Autosegmental Accent

AUTOSEGMENTAL ACCENT

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There are three basic ways that tones can be assigned to tone-bearing units: 1) Tones may be present in lexical entries. In such cases, autosegmental conventions and rules will result in the appropriate tone assignments. 2) In lexical entries, 'tonal' information is conveyed not by tones, but by accentual diacritics; at some point in the derivation, tonal melodies are then assigned to such diacritics. Under such an approach, rules may be of two basic types: i) accentual rules may move, delete or insert accentual diacritics, ii) tonal rules of the regular autosegmental kind may apply after the assignment of tonal melodies. In principle, a tonal rule may refer to 'accentual' properties. 3) Lexical entries may contain no tonal information at all. Prosodic structure of a metrical kind (trees or grids) is assigned to the phonological string, and tones are introduced during the interpretation of metrical structure.

In this paper, I will argue that the second of these three ways of assigning tones should be eliminated from phonological theory. First, it will be shown that to allow a diacritic accent approach, phonological theory in general must be considerably weakened. Second, a case study will be presented of Tonga, a language that has been argued to require accentual diacritics. It will be shown that a purely tonal analysis of Tonga has both

theoretical and descriptive advantages over a diacritic accent approach.

One of the most interesting claims of autosegmental theory is that in a high percentage of cases, the linkings between tones and tone-bearing units are predictable. This claim is expressed in the 'association conventions', the precise formulation of which is a matter of some discussion. (See Williams 1971, Goldsmith 1976, Clements and Ford 1979, Halle and Vergnaud 1982, Pulleyblank 1983a, b.) In cases where the linking of a tone to a tone-bearing unit is not predictable, the simplest and least powerful mechanism for bringing about the exceptional linking is to pre-link the elements concerned -- that is, in exceptional cases, tones will be lexically linked to a tone-bearing unit or units.

Turning to metrical theory, it has been shown (eg. Hayes 1980) that in many cases syllable structure plays an important role in triggering the construction of metrical trees or grids. It has also been shown, however, that a representation of syllable structure alone is insufficient for the correct assignment of metrical structure. In exceptional cases, certain syllables must be diacritically marked to trigger the same metrical rules triggered in a regular fashion by a phonologically definable class of syllables.

The question for tonal accent systems is the following: Can we consider the evidence for diacritics in metrical systems as motivation for the introduction of diacritics into autosegmental systems? The answer to this question is no. Consider a case such as the following example from Luganda (Hyman 1983): àbàpákàsì 'porters'. If the location of the underlying 'accent' is indicated by a diacritic, then the appropriate underlying form for this example would be as in (1a). If, however, the 'accent' is represented by a pre-linked tone, then the representation would be as in (1b).

(1) a. a ba pákas i b. a ba pakas i
H

Given a diacritic approach, the form àbàpákàsì could be derived by assigning a LHL melody (as in 2a) and then assuming linking conventions that would give the representation in (2b).

(2) a. a ba pákas i melody assignment

L H L

b. a ba pákas i linking conventions

L H L

Assuming a pre-linking approach, one could simply assume that any tone-bearing unit not otherwise assigned a tone would be interpreted as L (Pulleyblank 1983a, b). Hence (1b) would end up as in (3):

(3)
a	ba	pakas	i
|	|	| |	|
L	L	H L	L

Returning to the question of autosegmental diacritics, it seems that the use of diacritics in (1a) and (2) is analogous to the pre-linking of tones; there is no obvious similarity in function with the 'head'-marking diacritics that trigger foot formation and the diacritics in (2) that serve to align tones and tone-bearing units. The question that arises, therefore, is whether two types of exception features -- pre-linking and diacritic accents -- are required for autosegmental theory. In this respect, it is important to note that pre-linking is an inherently less powerful device than the 'accents' seen in an example like (2). With 'pre-linking', one can only assign exceptional association lines morpheme-internally. One cannot pre-assign a tone in morpheme A to a tone-bearing unit in morpheme B if the A B sequence is derived in the morphology. On the other hand, an exceptional linking of that type is easily derived using accents:

(4)
$$\underset{A}{\left[\ldots \underset{*}{\underline{V}} \ldots\right]}\ \underset{B}{\left[\ldots \overset{*}{T} \ldots\right]}$$

Such cases can be ruled out by some convention in an accentual approach but are inherently impossible if only using pre-linking. Similarly, an accentual approach to exceptional linkings allows the possibility of referring to accents in a language's tone rules. This additional power is unavailable if exceptional linkings are established by pre-linking.

