with many CV matters. They enforce, for example, a distinction between *onset* consonant and *rime* (or *coda*) consonant that is never called on in the association patterns of consonantal morphemes; furthermore, they allow for, even suggest as the most natural case, the construction of inappropriate constituency-based templates. Imagine a form in which all consonants had to be in onsets—easy enough to spell out as ONON . . . (N = nucleus)—or a form in which none could be in onsets (RRR . . .); but of course such template conditions are quite unheard of. Recall also the use of the CV tier in Marantz (1982), which responds directly to Edith Moravcsik's fundamental insight that reduplication is by and large not based on syllabic constituency. A different line of conjecture would have sonority information accessible at the level of syllabic terminals; C,V,G then refer in a skeletal way to the elementary distinctions of sonority, which induce syllable structure. However, there is evidence that a notion of pure position, unconstrained by C/V content, can be called on, as Prince (1975) and Ingria (1980) have assumed. Consider the Hebrew definite article prefix *ha-*. It causes gemination of a following consonant: *ha-+da:ba:r = hadda:ba:r*. Yet when that consonant is a "guttural" and degeminates by general rule, the vowel of the article compensatorily lengthens, filling the now empty *consonant* slot: *ha-+ʕi:r = ha:ʕi:r*. We want to say that the articles is /haX/, where X is just a slot. In some dialects of Yupik (Reed et al. (1977)), syllables $C\breve{V}$ are strengthened when they are stressed and precede a stressed syllable. If the conditioning syllable is CVV—containing a long vowel or diphthong—then a simple gemination of its initial consonant takes place: CVCVV → CVC_iC_iVV. More interesting is the case where the conditioning syllable is closed: here lengthening of the vowels /a i u/ takes place, CVCVC → CVVCVC, but schwa induces gemination of C, CəCVC → CəCCVC. The apparently aberrant behavior of schwa has a straightforward explanation: schwa can never be long (geminated) or, more generally, part of a diphthong, either in the lexicon or as a result of phonological rule. Thus, we want to say that stressed CV acquires a postvocalic *position* before another stressed syllable: the position is filled in with neighboring material, vowel or consonant according to the strictures of the language. Compare also the treatment of Italian vowel-lengthening and raddoppiamento in Chierchia (1982).

2. The rule is subject to various other constraints that do not affect the outcome of the present argument and will therefore be left unexplained.

3. The phonotactic constraints discussed here and in the next section are derived from the work of Karttunen (1970). Of course, she should not be held responsible for the way I have chosen to formulate them.

4. The cluster *sp* does show up in recent loans, e.g., *aspirin*.

5. I take it that *ie* and *uo* (*üö*) may be omitted from consideration, since they derive from *ee* and *oo* (*öö*). However, even if they are not so derived, the descriptive complication they would induce does not bear on the essentials of this argument.

6. There is some morphological interference with the conditioning of the rule in the modern language, but not enough to render the basic phonology obscure or problematic. Lehtinen (1962) provides a useful survey of the details of gradation. The treatment given here abstracts away from morphological expansions and contractions of the fundamental phonological environment.

Chapter 12

Meeussen's Rule

John Goldsmith

I would like to review some properties of a widespread rule in Eastern Bantu languages, a rule that I have elsewhere called *Meeussen's Rule* (Goldsmith (1982b)). The general effect of this rule is to reduce a sequence of consecutive accents—or perhaps in some cases, of High tones—to a single accent (or High tone). Virtually all the systems in question display characteristics of "displaced tone systems," in which the tones induced by a given syllable or morpheme appear superficially one or more syllables to the left or right. In the case of Ruri and Rimi, for example, the syllable bearing a High tone on the surface is typically one syllable to the right of the syllable triggering the High tone. For reasons discussed below, and in more detail in Goldsmith (1982a, b) and Clements and Goldsmith (1982), I shall indicate the syllable that triggers a High tone—independent of where the High tone surfaces—with an asterisk, and call it an *accented* syllable or vowel.

Meeussen's Rule can then be formulated as shown in (1a). Its effects are schematized in (1b), and its homologue, *Anti-Meeussen's Rule* (or a Right-handed Meeussen's Rule), is given in (2).

