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YAWELMANI VERB MORPHOLOGY AND 3-DIMENSIONAL PHONOLOGY

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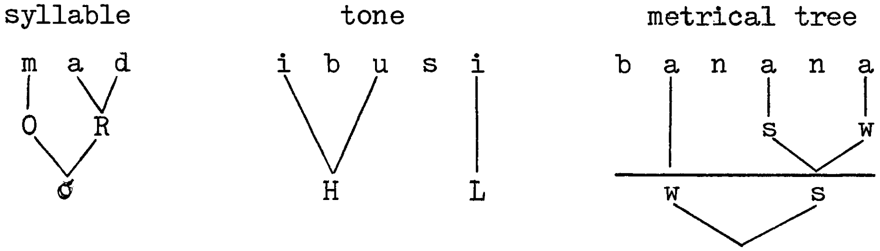
M. I. T.

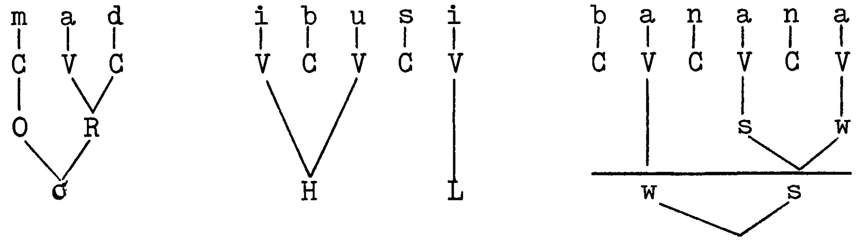
Recent work in phonology argues for a theory allowing non-linear representations, i.e. autosegmental and metrical phonology.* The initial formulations of the theory were in terms of "directly linked" representations, e.g. Kahn (1976), Goldsmith (1976), and Kiparsky (1979). In this approach, a morpheme consists of a sequence of phonemes and autosegmental tiers. The autosegmental tiers (syllables, tones, metrical trees, etc.) link directly to the phonemes.

(1)



Some of the later formulations, e.g. McCarthy (1979, 1981), Halle and Vergnaud (1980), Clements and Keyser (1981), and Marantz (1982), propose "indirectly linked" phonological representations. Here, the phonemes and prosodic elements are connected indirectly, via a C-V skeleton. A C-V skeleton consists of C slots and V slots, which indicate the positions which may be held by [-syllabic] segments ("C segments") and [+syllabic] segments ("V segments") respectively. The illustrations from (1) are given an indirectly linked representations in (2).

(2)



I assume the latter approach here. This allows the simplification of the lexical entries of Yawelmani verb roots. Previous accounts of Yawelmani verbs, e.g. Newman (1944), Kuroda (1967), and Kisseberth (1969), have all assumed six classes of verb roots, plus a wide variety of allomorphy rules triggered by certain affixes. I will demonstrate here that superficial differences in stem patterns are derivable from a set of three C-V templates (i.e. three specific C-V skeleta). Furthermore, we can dispose of the several rules creating allomorphs if we assume that the C-V template of the root may be a property of the affix, rather than of the root itself.

This is unlike the phenomena in other discussions of representations with an independent C-V tier. McCarthy (1979, 1981) shows that roots have no inherent C-V skeleta in Arabic. A C-V template is provided by the morphology (but not by an affix). Marantz (1982), Yip (1982), and McCarthy (1982) each argue for an affix (or infix) consisting of a C-V template with a phonemic melody partially specified or not specified at all. (Slots are filled by spreading the root melody or by associating a copy of the root melody.) Again, the affix does not determine the template of the root. In contrast, as we will see here, affixes in Yawelmani may determine the template for the root melody.

The problem in Yawelmani addressed here is how to represent the fact that there are basically three patterns in which the phonemes of each verb root may be combined, depending on which suffix follows the root. There are two general classes of affixes. With one affix class, the arrangement of Cs and Vs in the verb root varies, depending on which verb is selected. With the second class the C-V pattern of the root is fixed, regardless of the verb root selected. This is tabulated in (3), where the "Vs" represent the number of V slots which surface in the given root (ignoring the distribution of C slots).

The solution proposed here is that Class 1 affixes concatenate with the lexical entry form of the various verb roots, i.e. normal concatenative morphology. Class 2 suffixes, on the other hand, supply a C-V template to which the lexical entry melody associates, the earmark of non-concatenative morphology. This is elaborated in section 2. In section 1, I will present the essence of Kuroda's (1967) analysis of the lexical entries of Yawelmani verb roots. Kuroda also discusses four rules, included in section 1.

(3)

		root A	root B	root C
Class 1	Affix Q	V	VV	VVV
	Affix R	V	VV	VVV
	Affix S	V	VV	VVV
Class 2	Affix X	V	V	V
	Affix Y	VV	VV	VV
	Affix Z	VVV	VVV	VVV

1. The Class 1 Affixes: Lexical Entries of Verbs

Newman (1944) points out that there are six types of regular verbs, grouped by the arrangement of phonemes in the root. He calls the types IA1, IA2, IB, and IIA1, IIA2, IIB. We will examine examples of each root type, and see that there are rule-governed alternations in the surface manifestations of the verb roots. I will briefly discuss the rules that these alternations necessitate, namely epenthesis, vowel harmony, lowering, and shortening.