It would seem, therefore, that the use of diacritic accents should be avoided unless it can be demonstrated that less powerful devices such as pre-linking are not sufficient to account for cases of unpredictably located tonal linkings.

Following Hyman (1983), it has been assumed that a linked H-tone is the marker of 'accent' in Luganda examples such as that given in (1b). This position is only possible within a version of autosegmental theory where tone spreading does not occur automatically as a result of universal association conventions. If one were to assume automatic spreading (Williams 1971, Goldsmith 1976, Clements and Ford 1979) then a representation such as that in (1b) would result in a * HHHHH sequence. Hence the theory of tonal accent being presented in this paper requires that one adopt a version of the association conventions where spreading is not

automatic (Halle and Vergnaud 1982, Pulleyblank 1983a, b).

Goldsmith (1981) points out that autosegmental accents are not subject to subordination -- that is, there may be two or more accents of equal prominence. Moreover, diacritic accents are not inherently limited to one occurrence per word. This is quite different than the case that obtains in stress languages, where typically there will be only one primary stress per word -- any non-primary stress being of lesser prominence (Note Hyman 1978 and references there). In a metrical analysis, the nature of metrical structure predicts accent subordination since there will be a unique head within any given metrical domain. Autosegmental representations, on the other hand, predict lack of subordination since all autosegments are of an equal status[1]. Therefore with respect to subordination, there again appears to be no reason to enrich the autosegmental framework by the introduction of diacritic accents. To the extent that subordination exists, this appears to be an argument for a metrical approach; and to the extent that subordination does not exist, autosegmental theory without accents is adequate.

Nevertheless, there do appear to be languages where a single tonal 'accent' is possible per 'accentual' unit. Can such cases be construed as arguments for accentual diacritics? The answer is no. In an analysis that assumes diacritics, but does not assume metrical structure, there is no reason for assuming one diacritic per accentual unit. Hence the grammar must include a stipulation to that effect. Such stipulations are not uncommon in non-accentual 'tone' languages. For example, it is common in Niger-Congo languages that verbs may bear at most a single tone no matter how many syllables in the verb stem. One such case is Tiv (Pulleyblank 1983a, b).

Imagine that we are confronted with a language exhibiting two surface tones, H and L, and where the patterns LL, LH and HL are possible on disyllabic nouns, but not * HH. This tonal distribution could be accounted for accentually by assuming that the three possible patterns are: VV, V́V and V̋V, and that no word may bear two accents. The same distribution could be accounted for tonally if we assume that the possible patterns are represented

as: VV, VV and VV; L-tones are assigned by default, and no word
   | |
   H H
may bear two lexical tones. Clearly, distributional constraints in themselves are not sufficient for determining that a language is 'accentual'.

In Chomsky and Halle (1968), it is proposed that phonological rules of the type shown in (5) should be disallowed in the construction of grammars.

(5) $A \rightarrow B\ C \ / \ P \_\_\_ Q$

But the rules assigning tonal melodies to diacritic accents are rules of precisely this sort. The structural description of tone melody assignment is an accented unit, and the structural change consists of assigning a sequence of tones to such a unit:

(6) $\overset{*}{V} \rightarrow \begin{matrix} \overset{*}{V} \\ | \\ H\ \overset{*}{L} \end{matrix}$

Hence such rules should only be allowed if it can be demonstrated that the tonal sequence constitutes some type of single unit. As far as I can tell, there is no evidence that would support such a claim in the languages for which diacritic accent analyses have been proposed.

To allow the assignment of sequences of tones to a single element because such sequences constitute some sort of 'tonal melody' opens up the possibility of all manner of rules that would violate the condition prohibiting rules of the type shown in (5). For example, epenthesis rules could insert 'core melodies' as in (7):

(7) $\emptyset \rightarrow V\ C \ /\ C\ \_\_\ V]$

They could also insert harmony melodies as in (8):

(8) $\overset{*}{C} \rightarrow \begin{matrix} \overset{*}{C} \\ | \\ [+back]\ [-back]\ [+back] \end{matrix}$

Without imposing severe constraints on the types of sequences that can legitimately constitute 'prosodic melodies', to allow tonal melodies results in a considerable weakening of phonological theory.

