

Floating Low Tone Deletion in Tiv and Morpheme Plane Hypothesis*

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1. Introduction

In this paper we will examine whether a multiplanar representation should be assumed when morphemes are concatenated in Tiv, an African language. McCarthy (1979, 1986, etc.) assumes that when morphemes are combined both in a non-concatenative language and a concatenative language, all skeletons are linearly ordered whereas melodies of separate morphemes appear on different planes¹. McCarthy (1979, 1986, etc.) argues that this is due to the Morpheme Plane Hypothesis² given in (1).

(1) The Morpheme Plane Hypothesis
If separate morphemes, separate planes.

That is, when two morphemes are added, concatenation occurs at some intersecting tier, for example, via the skeleton (in theories such as the CV-theory of Clements and Keyser (1983) or the X-theory of Levin (1985)) or via root nodes (in prosodic theories such as Hyman (1986), McCarthy and Prince (1986, etc.)). One example from English is given in (2).

(2) dog: 'a kind of animal', s: 'plural' morpheme

d o g	d o g
x x x + x	o o o + o (root node)
s	s

Specifically in this paper we will discuss the floating low tone deletion rule in Tiv. We will examine the analysis given in Pulleyblank (1986b), in which Pulleyblank makes crucial use of multiplanar representations based on the Morpheme Plane Hypothesis (1). This paper consists of the following sections. In the second section, we will present the analysis given in Pulleyblank (1986b) and show that floating low tone deletion cannot be explained with the multiplanar representation contra Pulleyblank (1986b). In the third section, we will suggest a floating low tone deletion rule in Tiv with a uniplanar representation and argue that there is little evidence supporting an intermediate stage of multiplanar representations in Tiv. In the final section, we will discuss the implication of this reanalysis.

* This article is a revised version of portions of Chapter 5 in Kang (1990). I am grateful to Juliette Blevins and Armin Mester for their comments.

¹ At least, this interpretation is consistent with his examples and the proposal that effects of Bracket Erasure be subsumed under Plane Conflation.

² Originally the term 'Tier' is used for 'Plane'. However, we accept the distinction between plane and tier given in Archangeli (1984) and follow the terms given in Archangeli (1984).

2. Floating low tone deletion in Pulleyblank (1986a,b)

In this section, we will discuss the floating low tone deletion rule in Tiv given as (3) in Pulleyblank (1986a,b)

(3) Floating low tone deletion (Pulleyblank 1986b: p9):

$$\textcircled{L} \text{-----} \emptyset / \text{---} \begin{array}{c} \text{V} \\ | \\ \text{H} \end{array} \left(\begin{array}{c} \text{V} \\ | \\ \text{H} \end{array} \right) \textcircled{\text{V}}$$

For example, consider the stems /va, H/ and /ungwa, H/ when they are concatenated with the future tense /a, LHL³. Pulleyblank (1986a) gives the following derivations, making use of underspecification theory and cyclity:

- (4) First cycle: a. $\begin{array}{c} \text{va} \\ | \\ \text{H} \end{array}$ b. $\begin{array}{c} \text{ungwa} \\ | \\ \text{H} \end{array}$
- Second cycle: $\begin{array}{cc} \text{a} & \text{va} \\ | & | \\ \text{LHL} & \text{H} \end{array}$ $\begin{array}{cc} \text{a} & \text{ungwa} \\ | & | \\ \text{LHL} & \text{H} \end{array}$

At this point, rule (3) applies to (4b), deleting the second floating low tone of the future prefix /a, LHL/: the second floating low tone is followed by a vowel with a high tone and a toneless vowel.

- (4--continued)-----
- rule (3) N.A. $\begin{array}{c} \text{a} & \text{ungwa} \\ | & | \\ \text{LH} & \text{H} \end{array}$
- (post-lexical) $\begin{array}{cc} \text{a} & \text{va} \\ | & | \\ \text{LHL} & \text{H} \end{array}$ $\begin{array}{ccc} \text{a} & \text{ungwa} \\ | & | & | \\ \text{LH} & \text{H} & \text{L} \end{array}$
- default tone SR: [!H!H]⁴ [!HHL]

