Tiv and the Association Conventions

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TIV AND THE ASSOCIATION CONVENTIONS

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0. Introduction

Crucial to a theory of autosegmental phonology, no matter what its details, is that features are represented on a number of parallel tiers. Such tiers enjoy a considerable degree of autonomy --for example deletion of a segment on one tier does not entail the deletion of a related segment on another tier-- and yet there must clearly be principles for relating the elements of one tier to those of another if we are ultimately to derive an 'orchestrated' phonological representation. In this paper, I will discuss three basic proposals aimed at characterizing the relationship between tiers, and I will argue that none of these proposals succeeds fully in capturing certain generalizations observable in the Tiv verbal system. Consequently, a modified set of association principles will be proposed and some of their advantages for Tiv will be demonstrated.

1. Background

One of the earliest proposals for relating tiers was the Tone Mapping Rule of Williams (1971). Williams proposed essentially a left-to-right one-to-one mapping rule which linked tones to syllables. He assumed that if the mapping procedure ran out of tones before all syllables became linked to one, then the last tone would automatically be spread to any remaining syllables in

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the relevant domain. On the other hand, if the procedure ran out of syllables before all tones had been assigned, Williams assumed that multiple linkings of tones to a single syllable could only result from a language-specific rule. Williams' position is outlined below:

1.i. It maps from left to right a sequence of tones onto a sequence of syllables.
 ii. It assigns one tone per syllable, until it runs out of tones,
 iii. then, it assigns the last tone that was specified to the remaining untoned syllables on the right,...
 iv. until it encounters the next syllable to the right belonging to a morpheme with specified tone.
 v. If the procedure above runs out of syllables, more than one tone may be assigned to the last vowel only if the grammar of the language includes a stipulation to that effect. (CF: Halle and Vergnaud 1982)

A rather different approach than that outlined above was proposed in Goldsmith (1976) where it was suggested that all stages of a derivation were subject to the following well-formedness condition:

2.a. All vowels are associated with at least one tone.
 b. All tones are associated with at least one vowel.
 c. Association lines do not cross.

If a configuration violated the well-formedness condition (2), then association lines would be added or deleted until the representation was well-formed.

One crucial difference between the proposals of Williams and Goldsmith concerns contour tones: Goldsmith (1976) would automatically link more than one tone to a single tone-bearing unit, while Williams (1971) would not. Both approaches assumed automatic spreading of tones onto toneless vowels.

Looking basically at Kikuyu, Clements and Ford (1979) propose a somewhat different set of association conventions, and argue for a position similar in many respects to that of Williams (1971). They still assume automatic spreading of a single tone onto more than one vowel, but they return to Williams' position that contour tones are only created by language-specific rules.

Halle and Vergnaud (1982), in yet a further development, propose that the association conventions apply only to free ('floating') tones. Hence a configuration such as (3) will trigger the association conventions, while (4) will not.

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3.
$$
\begin{bmatrix} H \\ V\ V\ V \end{bmatrix} \longrightarrow \begin{bmatrix} H \\ V\ V\ V \end{bmatrix}
$$

4.
$$
\begin{bmatrix} H \\ | \\ V\ V\ V \end{bmatrix}
$$

The question therefore arises as to what will happen to the left-over vowels in a representation such as (4). In fact, the same question is relevant even for a theory with automatic spreading: What happens to vowels in a configuration such as (5) where there is no tone available for association?

5.
$$
\begin{bmatrix} \ \\ V\ V\ V \end{bmatrix}
$$

Halle and Vergnaud (1982) propose that in Tonga such cases surface with L-tones throughout. I will encode that proposal in the following way:[1] Following Kiparsky (1982), I will assume that lexical entries are underspecified and that the unspecified values for features are filled in by rules that may be either general or language-specific. It is proposed by Kiparsky that all features must be supplied minimally with a rule of the form [ ] $\longrightarrow$ [α F], where 'α' is either '+' or '-', and that the set of such rules comprises a part of a theory of universal markedness. I propose therefore that for the feature [$\pm$ High Tone], the unmarked value is [- High Tone], and that it is this value that will be supplied to any vowel that has not received a tone by the association conventions or by rule.

Given this much introduction to the problem of how to relate tiers, let us now turn to Tiv, a Benue-Congo language of Nigeria.

2. Downstep

There are a number of reasons for analysing downstep in Tiv as being triggered by a floating L-tone. From a theoretical standpoint, Clements and Ford (1979) correctly point out that a theory of tone that provides a single mechanism for describing downstep is more restrictive than a theory of tone allowing several alternatives for the analysis of downstep. Moreover, they argue that downstep in Kikuyu should be analysed as a floating tone. They propose therefore that all examples of downstep entities be analysed as floating tones. This proposal receives empirical support from Tiv.