If melodies cannot be a primitive, underived notion, then they must be the result of tonal rules. For example, 'melodies' of the types shown in (9) can be derived by pre-linking a tone and assigning a second tone by a rule of epenthesis -- assuming that default rules, etc. would not have derived the melody without special epenthesis rules.

(9) a. $\overset{*}{F}$ b. $G\ \overset{*}{F}$ c. $\overset{*}{F}\ G$ d. $G\ \overset{*}{F}\ H$

On the other hand, melodies like those in (10) could not be derived by any single rule of epenthesis, unless such a rule was of the prohibited type shown in (5).

(10) a. $\overset{*}{F}\ G\ H$ b. $G\ H\ \overset{*}{F}$ c. $G\ H\ \overset{*}{F}\ I\ J$

By requiring that complex melodies must be derived by rules, we predict that the melodies of (10) will be highly marked --

compared to those in (9) -- since the melodies in (10) would require more than one rule in their derivation. And from the cases discussed in work by Goldsmith (1981, 1982), Clark (1982), Halle and Vergnaud (1982), Odden (1982), etc., this prediction seems to be correct, as there have been no melodies proposed in such work that would correspond to the cases in (10).

As a final point, it has been suggested (Hyman 1978) that in 'tone' languages, tones behave in a relatively symmetric fashion, whereas in 'accent' languages, one tone (generally the H-tone) has some special status. There are two points to be made concerning this suggestion. First, it has been argued (eg. Pulleyblank 1983b) that asymmetrical behaviour of different tones is attested even in 'tone' languages like Yoruba, Tiv and Margi. Secondly, the tonal asymmetry observed in a language exhibiting accent-like properties can be accounted for by a theory of tonal underspecification (pointed out in Hyman 1983); there is no need to introduce diacritic accents. According to the theory of underspecification proposed in Pulleyblank (1983b), the underlying accent in a language like Tonga can only be an underlying H-tone. Lexical entries will therefore include vowels that are linked to a H-tone, and vowels that are underlyingly toneless. It follows that rules of spreading, etc. will treat H-tones differently from L-tones since rules affecting H-tones may apply prior to the introduction of L-tones, while rules affecting L-tones can only apply after the application of default tonal rules -- and therefore to a fully specified string.

Turning to Tonga, Meeussen (1963) showed that syllables belong to either of two tonal classes: a 'marked' class and an 'unmarked' class. Once syllables have been assigned to the appropriate class, it is possible to derive the various nominal and verbal forms observed in that language. At issue with respect to autosegmental theory is how to characterize the two tonal classes. Should the marked class be identified by the assignment of a diacritic accent? Or should it be identified by a pre-linked tone? One point should be stressed: no more than two classes are necessary. This is accounted for by Goldsmith (1981) by characterizing the marked class as accented (ie. as diacritically marked) and the unmarked class as unaccented. In the version of autosegmental theory being argued for here, this possibility is not available since it requires complex melodies. The logical approach is therefore to indicate the marked class by the presence of a pre-linked tone. The question to be adressed is whether such a pre-linked tone should be H or L. This question is particularly interesting with respect to Tonga; unlike what is probably the general pattern cross-linguistically -- where an 'accent' generally involves a H-tone -- a 'marked' syllable in Tonga is associated with a L-tone. Both Goldsmith (1981) and Halle and Vergnaud (1982) propose that an accented syllable is associated with the L of a HL melody. In a pre-linking approach, can it therefore be said that an accent is a pre-linked L-tone in Tonga? There are both theoretical and empirical reasons for rejecting such an approach. First, there is clear evidence that L is the

default tone in Tonga (Halle and Vergnaud 1982) -- that is, when a syllable is not otherwise assigned a tone, it will surface on a L-tone; so H is the marked value for the tonal feature. In the theory of feature underspecification developed in Kiparsky (1982) and Pulleyblank (1983b), only marked values for features are allowed in lexical entries. For Tonga, this means that H, but not L, can be present in lexical entries. Hence an accent in Tonga must be a pre-linked H-tone. To sum up, a restrictive theory of phonology that disallows rules of the form given in (5) requires that we abandon the diacritic accent/tonal melody approaches taken for Tonga by Goldsmith (1981) and Halle and Vergnaud (1982); in addition, the restricitve theory of underspecification proposed in Kiparsky (1982) and Pulleyblank (1983b) requires that the pre-linked tone in a language like Tonga be a H-tone -- in spite of earlier proposals that link L-tones to an accented Tonga syllable. Hence Tonga provides an important test for the theories under discussion. In the following sections, I will try to show that Tonga not only passes this test, but that the restrictive theories being argued for here account for certain facts that were left unexplained in earlier accounts of Tonga.