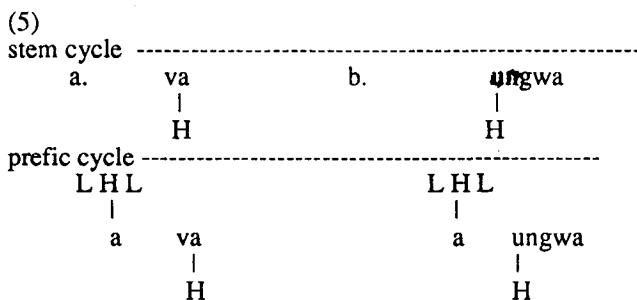
However, as Pulleyblank (1986b) notes, rule (3) has an unfortunate characteristic in that it has to refer to a vowel unspecified for a tone in the rule description of tone. In underspecification theory, an unspecified segment cannot be referred to in rule description unless it is the target of a rule which inserts the unspecified feature.⁵

Pulleyblank (1986b) suggests that rule (3) can be dispensed with if the Morphemic Plane Hypothesis (MPH) is adopted, along with the Universal Association Convention (UAC) for floating tones. With these conventions, the stems in (4) would undergo the following derivations (Pulleyblank 1986b: p10)):

³ The tone which is associated with the vocalic melody will be underlined.

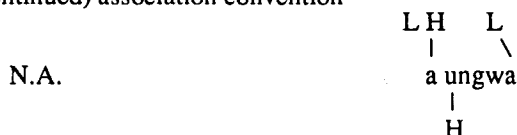
⁴ ! represents a floating low tone which downsteps the following high tone.

⁵ This restriction prevents an unspecified segment from playing a role as a third feature.



At this point in the derivation, the second L-tone of the prefix is free and so is the final vowel of the stem /ungwa/ in (5b). Therefore, Pulleyblank (1986b) suggests that nothing prevents the application of the UAC in linking a floating low tone to an available target V in [a[ungwa]].

(5---continued) association convention-----



(post-lexical) default tone insertion -----

N.A.	N.A.
------	------

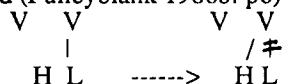
Surface Form-----



Under this analysis, the floating L-tone in the environment of a free tone-bearing unit is not actually deleted, but is linked to the free tone-bearing unit.

A floating L-tone can arise through the application of H-spread (6).

(6) H-spread (Pulleyblank 1986b: p6):



For instance, at the end of the Stem and Recent Past cycle, the representations of stems /vende/ and /ngohoro/ would be (7a): The recent past suffix is a floating H-tone which is associated with the second vowel of stems.

(7) a. Stem and Recent Past Suffix

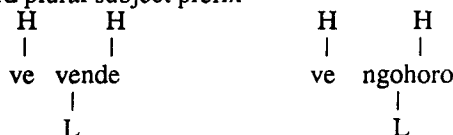


When the 3rd plural subject prefix /ve, H/ is concatenated to (7a) (cf. (7b)), H-spread (6) applies (cf. (7c)), delinking the L-tone from the stem, thereby

making it possible for a delinked L-tone to be relinked to the final toneless vowel in the trisyllabic stem (cf. (7d)). This association results in the right surface forms.

(7-continued) -----

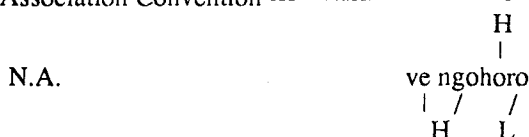
b. 3rd plural subject prefix



c. H-spread(6) -----



d. Association Convention -----



e. Surface Form -----



As Pulleyblank argues, the Morphemic Plane Hypothesis has had two results: "1) for Tiv, the rule of !-deletion can be eliminated 2) more generally, it appears that one can restrict the ability of a rule to refer to a segment's being unspecified for [F] to the class of segments targeted by a rule assigning [F] (1986b: 14)".

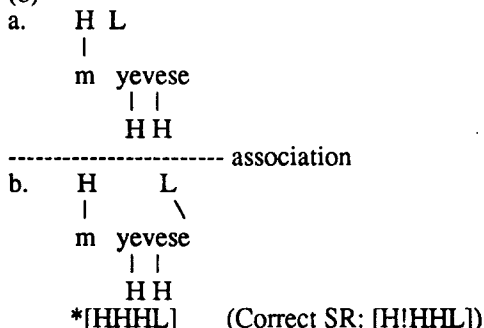
There are, however, some problems with the analysis in Pulleyblank (1986b). As Pulleyblank (1986b) notes, one problem is the tonal behavior of the first and second person singular prefixes. These prefixes have the tonal patten [H!], and thus it would be expected that the downstep marker, a floating L-tone, would be linked to stems of sufficient length; however, it is not as shown in (8).