As a general rule in Tiv, H-tones undergo 'register' lowering (automatic downdrift) when preceded by L-toned vowels. Consider for example the pitch-level of gá 'not' in the following examples:

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6.a. á vé gá   [¯¯¯]   'he did not come (recently)'

  b. á dzà gá   [¯_-]   'he did not go'

In (6a), gá is on the same pitch-level as á, but in (6b), gá is lower than á because of the intervening L-toned verb dzà. Looking at the interval between a H and a following !H, we observe that it is the same as between the two H-tones in a HLH sequence where the intervening L is linked. Compare for example (7a) and (7b) with the forms given in (6).

7.a. á vé   [¯¯]   'he came (recently)'

  b. á !vá   [¯-]   'he came'

Analysing downstep as a floating L-tone correctly predicts that the extent of register lowering will be the same whether the trigger is a downstep entity or a linked L-tone.

Another argument comes from Arnott (1964, 1968) where it is shown that downsteps in Tiv alternate with L-tones under certain circumstances. Consider the following examples:

8.a. ùnyìnyà mbâ
    horses copula   'there are horses'

  b. mbá! ván
    cop. coming   'they are coming'

9.a. kásév mbâ
    women copula   'there are women'

  b. kásév mbá! gá
    women cop. NEG   'there are not any women'

10.a. íwá ngî
    dogs copula   'there are dogs'

  b. íwá ngí! yévèsè
    dogs cop. fleeing   'the dogs are fleeing'

The copulas in (8-10) have a falling tone on a short vowel pre-pausally but occur as H! in non-pre-pausal position. Assuming that a falling tone is created by a HL sequence, this means that a pre-pausal L is alternating with a non-pre-pausal !. Moreover, this tonal behaviour is not restricted to any particular class of lexical items; Arnott gives examples with copulas, verbs (Habitual 2) and nouns. If the downstep entity is not analysed as being a floating L-tone, then there is no obvious explanation for alternations such as those seen above.[2]

In order to make two final arguments for representing

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downstep as a floating L̲ in Tiv, I will side-track to motivate a general rule of H-spread.

2.1. H-spread

Consider pairs of nouns such as those given in (11):

11.

stem	sing.	plural	
H̲			
a. daka	dákà	ùdákà	'type of gun'
L H			
b. dari	dàrí	ùdàrí	'half-penny'

We observe that in the singular such nouns do not have a noun-class prefix, while in the plural there is a L-tone u̲- prefix. These examples are included merely to illustrate the rather bland observation that the addition of a L-tone prefix to a noun has no effect on the tonal pattern of a stem.

In contrast, consider below what happens when it is a H-tone prefix that is added to a noun stem:[3]

12.

stem	sing.	plural	
L			
a. bagu	bàgù	íbá˙gú	'red monkey'
L			
b. kagh	ìkàgh	áká˙gh	'bundle'
L H			
c. kegh	ìkègh	íké˙gh	'chicken'
L H			
d. gbise	ìgbìsé	ágbí˙sé	'type of tuber'
LL H			
e. kaande	ìkààndé	ákààndé	'type of shellfish'
H			
f. mbor	ìmbór	ámbór	'spring of water'

L H We observe that the initial L̲ of a stem such as ba̱gu or gbi̱se is displaced by the H̲ of the class prefix. The L̲ that has been so displaced will trigger downstepping of the following syllable when it is H̲ (12a-d) and will have no effect when the following syllable is L̲ (12e). These alternations can be simply accounted for by positing a rule of H-spread as shown in (13).

13. H-spread: H L
                  ↘↓
                  V V
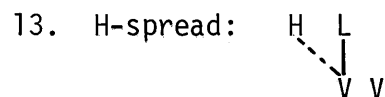
This rule spreads a H-tone onto a non-final L-tone. Although it has not been specified in the form of the rule, I assume that H-spread will automatically de-link the relevant L-tone as the result of a lexical constraint in Tiv that allows no more than one tone to be linked to a single tone-bearing unit.

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The simplified derivations given in (14) below illustrate H-spread as it applies to nouns such as íbá·gú 'red monkeys' and ákáàndé 'type of shellfish (pl)', where each noun consists of a stem, a class suffix and a class prefix.

14.a.

$$
\begin{bmatrix} H \\ | \\ i \end{bmatrix} \begin{bmatrix} L \\ | \\ bagu \end{bmatrix} H \end{bmatrix} \rightarrow \begin{bmatrix} H \\ i \end{bmatrix} \begin{bmatrix} L \\ bagu \end{bmatrix} H \end{bmatrix}
$$

b.

$$
\begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} LL \\ || \\ kaande \end{bmatrix} H \end{bmatrix} H \end{bmatrix} \rightarrow \begin{bmatrix} H \\ a \end{bmatrix} \begin{bmatrix} LL \\ kaande \end{bmatrix} H \end{bmatrix} H \end{bmatrix}
$$

It is important to note that H-spread is a rule that applies not only to nouns, but to verbs as well. One example illustrating this point is given in (15) below. This example consists of a L-tone verb stem, a -H suffix marking the Recent Past tense and a subject prefix marking third person plural.

