Therefore, the tonal rules that are involved in the accentual derivation of monosyllabic infinitives can be summarized as follows, arranged in the order in which they apply.

- a) Stem Accent Assignment
- b) Ultimate Stem Accent Back Hopping
- c) Accent Basic Tone Melody Association
- d) Melody Association
- e) L-Tone Delinking

The accentual approach that was proposed by Goldsmith (1976) was reanalyzed in purely tonal terms by assigning melodies in a particular vowel in a given syllable. Melodic high employs tone melodies, and some tonal processes that only apply to monosyllabic stems can be motivated by the assignment of the Melodic High. Let us now expand our discussion by considering this type of analysis in the following subsection. In the tonal analysis, the first aspect that is considered is the assignment of the Melodic High to a specific syllable. In Meetto-Makhuwa, for example, the first syllable stem is a source of derivation from which the Melodic High is assigned. Other tonal rules are assumed to be reorganisation rules originating from Melodic High. This assumption will apply, *inter alia*, if there are two or more syllable stems; otherwise, it may result in unacceptable forms in Meetto-Makhuwa. Consider the following derivation in (11).



assigned to the first syllable of the stem, and the second melodic high is assigned to the infinitive syllable /u/. In order to realize the acceptable form, the H of the infinitive is deleted by phrase-final H delinking rule. (13) Illustrates the derivation.

13. <i>ú[kwa]</i>	‘to die’													
<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding-right: 20px;">**H</td> <td>H</td> <td></td> </tr> <tr> <td style="padding-right: 20px;"><i>u</i></td> <td><i>kw</i></td> <td><i>a</i></td> </tr> <tr> <td style="padding-right: 20px;"> </td> <td> </td> <td> </td> </tr> </table>	**H	H		<i>u</i>	<i>kw</i>	<i>a</i>					High Tone Assignment			
**H	H													
<i>u</i>	<i>kw</i>	<i>a</i>												
<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding-right: 20px;">H</td> <td>H</td> <td></td> </tr> <tr> <td style="padding-right: 20px;"> </td> <td> </td> <td></td> </tr> <tr> <td style="padding-right: 20px;"><i>u</i></td> <td><i>kw</i></td> <td><i>a</i></td> </tr> <tr> <td style="padding-right: 20px;"> </td> <td> </td> <td> </td> </tr> </table>	H	H			 		<i>u</i>	<i>kw</i>	<i>a</i>					Phrase-Final H Delinking
H	H													
	 													
<i>u</i>	<i>kw</i>	<i>a</i>												
<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding-right: 20px;">H</td> <td>L</td> <td></td> </tr> <tr> <td style="padding-right: 20px;"><i>u</i></td> <td><i>kw</i></td> <td><i>a</i></td> </tr> </table>	H	L		<i>u</i>	<i>kw</i>	<i>a</i>		Default L Insertion						
H	L													
<i>u</i>	<i>kw</i>	<i>a</i>												
<i>u</i>	<i>kw</i>	<i>a</i>	Output <i>ú[kwa]</i>											

As we can see in this derivation, the assignment of two high tones has motivated the delinking of the H of the stem syllable in /a/. Following the later tonal rule—Default L Insertion—we now arrive at the correct result. This can also be achieved by motivating Melodic H on the infinitive syllable /u/, and the first tone on the first syllable of the stem can be delivered by Default L Insertion as below.

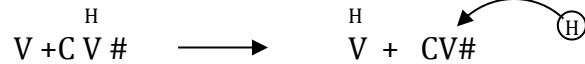
14. <i>ú[kwa]</i>	‘to die’										
<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding-right: 20px;">**H</td> <td></td> <td></td> </tr> <tr> <td style="padding-right: 20px;"><i>u</i></td> <td><i>kw</i></td> <td><i>a</i></td> </tr> <tr> <td style="padding-right: 20px;"> </td> <td> </td> <td> </td> </tr> </table>	**H			<i>u</i>	<i>kw</i>	<i>a</i>					High Tone Assignment
**H											
<i>u</i>	<i>kw</i>	<i>a</i>									
<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding-right: 20px;">H</td> <td>L</td> <td></td> </tr> <tr> <td style="padding-right: 20px;"><i>u</i></td> <td><i>kw</i></td> <td><i>a</i></td> </tr> </table>	H	L		<i>u</i>	<i>kw</i>	<i>a</i>		Default L Insertion			
H	L										
<i>u</i>	<i>kw</i>	<i>a</i>									
<i>u</i>	<i>kw</i>	<i>a</i>	Output <i>ú[kwa]</i>								

In (14) we observe that two tonal rules have been employed to realize the acceptable forms in Meetto-Makhuwa, whereas (13) has employed three tonal rules; thus, this approach is uneconomic tonal derivational. This is built on the principle that the Melodic High is assigned to the first syllable of the stem in Meetto-Makhuwa, and it remains odd when the syllable /a/, which is the first syllable of the stem, has not yet been associated with any melody in its initial tonal rule application. This means that we need to find an alternative approach that will take care of the theoretical issues while resulting in an acceptable form through derivational processes.