In (4), we see Newman's IA1 roots.[1] Represented here and subsequently are four verbs in each of the six root types, each exemplifying one of the four freely occuring underlying vowels in Yawelmani, /a, i, o, u/. Notice that in (4) the roots are invariant in the sense that, regardless of which affix is attached, the root always appears in a CVC pattern. Hence, I will call these the CVC roots. In examining these forms, notice also the alternations between [i] and [u] in the aorist and passive aorist and between [a] and [o] in the dubitative.

(4) CVC Verb Roots

aorist	passive aorist	dubitative	lexical entry	
cawhin	cawit	cawal	caw	'shout'
ṣil̓hin	ṣil̓it	ṣil̓al	ṣil̓	'see'
bok̓hin	bok̓it	bok̓al	bok̓	'find'
dubhun	dubut	dubal	dub	'lead by the hand'

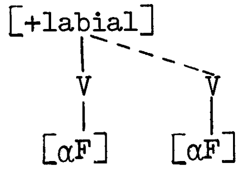
The distribution of these alternations is as follows:

(5) $i \;/\; \{i,\ a,\ o\}\ \underline{\qquad}$ $a \;/\; \{i,\ a,\ u\}\ \underline{\qquad}$

$u \;/\; u\ \underline{\qquad}$ $o \;/\; o\ \underline{\qquad}$

Following Newman, Kuroda argues for a rule of vowel harmony, rounding (and backing) /i/ after /u/ and rounding (and raising) /a/ after /o/. I have represented this rule in autosegmental terms in (6). Solid lines represent structural description and dashed lines represent structural change.

(6) Vowel Harmony (VH)



This rule says that the feature [+labial] spreads rightward onto subsequent vowels which agree in all features (except [labial], possibly) with the [+labial] vowel.[2]

Let us now turn to the next set of verb roots, Newman's IA2 roots. There are three alternations of interest here. First, we see alternations in the root form, varying between a short vowel (CVC) and a long vowel (CVVC). Following Newman and Kuroda, I argue that these roots have underlying long vowels, represented here as VV. Secondly, there are no [+high] vowels in the surface forms. Instead, we see [a,e] and [o]. Thirdly, after some [o]s we see /i/ surfacing as [u] and after other [o]s we see /a/ surfacing as [o].

(7) CVVC Verb Roots

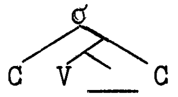
aorist	passive aorist	dubitative	lexical entry	
lanhin	laanit	laanal	laan	'hear'
hexhin	heexit	heexal	hiix	'be fat'
doshin	doosit	doosol	doos	'report'
ćomhun	ćoomut	ćoomal	ćuum	'destroy'

The alternations between long (passive aorist, dubitative) and short (aorist) root vowels are easily accounted for by a rule shortening long vowels before CC or C#, i.e. in a closed syllable. Linear and syllabic representations are in (8a,b) respectively.

(8) Closed Syllable Shortening (CSS)

a. $V \longrightarrow [-\text{long}] \; / \; \_\_\_\_ \; C\left\{\begin{matrix}\#\\ C\end{matrix}\right.$

b. $V \longrightarrow \emptyset \; /$

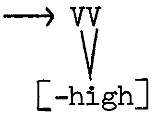


With this insight, we see that the root vowels in this class are underlying long vowels. By comparing these forms with those in (4) we see that in the roots with underlying long vowels, [+high] vowels never surface as [+high]. Kuroda postulates a rule lowering long vowels. In (9), linear and autosegmental formulations are in (a,b) respectively.

(9) Long Vowel Lowering (LVL)

a. $\begin{bmatrix}+\text{long}\\ V\end{bmatrix} \longrightarrow [-\text{high}]$

b. $VV \longrightarrow$



By ordering LVL after VH (6), we account for the alternations in *doshin*:*c̓omhun* and *doosol*:*c̓oomal*. Harmony operates on the underlying vowel heights. After VH has taken effect, LVL lowers long /u/ to [o], giving rise to the contrasts just noted.

The third verb root class (Newman's IB) is represented in (10). The roots are bisyllabic here, with a short open initial syllable and a second syllable which is sometimes long and open (aorist) and sometimes short and closed (passive aorist). The length alternations are accounted for by positing an underlying long vowel in the second syllable, subject to CSS (8) (after LVL (9)) when the syllable is closed. That VH (6) applies in *c̓uyoohun* and doesn't in *hoyoohin* assures us that in the former the second vowel is /u/ and in the latter /o/, i.e. identical in quality to the first stem vowel. The dubitative is included above to demonstrate the effect of vowel harmony on [-high] vowels. Since this has been established, I will no longer include it.