15.

$$
\begin{bmatrix} H \\ | \\ ve \end{bmatrix} \begin{bmatrix} L \\ | \\ vende \end{bmatrix} H \end{bmatrix} \rightarrow \begin{bmatrix} H \\ ve \end{bmatrix} \begin{bmatrix} L \\ vende \end{bmatrix} H \end{bmatrix}
$$

$$
\longrightarrow \text{ vé vé·ndé } \quad \text{'they refused (recently)'}
$$

All of the alternations discussed in this section are explained by assuming that when a L is caused to float by the rule of H-spread, the delinked L automatically triggers downstepping of a following H. If the downstep entity is not viewed as a floating L, then these alternations are left unexplained.

2.2. The Cycle

Before returning to the question of the association conventions, it is necessary to discuss briefly the role of the cycle in the tonal phonology of Tiv. Moreover, this discussion will provide another argument for analysing downstep in Tiv as triggered by a floating tone.

Consider a tonal configuration such as the following:

16.

$$
\begin{bmatrix} L \begin{bmatrix} H \\ V \ V \ V \end{bmatrix} \end{bmatrix}
$$

Assuming that the association conventions assign tones to tone-bearing units one-to-one from left to right (and putting aside the question of what happens to anything left over), then a theory with non-cyclic tone association would predict the tonal pattern given in (17a) while a cyclic approach would give the pattern in (17b).

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17.a. [L [H \\ ]] b. [L [H ⁝]]
     [[V V V]]   [[V V V]]
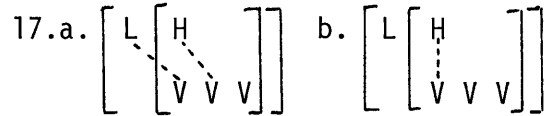
With this in mind, consider the following forms from the
General Past tense in Tiv:

18. General Past

H-stem			L-stem		
vé	·vá	!H	vé	dzà	L
they	came		they	went	
vé	·úngwà	!HL	vé	vèndè	LL
they	heard		they	refused	
vé	·yévèsè	!HLL	vé	ngòhòrò [4]	LLL
they	fled		they	accepted	

From the above discussion in sections 2 and 2.1., we know
that downstep in Tiv is triggered by a floating L-tone. Given the
lexical representation of verbs shown in (19), I conclude that the
General Past tense is marked by a L-tone prefix that creates the
type of tonal configuration seen in (17b).

19.a. H-stem verbs   b. L-stem verbs

[H   ]   [L   ]
[V (V) (V)]   [V (V) (V)]
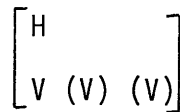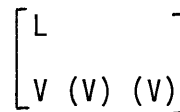
Cyclic tone association correctly accounts for the downstep
observed with H-stem verbs, while non-cyclic association would
incorrectly predict a LH pattern on the first two syllables of
words such as !úngwà and !yévèsè. Continuing to side-step the
problem of how left-over syllables get a tone, a word such as
!yévèsè would be derived as follows:

20.   [H   ]   Cycle 1: Stem; Association
      [⁝   ]   Conventions
      [yévese]

      [L [H   ]] Cycle 2: General Past Prefix
      [[⁝   ]]
      [[yévese]]
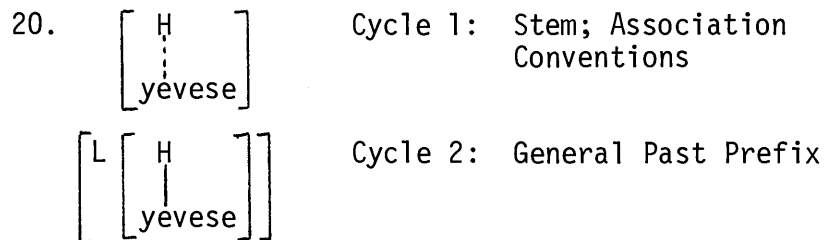
As a final point, note that this analysis automatically
accounts for why the H of the subject prefix does not spread onto
the initial L of the L-stem verbs in the General Past --unlike
with comparable cases in the Recent Past. (See (15) above.) The
configuration created by prefixing the General Past morpheme and

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a subject prefix onto a L-stem verb is illustrated in (21)

$$21. \begin{bmatrix} \overset{H}{\underset{ve}{|}} \begin{bmatrix} \overset{L}{L} \begin{bmatrix} \overset{L}{\underset{vénde}{|}} \end{bmatrix} \end{bmatrix} \end{bmatrix} \longrightarrow \quad v\acute{e} \; v\grave{e}nd\grave{e} \quad \text{'they refused'}$$

In cases such as these, the structural description of
H-spread is not met since the rule only spreads a H̲ onto an
immediately following linked L̲. We see therefore that by analysing
the downstep entity observed with H-stem verbs in the General Past
as being a floating L-tone, we provide an immediate explanation
for the failure of H-spread to apply with the L-stem verbs in the
General Past.