⁶ If the stem is two syllables long, this floating L tone cannot be associated with any toneless vowel. In this case, the tonal representation will be HH!H. How can a floating L tone be realized as a downstep before a final H-tone which is a morpheme by itself? Pulleyblank (1986b) gives the following constraint:

(1)Morphosyntactic Ordering Principle:

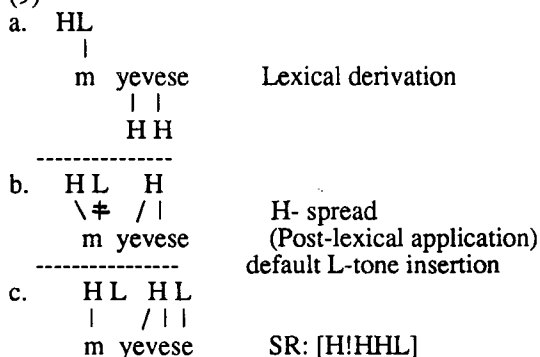
When the result of a morphosyntactic operation is an unordered tier [a], [a] aligns itself with an existing tier in a manner that preserves the morphosyntactic relation between the morphological elements concerned.

(8)



Pulleyblank suggests that the correct tonal representation for these two prefixes consists of a prelinked L as in (9a), and that the H! surface representation is derived by H-spread (6). H-spread is blocked lexically because of the strict Cycle Condition: its post-lexical application is allowed after tier conflation/bracket erasure. The derived floating L tone cannot be linked to a toneless vowel at this point (cf. (9c)) because the conflated H tone will block its association.

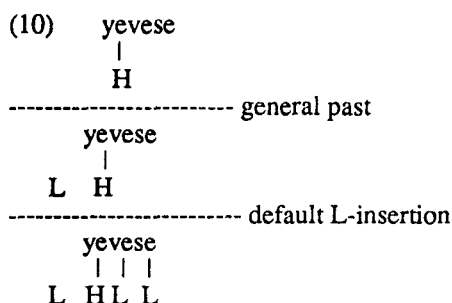
(9)



Therefore, this problematic case can be accounted for by adjusting the underlying tonal representation of /m/ and H-spread in the postlexical stratum⁷.

Another morpheme which does not undergo a floating low tone deletion (3) is the general past tense which is a floating low tone realized in front of the stem. It is not associated with a toneless vowel even if a stem has enough syllables to be associated with the floating low tone. Rather, the general past tense is always realized as a floating low tone in front of stems. Pulleyblank (1986b) assumes that the general past tense is not a morpheme per se, but is the result of a morphologically conditioned rule of phonological epenthesis. Therefore, Pulleyblank (1986b) argues that it does not constitute its own plane and thus, cannot be associated with a toneless vowel.

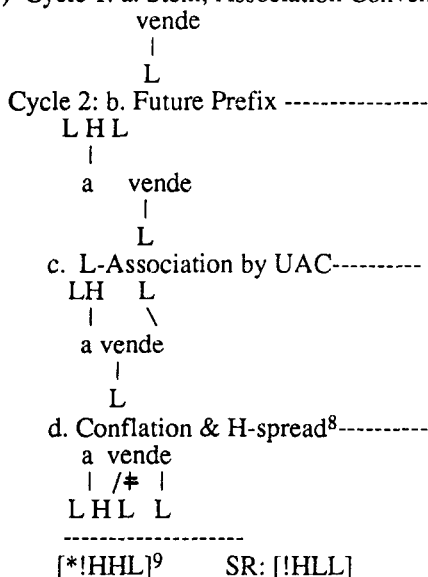
⁷ However, we will show that this modification cannot work for the first person and second person singular subjects since H-spread cannot be motivated as a postlexical rule.



These modifications are necessary in Pulleyblank (1986b) since he wants to eliminate floating low tone deletion rule.