(1)

a. $\overset{*}{\breve{V}}\ C\ \overset{*}{\breve{V}} \rightarrow \overset{*}{\breve{V}}\ C\ V$

b. $\overset{*}{\breve{V}}\ C\ \overset{*}{\breve{V}}\ C\ V\ C\ V\ C\ \overset{*}{\breve{V}}\ C\ \overset{*}{\breve{V}} \rightarrow \overset{*}{\breve{V}}\ C\ V\ C\ V\ C\ V\ C\ \overset{*}{\breve{V}}\ C\ V$

(2)

a. $\overset{*}{\breve{V}}\ C\ \overset{*}{\breve{V}} \rightarrow V\ C\ \overset{*}{\breve{V}}$

b. $\overset{*}{\breve{V}}\ C\ \overset{*}{\breve{V}}\ C\ \overset{*}{\breve{V}}\ C\ V\ C\ \overset{*}{\breve{V}}\ C\ \overset{*}{\breve{V}}\ C\ V \rightarrow$
$V\ C\ V\ C\ \overset{*}{\breve{V}}\ C\ V\ C\ V\ C\ \overset{*}{\breve{V}}\ C\ V$

Meeussen's Rule must be taken either to apply simultaneously or to be self-feeding (right to left for (1), Meeussen's Rule, and left to right for (2), Anti-Meeussen's Rule).

Let us first look briefly at three cases of Meeussen's Rule and one case of Anti-Meeussen's Rule.

1. Ruri

In Ruri, as described by Massamba (1982a, b), an accented syllable is realized by the following principles.

(3)

a. An accent on a phrase-final vowel is realized as a Rise-Fall pattern spread over the last two syllables.

b. An accent on the penultimate vowel of a word is realized as a High tone on that syllable.

c. Elsewhere (i.e., prepenultimately or on the final vowel of a word followed by another word), an accent is realized as a High tone on the following syllable.

As is typically the case in Bantu systems, verb stems are either underlyingly unaccented, or underlyingly accented on the first vowel of the stem. Thus, Ruri has the following classes of infinitives:

(4)

a. *Unaccented*

oku	gur	a	[òkù gùr à]
inf.	buy	Final Vowel	
oku	sakir	a	[òkù sàkìr à]
inf.	help	FV	
oku	sorotor	a	[òkù sòròtòr à]
inf.	pull out	FV	

b. *Accented*

oku	tém	a	[òkù tém à]
inf.	cut	FV	
oku	súmik	a	[òkù sùmík à]
inf.	tie	FV	
oku	súrumur	a	[òkù sùrúmùr à]
inf.	untie	FV	

Object prefixes, which immediately precede the verb stem, are all accented. The infinitives in (4a), therefore, pick up a High tone on the first verb-stem

vowel in (5), as expected. The accent stems in (4b), however, lose their own accent while they bear the High tone provided to them by the object prefix.

(5)

Infinitive with one object prefix

a. *Unaccented*

oku	gú	gur	a	[oku gu gúr a]
inf.	it (cl. 3)	buy	FV	

b. *Accented*

oku	gú	tém	a	[oku gu tém a]
inf.	it (cl. 3)	cut	FV	

The operative rule is Meeussen's Rule, which deletes a stem accent after an object accent, as in (6).

(6)

oku	gú	súrumurir	a	Underlying representation
inf.	it (cl. 3)	untie for	FV	
oku gú surumurir a				Meeussen's Rule
[oku gu súrumurir a]				Surface pattern

Massamba also notes that when two accented objects precede a verb stem, an opportunity for Meeussen's Rule to apply between two object prefixes leads to a surprising result. Instead of (7a), the correct form is (7b).

(7)

oku	mú	gú	gur	ir	a
inf.	IO 3sg.	DO	buy	applic.	FV

a. * oku mú gu gur ir a [oku mu gú gur ir a]

b. Correct: oku mú gu gur ir á [oku mu gú gur ír â]

Massamba proposes that when two pre–stem accents are found on adjacent vowels, the second is shifted to the Final Vowel (FV), as in (8).