When all syllables of a noun are unaccented -- both stem and prefixes -- then we obtain tone patterns like the following:

(11)	a.	ì mù ntù	'person'
	b.	ì dà	'stomach'
	c.	ì bà sànkwà	'boys, men'

Following a suggestion by Halle and Vergnaud (1982), I will assume that the L-tones in (11) are default values. I differ from Halle and Vergnaud, however, in assuming the default value to be an autosegment introduced by the following rule supplied by Universal Grammar.[2]

(12) Default L-insertion: $\textcircled{V} \rightarrow \begin{matrix} V \\ | \\ L \end{matrix}$

This rule will apply to a form such as that in (13a) to derive (13b):

(13)	a.	i mu ntu	b.	i mu ntu	(=11a)
				| | |	
				L L L	

When one of the stem vowels is accented, we obtain tonal patterns such as the following (accented vowel is underlined):

(14)	a.	í bú sì	'smoke'
	b.	í cí tō̲ngà	'Tonga customs, language'
	c.	í má kā̲nì	'news, affairs'

(15) a. í mú símbì 'girl'
b. í mú súnè 'ox'
c. í mú lálà 'mamba'

It is clear from pairs such as í+bú+sì 'smoke': ì+bù+sù 'flour' that the H-tones that appear on nominal prefixes in certain cases arise as a function of a property of the stem -- they are not inherent. Since, by hypothesis, an accent is a pre-linked H-tone, this means that examples like (14c) and (15a) must have representations like the following:

(16) a. [i [ma [kani]]] (=14c) b. [i [mu [simbi]]] (=15a)
H H

To derive the correct surface forms, two rules must apply. First, the H-tone must spread to all toneless vowels to its left:

(17) a. i ma kani b. i mu simbi H-spread
H H

Second, the rightmost association line must be deleted:

(18) a. i ma kani b. i mu simbi Delinking
H H

Default L-insertion (12) will then apply to derive the correct surface forms ímákànì and ímúsímbì:

(19) a. i ma kani b. i mu simbi Default L-insertion (12)
H L L H L

The rules of H-spread and Delinking can be formalized as follows:

(20) H-spread: (V) V
H

(21) Delinking: V V → V V
H H

The effect of these two rules is to derive the HL 'melody' proposed in the work of Goldsmith (1981) and Halle and Vergnaud (1982). A couple of points are relevant in this regard. First, there is evidence that even floating tones do not spread automatically (Pulleyblank 1983a, b). This means that even an approach that allowed a HL melody for Tonga would require a rule whose effect would be equivalent to H-spread. Second, an analysis including the rule of Delinking (21) makes different predictions

in certain cases from an analysis in which accented vowels are directly assigned a L-tone. An analysis including Delinking predicts that in a configuration where a pre-linked H-tone cannot spread, it will not be delinked; in such a configuration the accented vowel will therefore surface with the H-tone that it bears underlyingly. It will be demonstrated below that this prediction is indeed borne out.

In this section, I will discuss three types of cases: 1) cases where Goldsmith (1981) argued for accentual rules, 2) cases where a rule seems to refer to both tone and accent, and 3) cases where an accented vowel surfaces with a H-tone. In all cases, it will be shown that a purely tonal analysis is at least as satisfactory as an accentual one, and in some cases clearly to be preferred.

Verb bases in Tonga fall into two classes. The first class bears a lexical 'accent' while the second does not. What is striking about the accented class, however, is that the accent is always on the first vowel of the verb base.

(22) Toneless verbs ('unaccented')

a.	lang	'look at'
b.	tobel	'follow'
c.	yandaul	'look for'

(23) H-tone verbs ('accented')

a.	bon | H	'see'
b.	silik | H	'care for'
c.	swiilil | H	'listen to'

An accentual analysis can only account for the location of the H-tone by stipulation. A tonal approach, on the other hand, can account for such facts by assuming that the H-tones present in such verb forms are unlinked in underlying representation -- the minimal assumption anyway since pre-linking is only resorted to when linkings are not by convention. In each case, therefore, the H-tone will be associated to the first vowel by the normal left-to-right association conventions. This is a strong argument for a tonal analysis of Tonga. It allows the following characterization of verb bases:

(24)

σ-	(σ)	(σ)
	(H)	

Verbs are of one or more syllables, with or without a lexical H-tone.