To conclude this section, we see that by analysing downstep
in Tiv as being triggered by a floating L-tone, we account for
downsteps being created by spreading rules (12, 14, 15), for
'downsteps' preventing spreading rules (21) and for downsteps
alternating with contour tones (8-10). And from the conclusion
that downsteps are floating L-tones, it follows that tone assoc-
iation in Tiv must be cyclic.[5]

3. Automatic spreading

3.0. The cycle [6]

In section 2.2 we saw that tone association must be cyclic
in order to give a satisfactory account of downstepping facts in
Tiv. But if tone association is cyclic, then consider the deriva-
tion of a Recent Past verb form such as seen in (15). In (22a) I
give the form that would result if spreading of a linked tone onto
toneless vowels were considered to be automatic (see section 1);
in (22b) I give the form that would result without automatic
spreading.

22.a. $\begin{bmatrix} \overset{L}{\underset{v\acute{e}nd\grave{e}}{\wedge\searrow}} \end{bmatrix}$ b. $\begin{bmatrix} \overset{L}{\underset{vende}{\vdots}} \end{bmatrix}$ Cycle 1: Stem

$\begin{bmatrix} \begin{bmatrix} \overset{L}{\underset{v\acute{e}nd\grave{e}}{\searrow}} \end{bmatrix}^H \end{bmatrix}$ $\begin{bmatrix} \begin{bmatrix} \overset{L}{\underset{vend\acute{e}}{|}} \end{bmatrix}^H \end{bmatrix}$ Cycle 2: Recent
                                                 Past Suffix

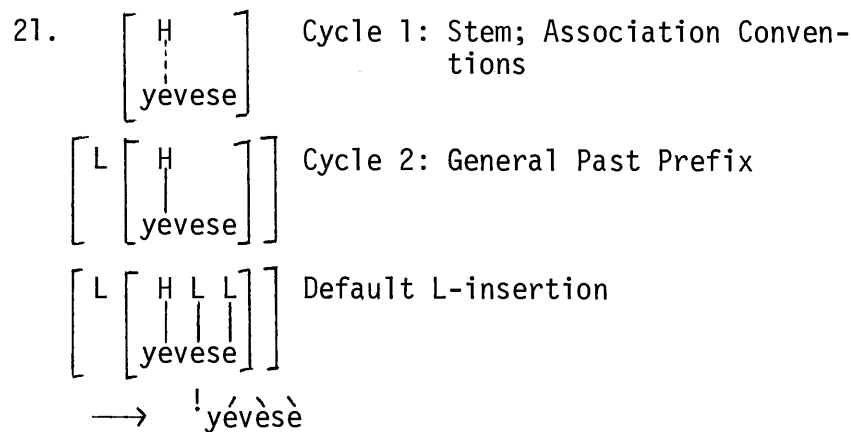$\longrightarrow$ *vèndè $\longrightarrow$ vèndé

or *vènděé

We see that the inclusion of the cycle in the tonal
phonology of Tiv requires that we abandon the convention of
spreading tones automatically, as discussed in section 1. Automat-
ic spreading would require that a case such as (15) be derived
non-cyclically; and a non-cyclic approach would make it impossible

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to maintain the unified account of downstep presented above, without adding ad hoc stipulations to account for a tense such as the General Past.

3.1. Past tense forms

We saw in section 2.2 that the General Past is marked by a L- prefix. This prefix triggers downstep with the H-stem verbs and prevents H-spread from applying between subject prefixes and L-stem verbs. Concerning the tones that surface on the verb stem itself, we see in (18) that the lexical tone (CF: 19) appears on the first vowel of the stem, exactly as it should given left-to-right association. Any additional stem vowels surface as L. In the preceding section, it was argued that spreading cannot be automatic in Tiv. This would mean that if the sole marker of the General Past is a L- prefix, then no tone will be assigned except by default to the second and/or third vowel of a disyllabic or tri-syllabic verb.

21.
$$\begin{bmatrix} H \\ \vdots \\ yevese \end{bmatrix}$$ Cycle 1: Stem; Association Conventions

$$\begin{bmatrix} L \begin{bmatrix} H \\ | \\ yevese \end{bmatrix} \end{bmatrix}$$ Cycle 2: General Past Prefix

$$\begin{bmatrix} L \begin{bmatrix} H\ L\ L \\ |\ \ |\ \ | \\ yevese \end{bmatrix} \end{bmatrix}$$ Default L-insertion

$$\longrightarrow\ \underline{^!yévèsè}$$

Hence a theory that assigns L as a default value, and that does not have automatic spreading, can account for the General Past in a maximally simple way, that is, as marked by a L- prefix.

Consider now the forms of the Recent Past:

22. Recent Past

H-stem			L-stem		
´! ´ m vé		H	´! ´ m dzé		H
I came (rec.)			I went (rec.)		
´! ´ ´ m óngó		HH	´ ` ´ m vèndé		LH
I heard (rec.)			I refused (rec.)		
´! ´ ´ ` m yévésè		HHL	´ ` ´ ` m ngòhórò [7]		LHL
I fled (rec.)			I accepted (rec.)		