(8)

$\acute{V}\ \acute{V} \rightarrow [_{stem}\ \acute{V}]$

As expected, (8) precedes Meeussen's Rule and bleeds its application. Other rules that Massamba explores in the subjunctive and present continuous have complementary effects. In particular, in these tenses, there exists a late accent shift rule that copies a Final Vowel accent onto the first vowel of the verb stem. If this should be a verb stem preceded by exactly

one object prefix (the FV accent having arisen by a rule other than (8)), a representation with two contiguous accents will result, as in the form [a gu sórótŏr ê]:

(9)

a gŭ sorotor e	Underlying representation
a gŭ sorotor ĕ	(Early rule)
does not apply	Meeussen's Rule
a gŭ sŏrotor ĕ	Accent Copy-back Rule
[a gu sórótŏr ê]	Surface pattern
'he pulled it out'	

2. Tonga

In Tonga, as in Digo (section 3), the tonal realization of accent in a two-accent word differs radically from its realization in a one-accent word. A verb with only a single accent is realized as all Low—exactly like a word with no accents, in fact. However, a verb with *two* accents is realized with High tones on all the syllables between the accents, though *with Low tones on the accented vowels themselves*. This is illustrated in (10); the derivation is shown in (11), where the central rule, (12), deletes an initial H tone from one of the two HL accentual melodies.

(10)

a. tu la ku sĭlik a [tù là kù sìlìk à]
we tense you treat FV

b. bă la ku sĭlik a [bà lá kú sìlìk à]
we tense you treat FV

(11)

(12)

$H \rightarrow \phi \; / \; [_{verb} \# \; \_\_$

In Tonga as well, Meeussen's Rule plays a crucial role. When consecutive accents arise in the verbal conjugation, all but the first delete, as in (13).

(13)

bă ⊛ă bă ⊛sĭlik a → bă a ba silik a → [ba a ba silik a]
they tense them treat FV

As discussed in Goldsmith (1982a), there is further evidence that the circled accents in (13) delete. A sandhi rule in Tonga operates in what Carter (1962) calls the "strong" constructions, where the verb and the object noun act like a single phonological word. In such constructions, the first syllable of the following object noun is always accented. Under such conditions, the syllables *a ba silik a* in (13) find themselves sandwiched between two accents, that of the initial subject marker *ba* and that of the object noun. Under the assumption that the circled accents have been deleted by Meeussen's Rule, we would expect these vowels to become High in tone, and that prediction is correct.

In Tonga a second rule interacts with Meeuseen's Rule in a way that sheds interesting light on Kiparsky's (1973) Elsewhere Condition. Recall that Kiparsky proposed that if the outputs of two adjacently ordered rules are mutually inconsistent, and if the set of forms to which one rule can apply properly includes the other, then the two are in a disjunctive relationship. That is, the more general rule will not apply to the strings that meet the description of the more specific rule and to which the more specific rule then applies.

In Kiparsky's examples, the same result would have been obtained if disjunctivity were defined in a slightly weaker fashion: the more general rule will not apply to any substring that meets the structural description of the more specific rule. Whether the more specific rule *actually* applies is irrelevant. In the case at hand, this minor difference has significant consequences.

The strong recent past in Tonga involves a rule that shifts an accent one vowel to the right following the accented tense marker *-ă-*. For example, in (14a) the unaccented stem *-lang-* receives an accent from the preceding object marker *-bă-*. In (14b) *-mu-* is unaccented, so no shift occurs.

(14)

a. ndi ă bă lang a → [nda bá lang a]
I tense them looked at FV

b. ndi ă mu lang a → [nda mu lang a]
I tense him looked at FV

This rule may be formulated as follows.

(15)
-*á-V-V (strong recent past only)

However, despite the fact that this rule is morphologically conditioned, and despite the fact that it is more specific in its application than Meeussen's Rule (which also applies to forms with accents in consecutive syllables), we can determine that it must be linearly ordered *after* Meeussen's Rule. In (16), where the two consecutive accents on the first two syllables are subject to Meeussen's Rule but *not* to (15), Meeussen's Rule applies to delete the second. This deletion of *-a-*'s accent bleeds the application of (15); in other words, Meeussen's Rule precedes (12). This is illustrated in (16).