However, even if one might want to avoid some exceptions to the low tone deletion, by utilizing different underlying representations and different interpretation of the relevant morpheme, there seems to be another serious problem which the MPH in combination with the UAC cannot explain. Let us examine what happens if a stem with a sufficient syllable length and a prelinked L-tone is prefixed with a floating L-tone. We will consider an example with the stem /vende/ and the future prefix /a/. If we follow Pulleyblank's (1986b) suggestion, the following derivations will occur:

(11) Cycle 1: a. Stem; Association Convention



In Pulleyblank (1986a), the above example is derived as follows:

⁸ We will not concern ourselves here with whether H-spread at this point occurs at the lexical level or a postlexical level, since Pulleyblank (1986b) assumes that it occurs in both levels.

⁹ A floating L does not downstep the following L tone.

(12)
Cycle 1: Stem; Association Convention---

vende

|

L

Cycle 2: Future Prefix -----

a

vende

|

|

L H L

L

Pulleyblank (1986a) suggests that H-spread does not apply in the above case "because it only spreads a H onto an immediately adjacent linked L (1986a: p145)". It does not apply if there is a floating L-tone between a triggering H-tone and an affected L-tone.

(12--continued) Post-lexical default tone insertion-----

a

vende

|

|

|

L H L

L

L

surface form [!HLL]

In (11d), however, there is no floating L tone which would block H-spread (6); rather, the floating L tone is already associated with an available vowel slot in the lexical stratum.

Will it solve the problem if we modify the underlying representation of the future prefix so that it is prelinked with a L-tone, similar to the underlying first and second person singular prefixes in (9), and derive [!H!] by H-spread in the postlexical stratum?

(13) LHL

|

a

vende

|

L

Plane Conflation in Post-lexical Stratum -----

a

vende

|

|

LHL

L

H-spread & default tone -----

a

vende

/≠

|

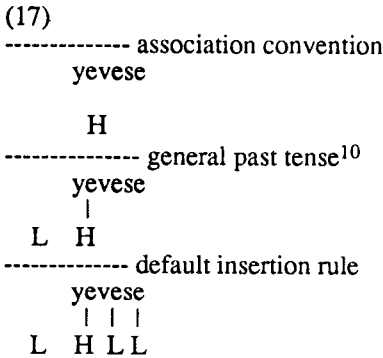
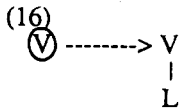
|

LHL

L

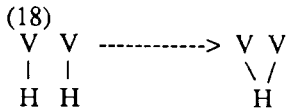
L

The representation of the future prefix with the prelinked L tone seems to solve the problem we have faced in (11). However, it does not work for stems with an initial H tone. Reconsider the examples given in (5) in which the H-initial stems are concatenated with the future prefix. For these examples we have assumed that the future prefix is prelinked with a H-tone, thus making it possible for a floating L-tone to link up with a free toneless vowel slot. If the future prefix is prelinked with a L-tone as in (14), the incorrect surface forms will be derived.

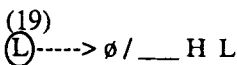


It seems that there is no suffix in Tiv which has a distinctive Low tone except the past habitual tense morpheme. We will shortly discuss the representation of this tense. In the meantime, let us assume that there is no suffix which includes a distinctive Low tone. Therefore, when rule (15) applies, the toneless vowel mentioned in (15) is not distinctive from a vowel with a low tone. Let us suppose that the low tone insertion rule has already supplied a low tone when rule (15) applies.

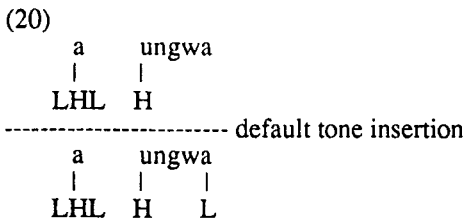
Secondly, suppose that in Tiv, after the association of tones with the vowels, adjacent identical tones are merged into one tone as is shown in (18).



With these assumptions, rule (15) can be rewritten as (19) which only mentions tone melody in its rule description.



One sample derivation is given in (20).



¹⁰ As we have noted in the previous section, floating low tone deletion does not apply to a general past tense.

----- floating low tone deletion (19)

a	ungwa	
LHL	H	L

SR: [!HHL]

Now, let us discuss the past habitual tense suffix which has a distinctive low tone. According to Pulleyblank (1983,1986b), the past habitual tense suffix is marked with 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. As Pulleyblank (1986a) notes in the endnote, the segmental n] suffix should be understood as nV] and the segmental feature of V is the copy of the preceding vowel. The vowel will be deleted by a general rule. Some paradigms of past habitual forms are given in (21).