Before proceeding to the arguments for or against accentual rules, I will briefly discuss a rule that will be necessary for an understanding of later examples. In finite verbal forms, Goldsmith (1981) shows that there is a rule that deletes an initial H-tone:

(25) Initial H-deletion: $H \rightarrow \emptyset \; / \; [_{Verb}$——

For example, the difference between H-toned stems and toneless stems is neutralized in cases like the following:

(26) a. tu la lang a 'we look for'
b. tu la bon a 'we see'
H

In (26a), the verb stem lang is toneless, while in (26b), the stem bon bears a H-tone. But the H of bon is deleted by Initial H-deletion so the surface forms of both cases have L-tones throughout: tùlàlàngà, tùlàbònà.

The first 'accentual' rule of Goldsmith's analysis that I will examine is Meeussen's rule. According to Goldsmith this rule deletes the second accent in a sequence of two accents prior to the insertion of tone melodies. Using $\overset{*}{V}$ to indicate an accented vowel and $\overset{o}{V}$ to indicate an unaccented vowel, this rule can be formalized as:

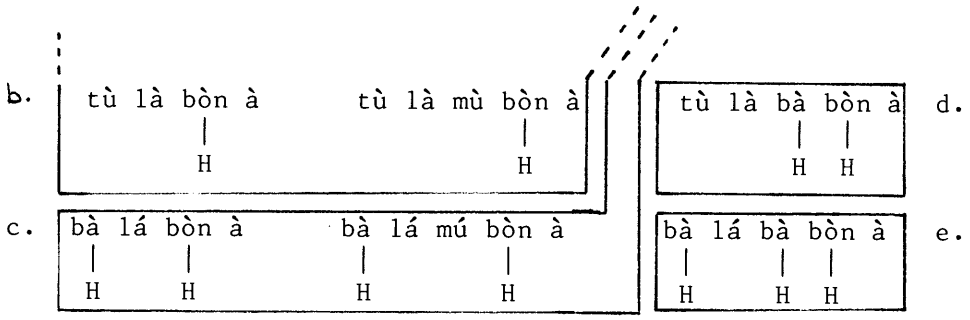
(27) Meeussen's rule: $\overset{*}{V} \rightarrow \overset{o}{V} \; / \; \overset{*}{V} \; C_o$ ——

Equivalent to this accentual formulation is a strictly tonal rule such as the following:

(28) Meeussen's rule: $H \rightarrow \emptyset \; / \; \underset{|}{V} \; C_o \; \underset{|}{V}$
H ——

By ordering this rule before H-spread (20) and Delinking (21), the correct results are obtained in those cases that require Meeussen's rule. Consider for example the Indicative Present Affirmative Strong tense (Tense 8):

(29) a. tù là làng à tù là mù làng à tù là bà làng à b.
H
b. bà là làng à bà là mù làng à bà lá bà làng à c.
H H H H



The morphological structure of this tense is as follows:

(30) [Subject [Tense Marker [(Object) [[Verb stem] Final Vowel]]]]

The examples in (29) show the various combinations that result with H-tone and toneless subject prefixes (tu 'we': ba 'they'), H-tone and toneless object prefixes (mu 'him, her': ba 'them') and H-tone and toneless verb stems (lang 'look at': bon 'see'). In the box labeled "a", there are no lexical tones present; consequently such words surface with a sequence of L-tones after Default L-insertion (12). All the cases in box "b" bear a single lexical H-tone; Initial H-deletion (25) removes the H-tone in each case, hence a L-tone pattern results as in box "a". The examples in boxes "c", "d" and "e" follow in a straightforward fashion from the rules discussed above:

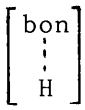
(31)

c)	d)	e)	
ba la bon a H H	tu la ba bon a H H	ba la ba bon a H H H	
N/A	tu la ba bon a H Ø	ba la ba bon a H H Ø	M's Rule (28)
ba la bon a H H	tu la ba bon a H	ba la ba bon a H H	H-spread (20)
ba la bon a H H	tu la ba bon a H	ba la ba bon a H H	Delink. (21)
ba la bon a Ø H	tu la ba bon a Ø	ba la ba bon a Ø H	Init. H-deletion (25)