(10) CVCVV Verb Roots

aorist	passive aorist	lexical entry	
lagaahin	lagat	lagaa	'spend the night'
tiheehin	tihet	tihii	'get lean'
hoyoohin	hoyot	hoyoo	'name'
c̓uyoohun	c̓uyot	c̓uyuu	'urinate'

I will comment on the contrasts between the passive aorist in (4),(7), and (10) following the discussion of Newman's IIA1 verbs, (11) below. Here, notice the alternations between the mono-vocalic form (passive aorist) and the divocalic form (aorist).

(11) CVCC Verb Roots

?amic̓hin	?amc̓it	?amc̓	'approach'
biliṣhin	bilṣit	bilṣ	'finish'
?ogilhin	?oglit	?ogl	'emerge'
luk̓ulhun	luk̓lut	luk̓l	'bury'

As Kuroda demonstrates, the vowel /i/ is inserted between the first two consonants of a three consonant cluster, or between two consonants word-finally. With the passive aorist suffix *-t*, we have an epenthetic vowel between the two final consonants (12). When *-hin* is affixed however, the /i/ is epenthesized between the first two consonants of the cluster (13).

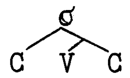
(12) ?amc̓] t ⟶ ?amc̓it (13) ?amc̓]hin ⟶ ?amic̓hin

The epenthesis rule is formulated linearly in (14a)[3] and as a resyllabification rule in (14b).[4]

(14) Epenthesis (EP)

a. $\emptyset \longrightarrow i \ / \ C \ \_\_\_ \ C \left\{ \begin{array}{l} \# \\ C \end{array} \right.$

b. C Ⓒ ⟶



where Ⓒ is unsyllabified

Given this rule of epenthesis, we see why the alternations occur in the passive aorist forms of CVC and CVVC roots vs. the CVCVV roots. With the former, affixation of -t provides the environment for EP whereas with the CVCVV roots the environment is not met. Rather, we observe LVL (9) and CSS (8). Derivations are provided:

(15)

UR	dub] t	ćuum] t	ćuyuu] t
EP	i	i	--
VH	u	u	--
LVL	--	oo	oo
CSS	--	--	∅
SR	dubut	ćoomut	ćuyot

The last two verb classes use only these four rules. Newman's IIA2 has a long/short vowel alternation in the root, which shows the application of LVL and CSS. Epenthesis applies between the two final root consonants when -hin is affixed and between the final C and the suffix when -t is affixed. These, then, are CVVCC roots. Vowel harmony applies as expected.

(16) CVVCC Verb Roots

aorist	passive aorist	lexical entry	
haatimhin	hatmit	haatm	'dance'
deeyilhin	deylit	diiyl	'guard'
boowinhin	bownit	boown	'trap'
?ookućhun	?okćut	?uukć	'rely on'

The final verb class, IIB, can be represented as CVCVVC. Here we get alternations in the length of the second syllable, depending on whether it precedes a consonant cluster (before -hin) or not (before -t, where /i/ is epenthesized).

(17) CVCVVC Verb Roots

?agayhin	?agaayit	?agaay	'pull'
binethin	bineetit	biniit	'ask'
lowonhin	lowoonit	lowoon	'attend a feast'
hudoḱhun	hudooḱut	huduuḱ	'straighten'

YAWELMANI VERB MORPHOLOGY

According to Newman, all but 40 or 50 of the verbs in Yawelmani conform to one of the six C-V patterns, or templates, represented above.[5] The templates are repeated in (18). In the first row, roots have only two C slots, and in the second row, each has three C slots: biconsonantal and triconsonantal templates respectively.

(18)	biconsonantal templates	CVC	CVVC	CVCVV
	triconsonantal templates	CVCC	CVVCC	CVCVVC

Associated with a biconsonantal template is a root with two C segments, a biconsonantal root. Triconsonantal roots, those with three C segments, are associated with triconsonantal templates. These are illustrated in (19).[6] The representation of C segments and V segments on separate tiers is justified shortly.

(19)	biconsonantal roots	c w	l n	l g
		C V C	C V V C	C V C V V
		a	a	a
	triconsonantal roots	? m c̓	h t m	? g y
		C V C C	C V V C C	C V C V V C
		a	a	a

Each lexical entry consists of a C-V template, one V segment, and two or three C segments. C-V segments are linked to corresponding slots following the universal association conventions and well-formedness condition below (from Pulleyblank 1982).

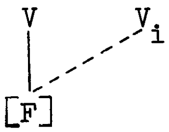
(20) Universal Association Conventions (UAC): Map a sequence of autosegments onto a sequence of autosegment-bearing units,

a. from left to right, b. in a one-to-one relation.

(21) Well-Formedness Condition (WFC): Association lines cannot cross.