(21) Past Habitual

	H-stem		L-stem	
1 syllable:	!váán	!HHL	!dzaan ¹¹	!HHL
	came		went	
2 syllable:	!úngwán	!HHL	vendén	LHL
	heard		refused	
3 syllable:	!yévéсэн	!HHHL	ngohoro	LHHL
	fled		accepted	

The derivation for /yevese/ in the past habitual is (22) (Pulleyblank 1986a: p88):

(22)

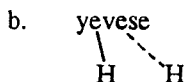
----- association convention

a. yevese
 |
 H

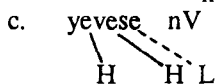
¹¹ Pulleyblank (1983) shows that a monosyllable stem with an inherent L tone undergoes the following derivation.

dza	
L	
----- H-suffix	
dza	
L	H
----- Raising: L ---> H / ____ H	
dza	
H	H
----- /-VnV, L/ insertion (an allomorph of /nV, L/)	
dza	VnV
H	H L
----- general past tense insertion	
dza	VnV
L	H H L

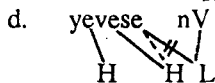
----- habitual suffix; association convention



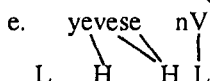
----- habitual suffix; association convention



----- H-spread, association convention

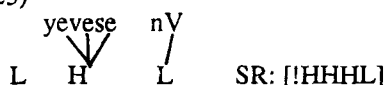


----- General Past suffix



Note that when the adjacent identical tones are merged and the representation of (22e) is thus (23), meeting the structural description of rule (19), the L-tone deletion rule (19) still does not apply. This evidence seems to argue that a floating low tone deletion applies only if there is a following toneless vowel as is formulated in (15), not if there is a following low tone vowel as is formulated in (19).

(23)

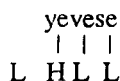


However, recall that the L-tone prefix in (23) is the general past tense marker and the general past tense is an exception to rule (19) as we have discussed in (10). Therefore, the prefixal L-tone shouldn't be deleted: the nonapplicability of rule (19) to the past habitual tense in (23) is not because of the distinctive Low tone suffix but because of the general past tense which is an exception to rule (19). Therefore, there is no distinctive difference between a toneless vowel or a vowel with a low tone in rule (19).

One more question remains. If a low tone is inserted before rule (19), isn't the environment for H-spread (6) met and might not a wrong representation thus result from its application in a postlexical stratum? For example, the /yevese/ in (17) might undergo the following incorrection derivation.

(24)

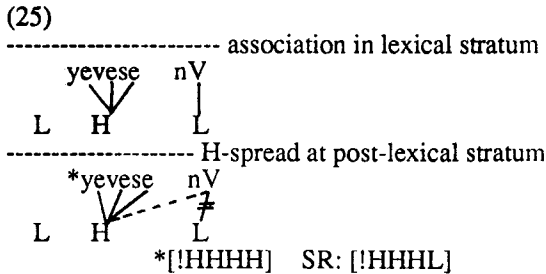
----- default L-insertion



----- H-spread (postlexical stratum)



We would like to suggest that H-spread is not a postlexical rule, but a lexical rule in Tiv¹². There is some evidence that H-spread is not a postlexical rule, but a lexical rule. As we have seen in the Past Habitual, the representation (22e) does not undergo another H-spread at the post-lexical stratum. If H-spread is a post-lexical rule, the output for /yevese/ for Past Habitual should be as follows:



Therefore, we do not have to worry about whether H-spread might apply when default features are inserted before the floating L-tone deletion rule. Therefore, the default L-deletion rule can be reanalyzed with a uniplanar representation.

4. Conclusion

In this paper, we have examined affixation process in one concatenative language, Tiv, contrasting the use of uniplanar and multiplanar representations. We have shown that in Tiv there is little evidence for any stage in which the multiplanar representation is required. It therefore follows that concatenative languages might not require Plane Conflation to convert multiplanar to uniplanar representations. Rather, in this paper we have argued that in the unmarked case, morphemes in concatenative languages are given a temporal relationship by means of both linearization of templates and linearization of sequences of melodic elements on a uniplanar representation.

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¹² Pulleyblank (1986a) also recognizes that H-spread is not a post-lexical rule but a lexical rule.

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