(16)

bá á bá lang a	Underlying representation
bá a bá lang a	Meeussen's Rule
does not apply	(15)
bá a bá lang a	Surface pattern

The crucial point is that the Elsewhere Condition blocks the application of Meeussen's Rule to the sequence *á-bá* in (16) precisely because that sequence fits the description at the point in the derivation of the more specific rule in the disjunctive block (1) and (15).

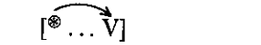
3. Digo

Kisseberth (1982) presents a wide range of data and analysis for Digo, an Eastern Bantu language. My analysis rests heavily on Kisseberth's material, though differing from it in certain central respects.

Kisseberth demonstrates a general principle in Digo verbs whereby if a single accent is underlyingly present, it will be shifted to the end of the word. A precise formulation of the principles determining whether this shifted accent surfaces as a Rise-Fall pattern, as in Ruri, or as a High tone on the penultimate syllable would require considerable discussion. The basic principles involved are given in (17).

(17)

a. *End-Run*



b. V [C] ®V
voiced
obstruent

End-Run (17a) shifts the first accent of any word to the Final Vowel position. If the preceding consonant is a voiced obstruent, the accent hops back one syllable and is realized as a High tone on the penult. Otherwise, it is realized as a Rise-Fall. (Kisseberth actually gives good reason to support the position that the shift in (17b) should be divided into a leftward copying rule followed by a postcyclic version of Meeussen's Rule, eliminating the Final Vowel's accent.)

Kisseberth illustrates the ways in which End-Run can apply either to an accent that is underlyingly on the verb stem (18a), or on a plural object marker (19), or on a third person subject marker (20).

(18)

a. ku *ărŭk â	'to begin'
ku *bŏmŏr â	'to demolish'
ku *fùrùkŭtâ	'to move about restlessly'
b. ku àmbìr à	'to tell'
ku chàngàmùk à	'to be cheerful'
ku dèzèk à	'to spoil (someone)'

(19)

ku vugurir a	'to untie for'
ku ni vugurir a	'to untie for me'
ku ku vugurir a	'to untie for you'
ku mu vugurir a	'to untie for him/her'
ku *ŭ vugurĭr â	'to untie for us'
ku *á vugurĭr â	'to untie for you(pl.) or them'

(20)

ku togor a	'to praise'
ni na togor a	'I am praising'
u na togor a	'you are praising'
*á na togŏr â	'he/she is praising'
tu na togor a	'we are praising'
mu na togor a	'you(pl.) are praising'
*má na togŏr â	'they are praising'

In each case, the accent moves from its underlying position, marked by the asterisk, to word-final position.

As in Tonga, when two nonadjacent accents are found underlyingly, a rather different surface tone pattern appears. In Digo, the first accent still migrates to the Final Vowel, but now a string of High tones runs from the

remaining, unshifted accent, all the way down to the Final Vowel with a Falling tone:

(21)

á na púput a	Underlying representation
a na púput á	End-Run
[a na púpút â]	Surface pattern
'he is beating'	

If, however, the two accents are underlyingly adjacent, the surface does not show a string of Highs running from the second down to the Final Vowel; in fact, what happens is that Meeussen's Rule applies first, leaving only one accent to undergo End-Run:

(22)

ku ú púput a	Underlying representation
ku ú puput a	Meeussen's Rule
ku u puput á	End-Run
[ku u pupŭt â]	Surface pattern
'to beat us'	

4. Rimi

Finally, I would like to review certain features of Rimi, a Tanzanian Bantu language studied by Olson (1964) and analyzed further by Schadeberg (1978, 1979). Like Ruri, Rimi is a tone displacement system, in which most High tones appear superficially one syllable to the right of their underlying (accentual) position. Furthermore, as Schadeberg demonstrates, there is a large class of nonmobile accents (realized as a High tone without shifting syllable) that is the modern reflex of Proto-Bantu High tone on a long vowel. Thus the shift of tone, or accent, to the right was organized by moras, not syllables, and thus High tone, occurring on the first mora of a long vowel, did not shift out of the syllable. In modern Rimi, where there is no basic vowel length contrast, the modern reflex of vowel length is the refusal of an accent to shift to the right, a shift that all other accents undergo. (This evolution is reminiscent of the situation in Baltic.)