A rule will then spread V segments onto empty V slots.[7]

(22) V Spread



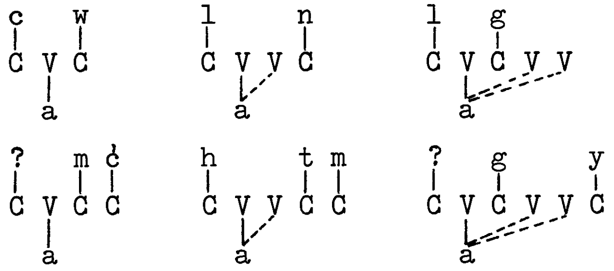
where ——— is s. d.
– – – is s. c.
V_i is one or more empty V slots

In the trivocalic roots (CVCVV and CVCVVC), for this spreading to fill all V slots, C segments and V segments must be on separate tiers, as represented in (19). Otherwise, with only one V segment, to fill all V slots, the WFC would have to be violated. Another option is to represent these roots with two V segments in the phonemic melody. However, in these roots, the (non-contiguous)

V slots always contain vowels of the same quality, although LVL (9) disguises the fact. If we assume the vowels to be on a separate tier, the one V segment will spread via (22) to fill all unoccupied V slots, and hence we explain the consistent quality of the root vowels. Placing the V segments on the same tier as the C segments does not account for this distribution. The association conventions and V Spread, when applied to the lexical entries in (19) result in the forms in (23) where —— represents UAC and WFC and – – – represents V Spread.

(23) biconsonantals

triconsonantals



2. Class 2 Affixes: Template Selecting Affixes

Slightly over half of the 45-odd suffixes found in Newman are concatenated with the lexical entries like those in (19).[8] With the other affixes, the verb roots do not conform to their underlying templates, as shown by the forms in (24), (25), (27).[9] The first column in each is the lexical C-V template of the verb. The third columns illustrate the C-V pattern assumed by bi- and triconsonantal roots with these specific affixes. Examples of some of the verbs already considered are provided in the second columns. The /?/ in parentheses in (24) and (25) is related to the glottalization on the second stem consonant, marked by an apostrophe. We will return to this in section 3.1.

Notice in (24) that biconsonantal roots all surface with a CVC pattern, regardless of the lexical entry templates. Triconsonantal roots surface as CVCC, again regardless of the lexical entry pattern. The affix (?)eexoo does not undergo vowel harmony.

(24) (?)eexoo] t 'durative] passive aorist'

	lexical template	examples	template assumed
biconsonantals	CVC	caw̓eexot	CVC
	CVVC	lan̓eexot	CVC
	CVCVV	hoy̓eexot	CVC
triconsonantals	CVCC	?am̓c̓eexot	CVCC
	CVVCC	diy̓leexot	CVCC
	CVCVVC	low̓neexot	CVCC

It is easily verified that deriving these forms from the underlying representations leads to numerous bizarre morphologically conditioned rules.[10] There are two problems with such an approach. First, this introduces a large set of specific rules for each type of these class 2 affixes. Secondly, the fact that several different rules conspire to give the two surface forms (one for bi- and one for triconsonantal roots) disguises the fact that the bi/triconsonantal surface forms obtained are in fact identical for all bi/triconsonantal roots. That is, regardless of the lexical template of a biconsonantal root, the pattern it takes with a given affix is fixed, and likewise for triconsonantal roots. Given that a variety of rules is necessary to derive the surface forms in question, there is no reason to expect that these rules should give one form for all biconsonantal roots and another for all triconsonantals. They could just as well produce six forms, one for each of the six different underlying representations.

If we say, however, that each suffix supplies a template for the verb root, we can account for the alternations between lexical templates and the examples in (24). Biconsonantal verbs, when combined with the suffix (?)eexoo, are supplied with a biconsonantal template of the form CVC. The phonemes of the root melody link to this template following the UAC (20) and WFC (21). V Spread (22) applies vacuously.

The triconsonantal verbs in (24) surface with a CVCC pattern, regardless of the template in the lexical entry. Again we may posit a C-V template, this time CVCC, selected by the suffix.

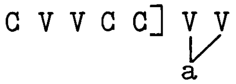
In (25), inspection reveals that the continuative suffix is affixed to a CVVC template with biconsonantal roots and to a CVCC pattern with triconsonantals. Again, it is easy to see that rules inserting and deleting V slots can be constructed to give the right results. However, such rules are subject to the same criticisms leveled in the discussion of (24) above. Instead, I propose a CVVC template for the biconsonantal roots.

(25) (?)aa] hin 'continuative] aorist'

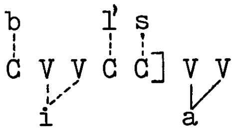
	lexical template	examples	template assumed
biC	CVC	ṣeel̓aahin	CVVC
	CVVC	c̓oom̓aahin	CVVC
	CVCVV	hooy̓oohin	CVVC
triC	CVCC	bel̓ṣaahin	CVVCC
	CVVCC	bow̓noohin	CVVCC
	CVCVVC	ben̓taahin	CVVCC

For triconsonantal roots, although a CVCC pattern surfaces, I claim that in underlying representation, it is a CVVCC template. The surface form is due to CSS (8). Evidence for this is provided by the fact that none of the root vowels surface as [+high]: roots that show a high vowel in underlying representation surface with a [-high] vowel. This indicates that they are in fact long vowels, and as such undergo LVL (9). The derivation of <u>bel̓ṣaahin</u> illustrates the application of these rules (ignoring the alternation between /l/ and [l̓] for the moment).