What seems to be the case tone in monosyllabic infinitives is that the Melodic High tone (H) is linked to the first syllable of stem. After that, that H has hopped back

onto the prefix /u/. As a result, the need arises for a tonal rule to account for such a state of affairs. Therefore, we introduce the *Ultimate Melodic High Back Hopping* rule to account for monosyllabic verb stems in Meetto-Makhuwa that can be stated as:

Rule 3: Ultimate H Tone Back Hopping



This rule says that the Melodic High on the ultimate syllable hops back onto the immediately preceding syllable. Thus, we can now return and consider two of the examples from (2), in order to illustrate how the rule works, as in (15) and (16).

<p>15.</p> <p style="text-align: center;">H</p> <p style="text-align: center;">u kw a</p> <p style="text-align: center;"> </p> <p style="text-align: center;">H ← H</p> <p style="text-align: center;"> </p> <p style="text-align: center;">u kw a</p> <p style="text-align: center;">H ← H</p> <p style="text-align: center;"> †</p> <p style="text-align: center;">u kw a</p> <p style="text-align: center;"> </p> <p style="text-align: center;">H L</p> <p style="text-align: center;">u kw a</p>	<p>High Tone Assignment</p> <p>Ultimate H Tone Back Hopping</p> <p>H Tone Delinking</p> <p>Default L Insertion</p> <p>Output <i>úkwa</i></p>
<p>16.</p> <p style="text-align: center;">H</p> <p style="text-align: center;">u ly a</p> <p style="text-align: center;"> </p> <p style="text-align: center;">H ← H</p> <p style="text-align: center;"> </p> <p style="text-align: center;">u ly a</p> <p style="text-align: center;">H ← H</p> <p style="text-align: center;"> †</p> <p style="text-align: center;">u ly a</p> <p style="text-align: center;"> </p> <p style="text-align: center;">H L</p> <p style="text-align: center;">u ly a</p>	<p>High Tone Assignment</p> <p>Ultimate H Tone Back Hopping</p> <p>H Tone Delinking</p> <p>Default L Insertion</p> <p>Output <i>úlya</i></p>

In this case, there is an H on the first syllable of the stem which happens to be the ultimate syllable. In such a case, the H tone moves from the first syllable of the stem onto the preceding syllable, which is the infinitive; thus, the WFC requirements applies. What the above illustrations show is that with the application of melodic high analysis, the following ordering of rules has to be followed in order to arrive at the surface representation in monosyllabic forms:

- a) High Tone Assignment
- b) Ultimate Stem High Back Hopping
- c) Final High Delinking
- d) Default L Tone Association

As a result, we observe the application of four tonal rules in order to get acceptable forms in monosyllabic tonal derivations in Meetto-Makhuwa.

4. CONCLUSION

This study has mainly discussed the tonal behavior of monosyllabic infinitives in Meetto-Makhuwa and how the tones are realized at the phonetic level. It has been shown that the tonal in monosyllabic infinitives can be analyzed in both approaches, namely accentual and melodic highs. In the accentual approach, we have noted that many tonal rules may yield redundancies. In the melodic approach, we have noted that the application of fewer tonal rules does not require repetition and the unnecessary application of tonal rules, thus maintaining not only brevity but also linguistic simplicity in tonal rule application.

Furthermore, we noted that in order to adhere to the well-formed condition in Meetto-Makhuwa, a number of tonal rules were required. First, there are accent Reorganization Rules (e.g. *Ultimate Stem Accent Back Hopping*). Finally, there are tonal rules that are necessary in the reorganization of tones to give them the required shape. It is suggested that there is no general, complete approach with more descriptive power than another. What matters is the type of language that data may suggest on the basis of the theoretical framework to be employed. This assumption should not be taken in a blind way, i.e. by ignoring the current tonal theory as stated in optimality and optimal domain theory. This will still be the way forward in the development of phonological theory.

REFERENCES

- Cassimjee, F. 1986. *An Autosegmental Analysis of Venda Tonology*, Unpublished Ph.D. Dissertation, University of Illinois at Urbana-Champaign.
- Goldsmith, J. 1976. *Autosegmental Phonology*. Ph.D. Dissertation, MIT.
- Guthrie, M. 1948. *The Classification of the Bantu Languages*. Dowsons of Pall Mall, London.
- Ismail, J.H. 2000. *Aspects of Makuwa Phonology*. Unpublished M.A. Thesis, University of Dar es Salaam, Tanzania.
- . 2011. *A Tonological Study of Meetto-Makhuwa of Southern Tanzania*. Unpublished Ph.D. Dissertation, University of Dar es Salaam.
- Languages of Tanzania Atlas*. 2009. University of Dar es Salaam.

- Marlo, M. 2007. *The Verbal Tonology of Lumarachi and Lunyala-West: Two Dialects of Luyia (Bantu, J.30, Kenya)*. Ph.D. Dissertation, University of Michigan.
- Massamba, D.P.B. 1984. "Tone in Ci-Ruri" In Clements, G. N and J. Goldsmith, in *Autosegmental Studies in Bantu Tone*, 235-254. Dordrecht: Foris Publications.
- . 2010. *Phonological theory: History and development*, Institute of Kiswahili Studies, University of Dar es Salaam, Tanzania.
- Mwita, L.C. 2008. *Verbal Tone in Kuria*. Unpublished Ph.D. Dissertation, University of California, Los Angeles.
- Odden, D. 2006. "Topics in Taita Tone II," in *Studies in African Linguistics* 35: 33-72.