Verbal suffixes are toneless, as (23a) shows, but become High after a normal (accent-shifting) verb stem (23b).

(23)

a. u tend a	'to do'
u tend e a	applied
u tend a a	habitual
u tend ek a	stative
b. u tung á	'to tie'
u tung í a	applied
u tung á a	habitual
u tung ík a	stative

Just as (19) showed for Digo, in Rimi singular object markers are unaccented, whereas plural object markers are accented (in the human classes), as are most other object markers. Thus, we find *uhanga* 'to get', but *u-ya-háng-a* 'to get them (cl.6)'. Here *yá*, underlyingly accented, places its High tone on the following syllable.

When two or more accents appear consecutively, the Anti-Meeussen's Rule (2) applies, deleting all but the *rightmost* of these accents, which in turn shifts one syllable to the right to be realized as a High tone. See (24) and (25), for example.

(24)

a.	a qa qí kúnuku a (s)he tense it open FV	Underlying representation
b.	a qa qi kúnuku a	Anti-Meeussen's Rule
c.	[a qa qi kunúku a] 'he opened it (cl.7)'	Surface pattern

(25)

a.	ń qu vá í túm i a I tense them reflex. serve applic. FV	Underlying representation
b.	ń qu va i túm i a	Anti-Meeussen's Rule
c.	[n gú va i tum í a] 'I will serve them'	Surface pattern

Since certain accents do not undergo rightward displacement because of their etymological source in long vowels, it can be determined that the Anti-Meeussen's Rule must apply before this shifting. That is, forms like /u-mi-súc-íye/, in which the accent on *súc* never undergoes rightward displacement, surface as [u mi suciyé]; hence, the accent on the *i* must have deleted the nonshifting accent on *suc*, before shifting in turn to the right.

In this case, then, as in the others, when ordering relationships can be determined, Meeussen's Rule appears to be ordered early in the synchronic grammars—a testimony, perhaps, to its early diachronic status, as the rule

that crucially led to the institution of the mobile accent systems in these Eastern Bantu languages.

5. Discussion

Where would a rule such as Meeussen's Rule come from? Two sorts of answers are possible: historical and theoretical. Let us consider these in turn.

From a historical point of view, we know that the original two-way tonal contrast in Proto-Bantu gave rise to four tonal patterns on bisyllabic nouns: HH, HL, LH, and LL. As Guthrie (1967) observes, a large portion of the Bantu systems in the east of Africa lost the contrast between HL and HH in nouns. Going past Guthrie's observations on contrasts per se, we can note that the direction of neutralization is one by which the HH is treated like the HL, and not vice versa. The resultant pattern is one in which, in one- and two-syllable nouns, only one High tone appears, and this system is easily amenable to an accentual reinterpretation. *HL (and earlier *HH) is reinterpreted as bearing stem-initial accent, *LH bears accent on the second syllable, and *LL forms bear no accent at all.

Thus, historical High tones became interpreted as accents, and if there was a rule in the grammar that shifted H to L after H (H → L/H ____), its reinterpreted form would be one in which an accent was deleted immediately following another accent—that is, the familiar form of Meeussen's Rule (1). It appears, then, that the central active rule in the verbal morphology of the various languages considered here is in fact the historical remains of the Big Bang that must have occurred, occasioning the shift from a tonal system to an accentual one.

But from a theoretical point of view, there remains more to be said. Why was the HH pattern unstable (in the sense that it was shifted into the HL category by synchronic rule)? Whatever the answer turns out to be, it is clearly related to the issue that has been discussed in the literature under the rubric of the "Obligatory Contour Principle" (OCP) in the framework of autosegmental phonology.

In Goldsmith (1976, 36), the earliest theoretical position on this question, due to Leben (1973), is discussed. Leben posited a constraint on underlying melodies:

(26)
Obligatory Contour Principle (Morphotonological Constraint)
At the melodic level of the grammar, any two adjacent tonemes must be

distinct. Thus, HHL is not a possible melodic pattern; it automatically simplifies to HL.