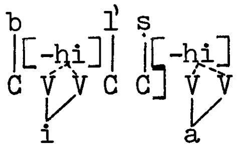
(26) a. template + suffix



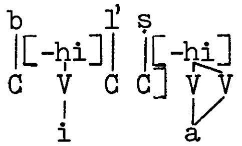
b. insert melody & associate



c. LVL (9)



d. CSS (8)



e. SR (with affixation) bel̓ṣaahin

In (26c) the feature [-high] is represented on a separate level. This is to indicate that it it on its own tier, independent of the C segment tier and of the V segment tier.

In (26a), we see the suffix affixed to the C-V template. The verb melody is inserted and associated with the C-V template in (26b). Application of LVL associates the feature [-high] with the adjacent V slots, (26c). In (26d), CSS removes one of the V slots before the consonant cluster. Notice that assuming the CVVCC template for triconsonantal roots gives the right results if we employ rules motivated independently. If we assume a CVCC template, we must add a lowering rule which applies only in this morphological class.

In (27) we observe yet other C-V patterns. A quick glance down the columns shows that biconsonantal roots and triconsonantal roots each conform to one pattern regardless of lexical entry form. The biconsonantal roots in (27) all surface with a CVCV pattern. The second vowel is always [-high], even when the underlying vowel is [+high], e.g. <u>ṣil̓ewsel</u>, <u>čumowsol</u>. We may assume, as we did in the discussion of the triconsonantal roots in (25), that the underlying template has a long vowel which undergoes LVL (9) and CSS (8). Thus we have a CVCVV template surfacing as CVCV.

The triconsonantal roots surface with a CVCVVC pattern, with the expected [-high] vowel in the long syllable. The vowel between the root final consonant and the suffix initial consonant cluster is the epenthetic /i/ placed by EP (14).

(27) wsiil 'reflexive/reciprocal adjunctive'

	lexical template	examples	template assumed
biC	CVC	ṣil̓ewsel	CVCVV
	CVVC	c̓umowsol	CVCVV
	CVCVV	hoyowsel	CVCVV
triC	CVCC	bileeṣiwsel	CVCVVC
	CVVCC	bowooniwsel	CVCVVC
	CVCVVC	bineetiwsel	CVCVVC

The suffix-selected templates motivated above are listed in (28). Those in (28a) correspond to the templates selected in (24). Those in (28b) correspond with those selected in (25), and (28c) with (27).

(28)

a.		b.		c.	
a.	CVC	b.	CVVC	c.	CVCVV
	CVCC		CVVCC		CVCVVC

There are three noteworthy points here. First, the templates given in (28) are the only templates selected by affixes in Yawelmani. No others need be considered. Secondly, the set of templates selected by the affixes is identical to the set available for the underlying representations of verbs (see 18). In other words, affixes take something from an already existing template pool; they cannot create new templates. Finally, the templates come in pairs, which vary by the presence or absence of a final C slot. A suffix which selects a biconsonantal template of, say, the (28a) pattern (CVC) also selects the (28a) triconsonantal template (CVCC). There are no pairings which mix templates (i.e. *CVC/CVVC, *CVC/CVCVVC, *CVVC/CVCC, etc.). Following a suggestion by Malka Rappaport, I will argue that this pairing is derived from the fact that only the triconsonantal template is involved. It is not necessary to posit a separate biconsonantal template in Yawelmani.

The argument has two steps. First, I will show that a triconsonantal template is necessary for the majority of template-selecting suffixes, regardless of the number of C segments in the root melody. These suffixes fall into two classes. For one of them, we must argue that C segments do not spread onto empty C slots. Once it is established that C segments do not spread, we may assume a triconsonantal template with both bi- and triconsonantal roots: With biconsonantal roots, the third, unassociated C slot simply does not surface.

3. Triconsonantal Templates.

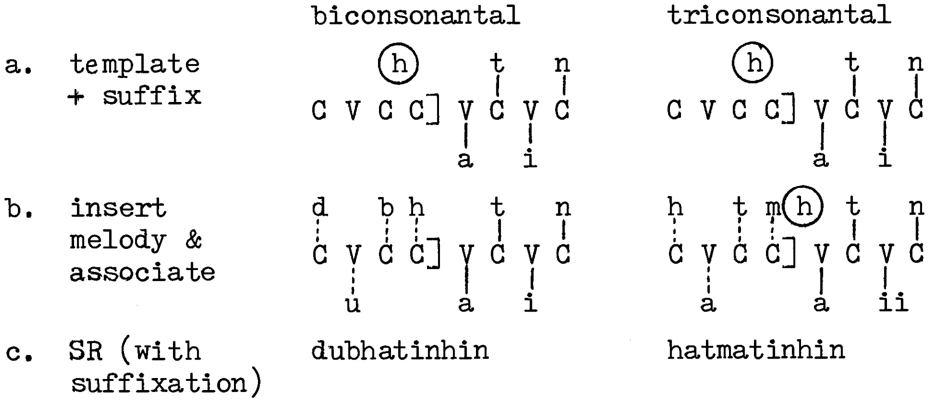
Let us turn now to the evidence for triconsonantal templates to the exclusion of biconsonantal templates. Consider the paradigms in (29). We see the CVC(C) template has been selected, but notice the contrast in suffix form for bi- and triconsonantal roots.