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Segmentally, the Recent Past tense involves a process of ablaut. However, as the ablaut rule does not affect tonal representations, it will not be discussed here. [8] Concerning its tonal forms, it was suggested in (15) that this tense is marked by a -H suffix. Assuming that spreading is not automatic, this -H will link to the second vowel of the stem, when there is one, producing configurations such as the following:

23.a.
$$\begin{bmatrix} \text{H} \\ \vdots \\ \text{yévese} \end{bmatrix}$$
b.
$$\begin{bmatrix} \text{L} \\ \vdots \\ \text{ngòhoro} \end{bmatrix}$$
Cycle 1: Stem;
Assoc. Conv.

$$\begin{bmatrix} \begin{bmatrix} \text{H} \\ | \\ \text{yevése} \end{bmatrix} \text{H} \end{bmatrix}$$
$$\begin{bmatrix} \begin{bmatrix} \text{L} \\ | \\ \text{ngohóro} \end{bmatrix} \text{H} \end{bmatrix}$$
Cycle 2: Rec. Past;
Assoc. Conv.
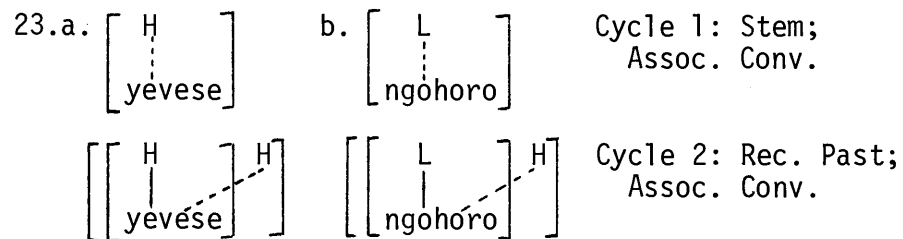
The left-over vowel in such cases will be assigned L by default, correctly resulting in the surface forms yévésè and ngòhôr after late rules of vowel deletion and tone attachment.

There is one residual problem concerning the derivation of a form such as ḿ! dzé 'I went (recently)' or vé dzé 'they went (recently)'. The expected derivation of such forms would result in a configuration such as in (24).

24.
$$\begin{bmatrix} \begin{bmatrix} \text{L} \\ | \\ \text{dzé} \end{bmatrix} \text{H} \end{bmatrix}$$
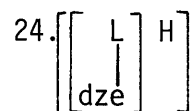
Clearly, some rule is required to change the lexical L of the verb stem into a H in such cases. Note, moreover, that the stem L cannot simply be delinked by the -H suffix since that would incorrectly predict a downstep in forms such as vé dzé. I propose a rule that raises a L to H when it is followed by a floating H.

25. Raising: L ⟶ H / ___ (H)

This rule applies in a number of tenses, such as the Imperative, the Habitual and the Subjunctive and helps to account for the surface distribution of contour tones in Tiv. (See Pulleyblank 1982)

In summary, we see that a theory of tone that does not include automatic spreading can account for the Recent Past forms in Tiv by simply positing a -H suffix. Hence both the General Past and the Recent Past are given unified representations in such a theory.

In contrast to the straightforward account for these tenses given above, a theory postulating automatic spreading requires a number of complications. First, such a theory cannot assume cyclic

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association and consequently must find an alternative account for
the initial downstep in tenses such as the General Past. Secondly,
it cannot be maintained in the General Past, for example, that
there is no tone following the lexical tone since were such to be
the case, the lexical H-tone of the H-stem class would automatical-
ly (and incorrectly) spread to all vowels of the stem. Hence one
must posit a L-tone following the lexical tone in this tense. But
this in itself is problematic since such a putative L-tone does not
appear when the verb stem is monosyllabic, as in vé !vá 'they came'.
Leben (1973) and Goldsmith (1976) suggest that this problem can be
solved by a rule that Leben calls Tone Simplification (Tiv) and
that I reproduce in (26).

> 26. Delete any L that occurs in sequence with H on a
>   [+syllabic] segment.

We have already seen in (8-10) above, however, that there
are HL sequences on short vowels in Tiv and (26) cannot therefore
be a general rule. Hence Leben's Tone Simplification (Tiv) (and
Goldsmith's 'Fall-Simplification) cannot be maintained except
perhaps as a minor rule restricted to a tense such as the General
Past. Hence in a theory that postulates automatic spreading, one
is forced to assume an ad hoc rule for the General Past or to
assume different forms for the General Past morpheme depending on
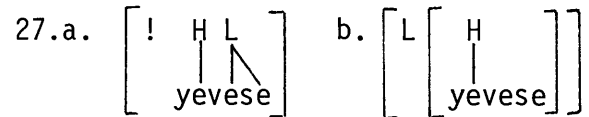the number of syllables in a verbal stem.