According to Leben's formulation, this automatic simplification could apply even before the initial association of tonal melodies. Thus, HH patterns would simplify to H, as would HHH, etc.

While this places strong constraints on possible underlying melodies, and removes many potential ambiguities concerning how a surface tone pattern is to be analyzed, it is surely too strong a position, as is argued in Goldsmith (1976) and elsewhere. In Goldsmith (1976, 163), a revised version of the Obligatory Contour Principle is suggested.

(27)
Obligatory Contour Principle (Phonetic Constraint)
At the phonetic level, any contiguous identical segments must be collapsed into each other.

This version has been argued to be correct by Odden (1982) as a condition holding at all levels of representation *after* the underlying form. Such an "everywhere" interpretation, too, appears to be too strong. However, the weakest position sketched to date is probably too weak: the one proposed by McCarthy (1981, 384), according to whom "a grammar is less highly valued to the extent that it contains representations in which there are adjacent identical elements on any autosegmental tier." As pointed out in Goldsmith (1976, chapter 4), this result follows from the Phonetic Constraint version of the OCP; but something stronger may be needed to account for the introduction of rules into the tonal system of Bantu that change HH either to a single H or to HL, at an early stage of the tonological derivation.

There is a logical connection between the Phonetic Constraint OCP and the presence of a rule in the grammar collapsing identical segments. In fact, the OCP in most cases motivates such a rule. If derivations in a given language produce surface patterns such as (28a), then a rule such as (29) will be needed to create (28b), given the Phonetic Constraint OCP.

(28)
a. V_1 V_2
H H

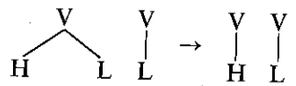
b. V_1 V_2
H

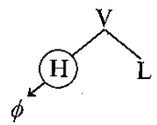
(29)
$T_1\ T_2 \rightarrow T_{1,2}$
under the condition that T_1 and T_2 are identical.

How early will this rule be ordered? Certainly there is evidence that it tends to be ordered early, evidence that might otherwise be taken in support of Odden's "everywhere" version of the OCP.

Consider, for example, the phenomenon that Hyman and Schuh (1974) refer to as Tone Absorption. A typical example can be seen in the rules that simplify Falling tones in Kikuyu (Clements (1982)):

(30)

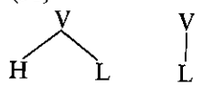
a. 

b. elsewhere 

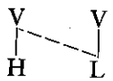
Here, Falling tones simplify to High before Low, and to Low elsewhere. Why is this sort of context-dependent simplification extremely common, as contrasted, say, to the rarer simplification of Falling to Low before Low?

One approach to this problem is to analyze (30a) as being composed of two steps, of which (29) is the first. (29) would apply to (31) to create (32); and (32) would in turn become (33) by deletion of a single association line.

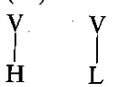
(31)



(32)



(33)



A natural hypothesis that I would like to suggest is that (32) represents a more complex phonological state than (33) precisely in not displaying a one-to-one association. While many-to-one and many-to-many associations are not uncommon, there is nonetheless something unusual about them. Let us make this precise by defining a notion of the *autosegmental tension (T)* of a representation.

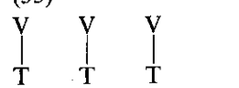
(34)

The *autosegmental tension* T_V of the vowel tier of a representation is the number of vowels with two association lines, plus twice the number of

vowels with three association lines, etc. Similarly, we define the *autosegmental tension* T_T as the number of "doubly associated" tones (tones with two association lines), plus twice the number of tones with three association lines, etc.