(29) hatin] hin 'desiderative] aorist'

	lexical template	examples		lexical template	examples
biC	CVC	dubhatinhin	triC	CVCC	?oglotinhin
	CVVC	doshotinhin		CVVCC	hatmatinhin
	CVCVV	laghatinhin		CVCVVC	hudḱatinhin

With the biconsonantals, we see an [h] initial suffix, but the [h] does not surface with triconsonantals. We can account for this contrast very simply by positing a floating /h/ as part of the lexical entry of the affix. As shown in the derivations in (30), if a biconsonantal melody is inserted, the floating /h/ gets associated with the empty C slot. On the other hand, if a triconsonantal melody is inserted, there is no empty C slot, and the floating /h/ cannot link, and so cannot surface.[11]

(30)



Clearly, this affix, and the other two like it, demands a triconsonantal template. There are two reasons why we cannot say that /h/ is the "unmarked consonant" which fills a C slot whenever empty. First, of the other two suffixes with floating C segments, one has /l/ as the floater (the other has /h/). Secondly, the empty C slot does not necessarily get filled, as the behavior of the glottal feature shows (discussed below).

3.1 Glottalized Consonants

Affixes which are marked here with an initial "(?)", e.g. (?)eexoo and (?)aa show a three-way surface contrast. With some roots, the same distribution as the floating /h/ is observed.

(31)

biconsonantal roots	dub?eexot	dob?aahin
triconsonantal roots	?ogleexot	?ogloohin

With other roots, the second stem consonant surfaces as glottalized, regardless of underlying representation and regardless of whether the root is bi- or triconsonantal.

(32)	biconsonantal roots	caw̓eexot	caw̓aahin
	triconsonantal roots	bow̓neexot	bow̓noohin

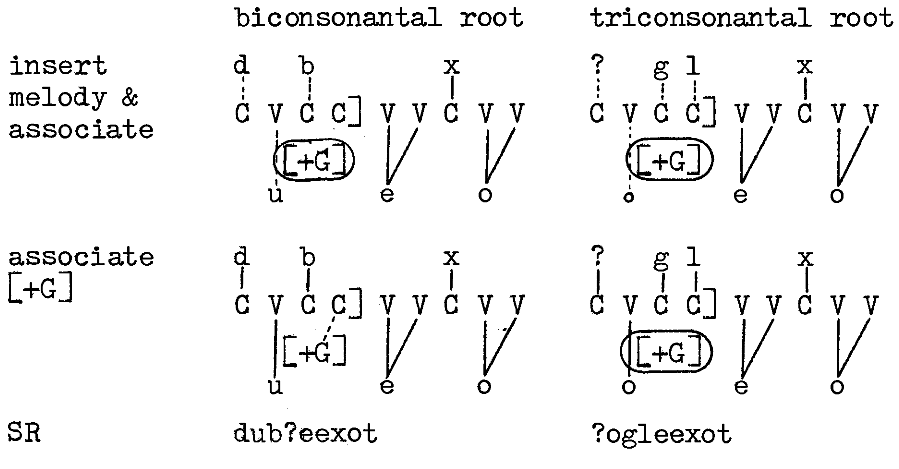
The full paradigm of (?)eexot is given in (33) to illustrate the contrast. (When (?)aa is affixed, the distribution of glottalization is identical, but the template selected is different.) In (33) there are two columns. (33a) corresponds to (32) and (24). (33b) shows some other verbs discussed in section 1 and corresponds to (31). As Newman observes, the difference between (33a) and (33b) is that in (33a), where the second root consonant surfaces as glottalized, this consonant is a sonorant. In (33b), it is not sonorant.

(33) (?)eexoo] t 'durative] passive aorist'

	a.	b.
biC	caw̓eexot	dub?eexot
	lan̓eexot	hix?eexot
	hoy̓eexot	lag?eexot
triC	?am̓c̓eexot	?ogleexot
	diy̓leexot	hatmeexot
	low̓neexot	hudk̓eexot