Looking at the Recent Past, the automatic spreading solution
encounters a similar problem since the final L of the trisyllabic
forms requires that a L be present in the representation of the
tense for such forms in order to prevent spreading of the -H
suffix. And yet this putative L does not surface with monosyllabic
and disyllabic stems. We are again forced to assume that there is
more than one Recent Past morpheme, and that the correct choice of
tense melodies depends on the number of syllables in a verb stem.

In conclusion, we see that a theory that assumes automatic
spreading and lexical representations for verbs as in (19), is
forced to posit non-uniform underlying representations for tense
morphemes such as the General Past and Recent Past. In addition to
a L- prefix, the automatic spreading approach is forced to posit a
-L suffix for disyllabic and trisyllabic verb stems in the General
Past. And for the Recent Past, the automatic spreading approach
must assume a -H suffix for monosyllabic and disyllabic stems, but
a -HL suffix for trisyllabic stems. In fact, it is accidental in
such an approach that the various melodies constituting a partic-
ular tense are as similar as they are, and that the 'extra' tones
are required only for 'extra' syllables, after the assignment of
the basic tense melody.

I argue therefore that inclusion of automatic spreading in
tonal theory results in a considerable loss of generalization
with tenses such as the General Past and the Recent Past.

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3.2. H-spread

Let us return to the General Past form of a H-stem trisyllab-
ic verb such as yevese. As was argued in section 3.1, a theory
with automatic spreading would have to assign a representation to
!yévèsè as in (27a) while a theory without automatic spreading
could assign a representation as in (27b). I ignore the question
of how a theory with automatic spreading will represent the initial
downstep in such a case.

27.a. $\begin{bmatrix} ! & H & L \\ & | & \backslash \\ & \text{yevese} \end{bmatrix}$ b. $\begin{bmatrix} L & \begin{bmatrix} H \\ | \\ \text{yevese} \end{bmatrix} \end{bmatrix}$

Although (27a) meets the structural description of H-spread,
(27b) does not. Hence a theory with automatic spreading incorrect-
ly predicts that the rule of H-spread should apply to such cases
giving an incorrect surface form such as *!yévésè. A theory with-
out automatic spreading can correctly block H-spread in such
cases by simply ordering the assignment of default values after
H-spread.

3.3. Habitual 3

As a final argument against automatic spreading, I wish to
consider a case which, on the face of it, seems to argue for auto-
matic spreading. I will argue, however, that the spreading invol-
ved is in fact yet another case of H-spread, and that attributing
it to universal convention entails a loss of generalization.
Consider the forms below:

28. Habitual 3

H-stem		L-stem	
!váán come	!HHH	!dzáán go	!HHH
!úngwán hear	!HHH	vèndán refuse	LHH
!yévésén flee	!HHHH	ngòhórón accept	LHHH

It would seem, at least superficially, that this tense in-
volves a H-tone suffix that has spread to all tone-bearing units
of the verb. But consider the following forms, which correspond
to the Habitual 1 tense:

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29. Habitual 1

H-stem		L-stem	
ⁱváa	!H	ⁱdzá	!H
come		go	
ⁱúngwá	!HH	vèndá	LH
hear		refuse	
yévésè [9]	HHL	ngòhórò [10]	LHL
flee		accept	

Apart from the initial downstep, tonal forms in the Habitual 1 are identical to forms in the Recent Past. I assume therefore that there is a H-tone suffix in the Habitual 1 tense just as there is in the Recent Past. It turns out to be the case, moreover, that this habitual -H occurs in all forms of the habitual. (See Pulleyblank 1982)
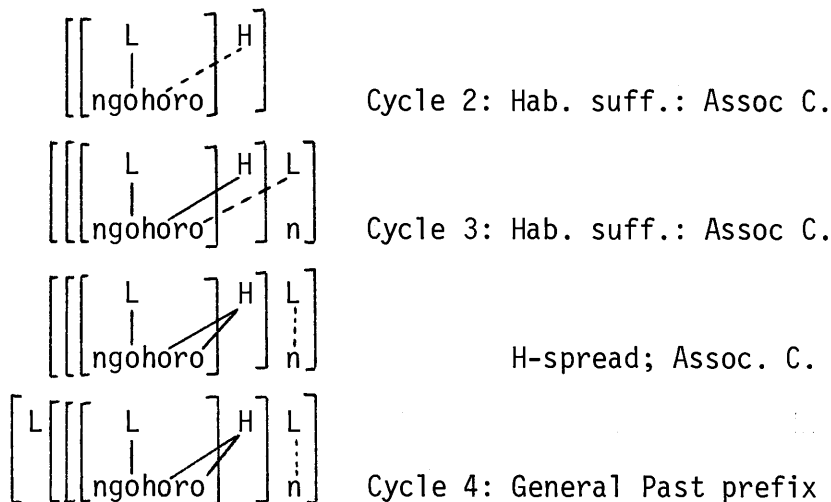
There are two important differences between the Habitual 1 and the Habitual 3. In the Habitual 1, we observe a H-tone suffix and no spreading; in the Habitual 3, we observe a H-tone suffix, a segmental -n suffix, and we get spreading. Hence the presence of the -n suffix correlates with spreading. Why this should be the case becomes clear when we examine yet another habitual tense form, such as the Past Habitual:
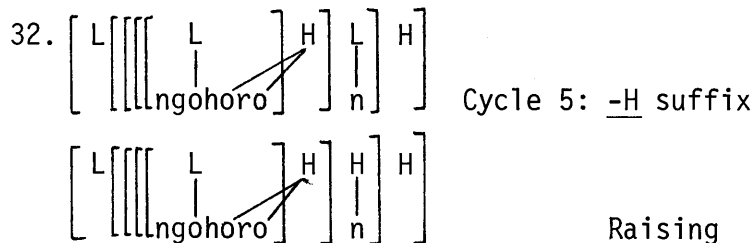
30. Past Habitual