After Default L-insertion, we end up with the correct results: bàlábònà, tùlàbàbònà and bàlábàbònà. Two points should be stressed with respect to these cases. First, as noted above, there is no reason to view Meeussen's rule as accentual. Rules of tone deletion are common in tone languages. Second, the above analysis does not require that the lexical H-tones in (20) be pre-linked. The various associations follow completely from the universal association conventions in conjunction with cyclic tone

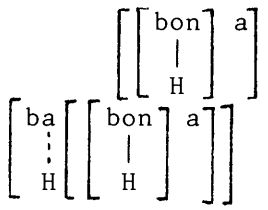
association. Consider for example the derivation of the example in (31e). On the first cycle, the H of the stem links:

(32) a.



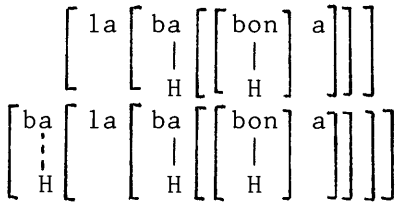
On the second cycle, nothing happens and on the third cycle, the H of the object prefix links:

b.



On the fourth cycle, nothing happens and on the fifth cycle, the H of the subject links:

c.



As we will continue to see below, not only are accent diacritics not necessary in Tonga, but most of the tonal association lines are completely predictable.

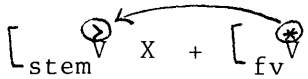
There is an interesting class of tenses that I will exemplify here by means of the Remote Dependent Affirmative (Tense 6). In this tense, toneless stems surface with a H-tone on the first vowel of the stem, while H-tone stems surface with the expected H-tone pattern. Consider forms like the following:

(33) a. tù ká láng è
b. tù ká tóbèl è
c. tù ká yándàùl è

(34) a. tù ká bòn è
b. tù ká sìlìk è
c. tù ká swììlìl è

To account for such tenses, Goldsmith (1981) assumed that underlyingly there is an accent on the final vowel. In addition, he proposed the following rule:

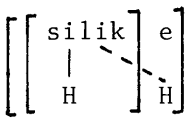
(35)



The accent on the final vowel shifts leftward onto the first vowel of the stem; it becomes a post-accent and immediately shifts one vowel to the right. ($\vec{V}$ indicates a post-accenting vowel.)

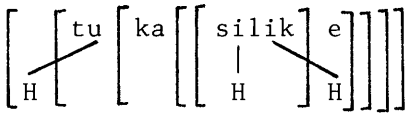
Within the analysis of this paper, such a tense can be accounted for straightforwardly by assuming that there is a free H-tone introduced morphologically with the final vowel. This free H-tone will then link by the normal association conventions. Consider first the case of a H-tone stem. On the first cycle, the H-tone of the stem will associate. On the second cycle, the free H-tone of the suffix will associate by left-to-right convention, as illustrated in (36a):

(36) a.



Prefixes will subsequently be added, giving:

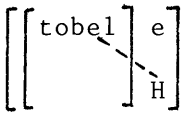
b.



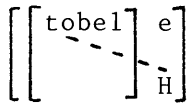
Note that in this tense, subject prefixes are always 'accented' -- hence the initial H-tone prefix. Meeussen's Rule (28) will apply regularly to delete the H that was introduced with the final vowel and the rules discussed above will correctly derive tùkásìlìkè.

Turning to the case of toneless stems, we must account for the fact that when the H-tone suffix is added, the free H-tone links to the second vowel of the stem rather than the first:

(37) a.

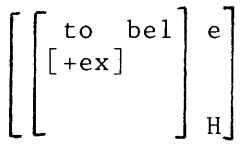


b. *



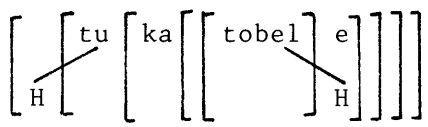
This result can be obtained by marking the first vowel of a toneless stem as extratonal (Hayes 1980, 1982, Harris 1983, Pulleyblank 1983b). That is, the first syllable of a toneless stem will be excluded from consideration by the tonal rules. Hence prior to tone association, the representation in (37) would actually be as in (38).