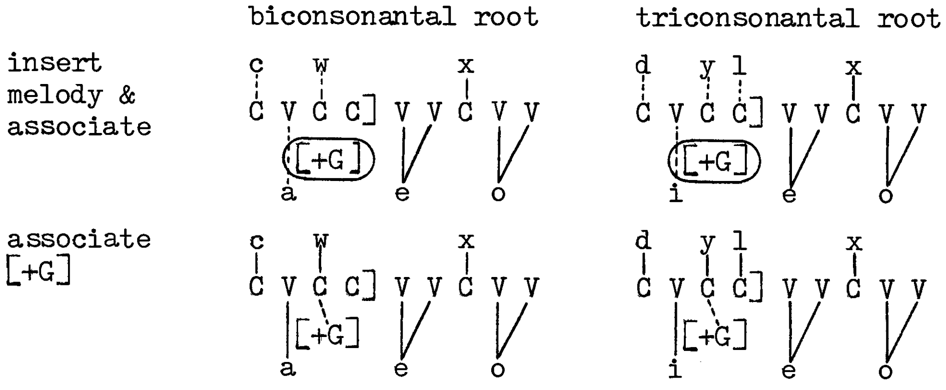
Without going into a detailed representation of the mechanics of glottalization, I will make a few pertinent observations. First, because of (33b), we may assume that a triconsonantal template is selected by "(?)"-initial affixes, regardless of the number of C segments in the lexical melody. In case the second C slot is associated with a sonorant, the glottal feature (here "[+G]") will associate to that slot by rule. Otherwise it will be linked to an empty C slot, if any (again by rule). (34) provides derivations with bi- and triconsonantal roots illustrating the latter case. (The rules are made explicit in Archangeli 1982.)

(34)



If the second root consonant is sonorant, [+G] associates with the second C slot and the sonorant surfaces as glottalized, as in (35).

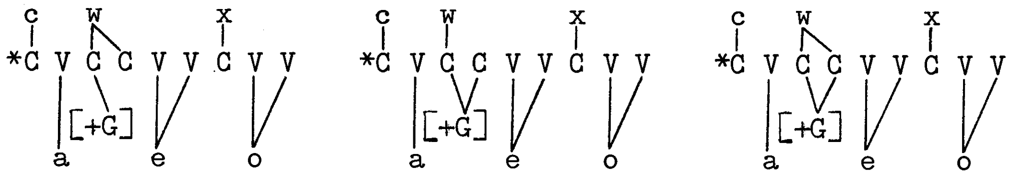
(35)



SR caw̓eexot diy̓leexot

Note that these derivations follow only if we assume that C segments do not spread automatically. If segments spread automatically onto empty slots, we would expect one of the forms in (36).

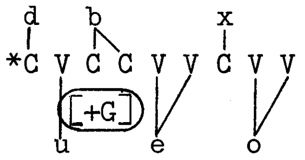
(36)



*caw̓weexot *caw̓?eexot *caw̓w̓eexot

Furthermore, the ?/? would never surface in biconsonantals without sonorants (as we saw it does in (34)) since there would be no empty C slot available for association.

(37)



*dubbeexot

Assuming that C segments do not spread automatically onto empty C slots also accounts for the absence of geminates in Yawelmani. The only geminates found are those which arise by concatenating a word ending with C_i and a suffix beginning with C_i.[12]

Once we assume that consonants do not spread, we can allow a biconsonantal root to associate with a triconsonantal template even when no floating segments exist: The unassociated C slot will not surface. This holds whether the template is selected by an affix or is part of the verb's lexical entry. The template pool is thus reduced to three templates, given in (38).

(38) Template Pool for Yawelmani

a. CVCC b. CVVCC c. CVCVVC

4. Conclusion

Here I have provided additional support for an independent C-V tier, based on Yawelmani verb morphology. I have also demonstrated the necessity for a theory which allows affixes to determine root templates.

Yawelmani is interesting in two ways. First, root melodies may associate with either a lexical template or a morphologically supplied template. Yet, given a theory in which the C-V skeleton is independent of the autosegmental tiers, we would expect to find a language exactly like Yawelmani, i.e. a language which uses both lexical and morphological templates for a given root. Secondly, it is the affix which determines the root template in Yawelmani. This is expected in a head-based theory of morphology, e.g. Lieber (1980). Features of the head take precedence over features of the inserted morphemes. The suffixes in Yawelmani are heads (e.g. they change verbs into nouns or adjuncts) and they also may replace the lexical template of the verb root. What we do not expect to find is a language in which the root determines the C-V template of the affixes, if said affixes are the heads.[13]

FOOTNOTES

*Special thanks are due to Morris Halle, Mike Hammond, Jim Harris, Paul Kiparsky, K.P. Mohanan, and particularly Doug Pulleyblank for many discussions of previous versions of this paper.

[1] The source for Yawelmani is Newman (1944). For expository purposes I have used the same 24 verbs throughout to illustrate the various paradigms. Specific forms cited here are not necessarily given in Newman, but parallel ones are (or are described).

[2] Clearly this rule does not account for the backing of /i/ and the raising of /a/. Following Kiparsky (1982), I assume that redundant features are filled in later by rule. This means that when VH applies, the values for [back] and [low] are not part of the feature matrices. Thus, /i/ and /u/, /a/ and /o/ are identical in representation except for the value of [labial]. Once [+labial] spreads onto the V slots associated with the (underspecified) features for /i/, /a/, the representations are identical to those of /u/, /o/ respectively. The redundancy rules fill in the remaining values. For a complete discussion, see Archangeli and Pulleyblank (in prep.).