H-stem		L-stem	
ⁱváán	!HHL	ⁱdzáán	!HHL
used to come		used to go	
ⁱúngwán	!HHL	vèndán	LHL
used to hear		used to refuse	
ⁱyévésén	!HHHL	ngòhóròn	LHHL
used to flee		used to accept	

The Past Habitual is marked by the L-tone prefix of the General Past and two habitual suffixes: the -H suffix observed in the Habitual 1 and a segmental -n suffix that bears a L-tone. The surface form of a L-stem such as ngohoro in the Past Habitual is therefore derived with no trouble:

31.
$$
\begin{bmatrix} L \\ \vdots \\ ngohoro \end{bmatrix}
$$
    Cycle 1: Stem; Assoc. Conv.

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$$\left[\left[\begin{matrix} L \\ | \\ \text{ngohoro} \end{matrix}\right]^{\dashrightarrow H}\right] \qquad \text{Cycle 2: Hab. suff.: Assoc C.}$$

$$\left[\left[\left[\begin{matrix} L \\ | \\ \text{ngohoro} \end{matrix}\right]^{H}\right]^{L}\right] \qquad \text{Cycle 3: Hab. suff.: Assoc C.}$$

$$\left[\left[\left[\begin{matrix} L \\ | \\ \text{ngohoro} \end{matrix}\right]^{H}\right]^{L}_{n}\right] \qquad \text{H-spread; Assoc. C.}$$

$$\left[^{L}\left[\left[\left[\begin{matrix} L \\ | \\ \text{ngohoro} \end{matrix}\right]^{H}\right]^{L}_{n}\right]\right] \qquad \text{Cycle 4: General Past prefix}$$

In the above derivation of ngòhóróǹ, it is crucial that on the third cycle, H-spread has been triggered by the structural configuration created by addition of the L-toned -n suffix. Now consider what would happen to the output of (31) if we were to attach an additional -H suffix:

32.
$$\left[^{L}\left[\left[\left[\begin{matrix} L \\ | \\ \text{ngohoro} \end{matrix}\right]^{H}\right]^{L}_{n}\right]^{H}\right] \qquad \text{Cycle 5: -H suffix}$$

$$\left[^{L}\left[\left[\left[\begin{matrix} L \\ | \\ \text{ngohoro} \end{matrix}\right]^{H}\right]^{H}_{n}\right]^{H}\right] \qquad \text{Raising}$$

Since such a -H would not be able to link, it would trigger the rule of Raising (25), giving the surface form ngòhóróń --which is precisely the form of the stem ngohoro in the Habitual 3! I propose therefore that the spreading that takes place in the Habitual 3 tense is triggered in exactly the same way as for the Past Habitual, that is, H-spread is triggered by the L-toned -n suffix. The distinguishing characteristic of the Habitual 3 is an additional -H suffix that triggers raising of the final L.

We see therefore that the reason that spreading takes place in a habitual tense, and not some other tense, is that the marker of the 'habitual' is a suffix that triggers H-spread. Hence even with a case which appears on the surface to be produced by context-free spreading, there is in fact a loss of generalization unless we attribute the spreading to the Tiv-particular rule of H-spread.

4. The Association Conventions (revised)

In the preceding section, four arguments have been presented to show that tone spreading cannot be automatic in Tiv. First, it was shown that automatic spreading is impossible if tone association is cyclic. Second, it was shown that automatic spreading

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results in a loss of generalization in the formulation of tenses such as the General Past and the Recent Past. Third, because of the melody required for a tense such as the General Past in a theory <u>with</u> automatic spreading, such a tense would have to be marked as an exception to an otherwise general rule of H-spread. Fourth, it was shown that an apparent case of context-free spreading in the Habitual 3 tense is actually a case of H-spread.

Since spreading is not automatic in Tiv, it cannot be a universal property of human language.