(38)



Tone association would derive the form given in (37a) and subsequent affixation would derive:

(39)



Tonal rules would proceed regularly to derive tùkátóbèlè. Note that as soon as the tense prefix ka- is added, tobel loses its

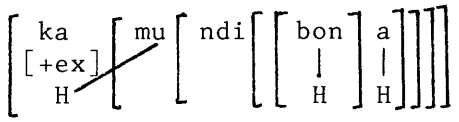
extratonality since the extratonal syllable is no longer at the periphery of the tonal domain.

The important point about such cases is that there is no reason to posit special accentual rules. On the contrary, the mobility of the 'accent' follows automatically from the universal association conventions if the 'accent' is in fact a tone.

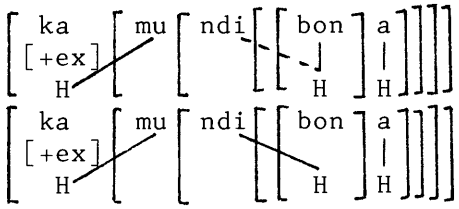
The distinguishing characteristics of tenses with a 'stable final vowel accent' are that 1) the final vowel is 'accented' and 2) the final 'accent' is not subject to Meeussen's rule. I propose to account for the first fact by assigning a H-tone to the final vowel by a morphologically conditioned rule. The second fact is accounted for by ordering the rule of H-tone assignment after Meeussen's rule. Consider the following example from the Hortative Affirmative (Tense 2):

(40) a. 

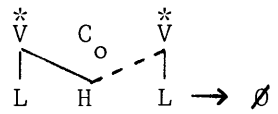
Note first of all that in this tense (as in the Remote Dependent Affirmative), the subject prefix is always H. This is accounted for by marking the tense prefix ka- as extratonal but bearing a H that will link to the next syllable. The following rules will now apply to the representation in (40a). First, Meeussen's rule applies, but in (40a) its structural description is not met. Second, the morphologically conditioned rule of H-assignment applies to derive:

b. 

H-spread (20) and Delinking (21) apply as follows:

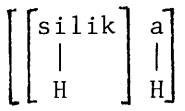
c. 

Initial H-deletion (25) and Default L-insertion (12) will also apply to derive the correct form kàmùndíbónáʒ. Note that since the final H is not multiply linked, it is immune to the effects of Delinking. Such tenses were problematic within the accentual framework of Goldsmith (1981) since an accented vowel was assigned a L-tone and yet surfaced in this class of tenses with a H. A fix-up rule was required, such as the following (Goldsmith 1981):

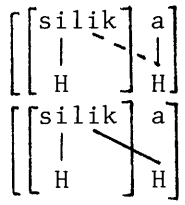
(41) Double-Accent Flop : 

As we have seen, however, there is no reason to invoke accents to account for such tenses. Moreover, such tenses support the claim made in this paper that a H-tone 'accent' linked to a single vowel will surface as H.

The last case that I will consider in this paper is an imperative form such as sílíkà. In this example, the stem bears a H-tone, and the imperative marker itself is a H-tone -a final vowel:

(42) a. 

H-spread (20) and Delinking (21) apply as follows:

b. 

Since the Imperative is not one of the class of tenses where Initial H-deletion applies, Default L-insertion applies to derive sílíkà.

In an accentual approach, the Imperative presents a problem analogous to that encountered in the Hortative Affirmative; an accented syllable surfaces with a H-tone rather than a L-tone. Double-Accent Flop (41) would not resolve the situation so another fix-up rule would have to be introduced. I suggest that the Imperative is simply another case that illustrates that 'accents' are actually underlying H-tones in Tonga. Whenever a H is linked to a single vowel, the vowel simply surfaces as H.

In conclusion, it has been shown that within a constrained version of autosegmental theory, diacritic accents must be excluded. The diacritic accent approach is excluded, moreover, by a general constraint proposed in Chomsky and Halle (1968). Turning to the consequences of such a proposal for Tonga, it has been demonstrated that accents are not in fact required for a description of that language. Rules referring to accents can either be reformulated in terms of tones, or dispensed with entirely.

Notes

1. It is of course possible that phonetic values of tonal autosegments in certain configurations will be modified by the presence of metrical structure erected on the tonal tier -- to create downdrift, downstep, etc. See Clements (1981) and Huang (1980).

2. For discussion of rules such as that in (12), and for motivation of the autosegmental nature of default tones, see Pulleyblank (1983b).

3. I am abstracting away from a regular process that converts a HLH sequence into H!HH. See Carter (1971) and Goldsmith (1981) for example, The actual surface form in this case would therefore be kàmùndí bóná.

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