Informally speaking, the larger the tension index T, the more the representation departs from a one-to-one structure. Thus, by (34) the autosegmental tensions of the following representations are as noted:

(35)



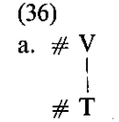
$(T_V, T_T) = (0, 0)$

$(T_V, T_T) = (0, 2)$

$(T_V, T_T) = (1, 1)$

Intuitively, we may think of the tension as representing the "energy state" of the system. (Pursuing that analogy, one might wish to define the contribution of an unassociated vowel, or tone, as being proportionately much greater; (34) leaves this question open, a point to which we will return briefly below.) This notion is clearly a useful one for autosegmental theory. It allows, for example, a satisfying account of the symmetrical one-to-one association principle described in language after language (see for instance Williams (1976), Leben (1973), Goldsmith (1976), Clements and Ford (1979), Haraguchi (1977)). As noted in Goldsmith (1974), tone languages differ from accent languages in that tone languages have initial association rules that are sensitive only to boundaries; typically, they associate the first vowel of a word with the first tone of the tonal melody, as in (36a). Accent systems (Goldsmith (1982a)) initially associate accented vowel with accented tone, as in (36b) (for a different view, see Clements and Ford (1979)).

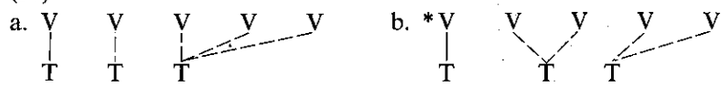
(36)

a. 

b. 

However, after this initial single-vowel to single-tone link, both systems associate as in (37a), not as in (37b).

(37)



We may now characterize this difference between (37a) and (37b) by noting that the dotted association lines added by the Well-formedness Condition in (37a), though not those in (37b), satisfy the Tension Condition (38).

(38)
Tension Condition
Minimize autosegmental tension in the neighborhood of a bound element (where the bound elements in (37) are those already created by (36)).

Summarizing, then, we take (36a, b) to be the principal initial tone association rules and the Tension Condition to be the primary principle governing the application of the Well-formedness Condition. It ensures that one-to-one association will be maximized in the vicinity of earlier bound elements.

In fact, if we accept the suggestion made above that unassociated elements contribute heavily to the autosegmental tension T, we may merge the Tension Condition with the Well-formedness Condition in (40).

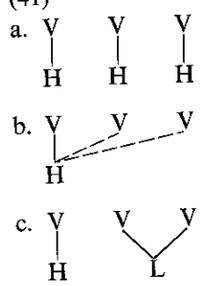
(39)
Well-formedness Condition

a. All vowels are associated with (at least) one toneme.
b. All tonemes are associated with (at least) one vowel.
c. Association lines do not cross.

(40)
Minimize autosegmental tension T.

The minimization of autosegmental tension and the Phonetic Constraint OCP are principles that may conflict, in the sense that a rule motivated by the OCP may increase the tension T. A rule such as the precursor of Meeussen's Rule applying to (41a) to derive (41b) is motivated by the OCP, while it increases T from (0,0) to (0,2). The rule applying to (41b) to derive (41c) is motivated by the Tension Condition, in that it in turn lowers T to (0,1). These appear to be considerations directly relevant, then, to the origin and development of Meeussen's Rule (1) in Eastern Bantu.

(41)



6. Summary

In this paper, I have reviewed some well-known facts and some that are less well known, and have suggested certain revisions of autosegmental theory along lines that link tonal phenomena in certain ways. I have illustrated the historical merger of *HH and *HL noun classes along with the preservation of *LH and *LL classes in a large Bantu subfamily; I have shown that this reanalysis results in a stage in which originally tonal information is specifically located along the linear string of vowels; this stage I refer to as an accent system. The historical process changing HH to HL is synchronically present in three of the four languages considered here in the revised form, according to which an accent deletes immediately following an accent (or, equivalently, as suggested in Goldsmith (1982b), an accent shifts leftward onto an immediately preceding accent).

The change from a tonal to an accentual system is accompanied by a rapid increase in the number of accent shift rules, for while tone rules are largely restricted to rules that add and delete association lines (and thus maintain the tone melody's stability), accent systems are highly mobile, with accents being shifted over potentially unbounded distances, as in Digo. The specific tonological rule that triggered the change (HH → HL), however, is motivated by the Obligatory Contour Principle and a proposed measure of the "autosegmental tension" of a representation.