Hence clause (1.iii) of Williams' Tone Mapping Rule and clause (2.a) of Goldsmith's Well-formedness Condition must be rejected as language universals. I propose therefore that the universal aspects of the Well-formedness Condition and the Tone Mapping Rule are as follows:

> 33. Association Conventions:
>   Map a sequence of tones onto a sequence of tone-bearing units,
>   a. from left to right
>   b. in a one-to-one relation

> 34. Well-formedness condition:
>   Association lines cannot cross.

One immediate consequence of (33) is that it derives Halle and Vergnaud's (1982) proposal that 'the Tone Mapping Rules apply only to floating (=unlinked) tones'. Since tones are linked to tone-bearing units by the association conventions only in a strict one-to-one relation, a linked tone can never be subject to further linking <u>by convention</u>.

5. An alternative

Before concluding this paper, I will discuss briefly an alternative analysis suggested by John Goldsmith which would preserve automatic spreading as a language universal. His suggestion depends crucially on an interpretation of the Elsewhere Condition (See eg. Kiparsky 1973, 1982) such that, '...the more GENERAL rule can be precluded from applying not only by the ACTUAL application of the more specific rule, but the PRESENCE of the more specific rule -- that is, its potential application later in the derivation.' (Goldsmith 1981 p.24)
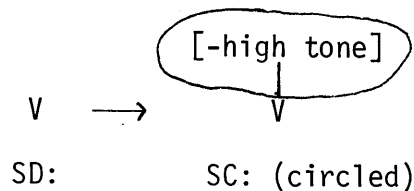
Given this version of the Elsewhere Condition, one might propose the following: Assume that automatic spreading is a part of universal grammar and therefore constitutes the 'GENERAL' rule for purposes of the Elsewhere Condition. Assume further that as a part of its grammar, Tiv includes a language-specific rule of L-insertion. If we consider L-insertion to be the more specific rule, then the application of automatic spreading will be

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precluded by the existence of L-insertion. Note that examples such as in section 3.2. show that automatic spreading is blocked at the early stages of a derivation, not because L-insertion has applied, but because it will apply (after H-spread).

The above position is problematic for a number of reasons. First, it depends on a rather powerful interpretation of the Elsewhere Condition that is not clearly required independently. For example, the evidence from Tonga that Goldsmith proposes as motivation for the revised Elsewhere Condition receives an alternative analysis in Halle and Vergnaud (1982) that does not require such a principle. In any event, even if the revised form of the Elsewhere Condition did turn out to be correct, it could not account for the lack of spreading in Tiv.

According to both the revised and unrevised versions of the Elsewhere Condition, it is the 'specific' rule that blocks application of the 'general' rule, and crucially, one must distinguish between the 'general' rule and the 'specific' rule on formal grounds --not by a priori assignment of one of the rules to universal grammar. Hence the special rule is defined as that whose structural description properly includes the structural description of the general rule. But when we consider the structural descriptions of the two rules of Default L-insertion and Spreading, we see that it is the structural description of Spreading that properly includes that of Default L-insertion; hence on formal grounds, it is L-insertion and not Spreading that is the general rule:

35. Default L-insertion

SD: SC: (circled)

36. Spreading (mirror image)

SD: SC: (circled)
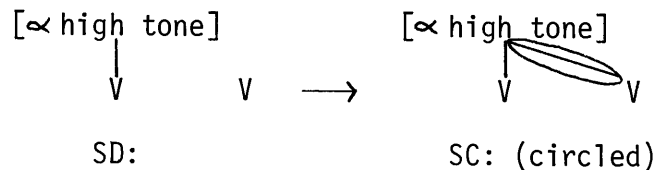
Were spreading to be universal --and subject to the Elsewhere Condition-- then it would preclude application of L-insertion. Consequently, even for a theory including Goldsmith's version of the Elsewhere Condition, spreading cannot be universal.

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Footnotes

[1]The proposal made here is somewhat different than that of Halle and Vergnaud since it treats the default tone as an autosegment rather than as a core specification. For a discussion of the implications of this difference, see Pulleyblank (1982).

[2]For discussion and formulation of the rule creating contour tones in examples such as (8-10), see Pulleyblank (1982)

[3]Hoffman (1976) showed that there is a H suffix present in those classes which take a H-toned prefix. This H-tone suffix is purely tonal in some noun classes while in other classes it is both segmental and tonal. See Abraham (1940).

[4]This form undergoes a late rule of vowel deletion to become ngòhòr. See discussion in Pulleyblank (1982)

[5]For detailed motivation of, and argumentation for, a cyclic approach to a tonal analysis of Tiv, see Pulleyblank (1982)

[6]Thanks to K.P. Mohanan for pointing out this argument to me.

[7]After vowel deletion, this form will become ngòhôr.

[8]For a discussion of ablaut in Tiv, see Archangeli and Pulleyblank (in preparation).

[9]For an explanation of the loss of the initial downstep in this form, see Pulleyblank (1982)

[10]After vowel deletion, this form will become ngòhôr.

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