[3] Kuroda (1967) also assumes (quite rightly, I think) that there is a rule deleting vowels in short open syllables following

open syllables. I have omitted this for simplicity. However, because of the deletion rule, Kuroda's formulation of the epenthesis rule is not the same as the rule in (14a). See Kuroda (1967).

[4] I am assuming that the quality of the V slot inserted by (14) will be derived from redundancy rules. See footnote 2 for discussion.

[5] Some of the irregular verbs cited in Newman are pitiilsii- 'teach', yaxwis- 'quarrel reciprocally with one's spouse', and panwix- 'bring'. These are treated in the same manner as a verb+suffix sequence (see footnotes 8,9).

[6] Interestingly, Newman refers to these as "biliterals" and "triliterals", just as roots in Arabic have traditionally been designated. I have not been able to ascertain whether he realized the similarity between the two languages.

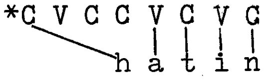
[7] Note that Williams (1976), Goldsmith (1976), and Halle and Vergnaud (1981) all assume that spreading of this sort is automatic. Here I follow Pulleyblank (1982) in assuming that one-to-one linking is automatic but that spreading occurs by rule only.

[8] There are no prefixes in Yawelmani. Suffixes may be classed in two ways, by what they attach to (root or affix) and by where they are in a sequence (word-final or non-word-final). Those affixes which attach only to a verb+affix sequence may also attach directly to an irregular verb. Affixes which attach directly to the root include all of the template-selecting affixes.

[9] The irregular verbs discussed in footnote 5 do not associate with templates selected by affixes. They simply do not undergo affixation with these suffixes.

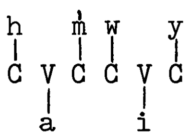
[10] The hypothetical V deletion rules are essentially the solution proposed in Kuroda (1967) and in Kisseberth (1969).

[11] Note that I am assuming a crucial ordering here: A template is inserted and a root melody is inserted prior to association of segments to slots. If association occurs wherever empty slots and unassociated segments line up, the floating consonants in (30) would always be associated with the first C slot.

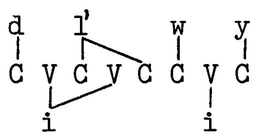


If one wishes to maintain the more restrictive view, that association occurs whenever the environment is met, one has two options. First, the root melody could be inserted prior to template insertion. Secondly, the /h/ could be marked as "extra-melodic" rather than as floating. As an extra-melodic segment, it would not be available for association as long as it is on the edge of a domain. When it is no longer peripheral, i.e. when the melody of the root is inserted, it ceases to be extra-melodic and is therefore available for association.

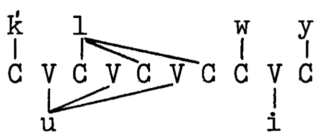
[12] This is not quite true. In children's speech, verbs are made by suffixing -*wiy*- 'do,say' to onomatopoeic syllables, or other "proclitics" to use Newman's term. These are of three types, "biliteral" or CVC, "triliteral" or CVCVC, and "quadriliteral" or CVCVCVC. In my terms, these have bi-, tri-, and quadriconsonantal templates, but primarily biconsonantal melodies since we see what may be interpreted as C segments spreading onto empty C slots. This accounts elegantly for the fact that, with the vast majority of the -*wiy*- verbs, the second and subsequent consonants are of identical quality.



'cave in'



'be sloping'



'roll along'

The triconsonantal -*wiy*- verbs sometimes drop the final syllable (*wiy*) and permit affixation directly to the remainder. In this way they act exactly like triconsonantal roots. Geminates sometimes arise when a CVCC or CVVCC template is selected.

[13] This observation was made by Paul Kiparsky.

REFERENCES

Archangeli, D. 1982. The root CV template as a property of the affix: Evidence from Yawelmani. MIT ms.

Archangeli, D. In prep. Topics in Yawelmani phonology.

Archangeli, D. and D. Pulleyblank. In prep. Vowel harmony.

Clements, G.N. and S.J. Keyser. 1981. A three-tiered theory of the syllable. The Center for Cognitive Science, Occasional Paper #19. MIT, Cambridge, Massachusetts.

Goldsmith, J. 1976. *Autosegmental Phonology*. Doctoral dissertation, MIT, Cambridge, Massachusetts.

Halle, M. and J.-R. Vergnaud. 1980. Three dimensional phonology, *Journal of Linguistic Research 1*, 83-105.

Kahn, D. 1976. *Syllable-based Generalizations in English Phonology*. Doctoral dissertation, MIT, Cambridge, Massachusetts.

Kiparsky, P. 1979. Metrical structure assignment is cyclic. *Linguistic Inquiry* 10: 421-441.

Kiparsky, P. 1982. Lexical phonology and morphology. To appear in I.-S. Yange, ed., Linguistics in the Morning Calm. Seoul, Korea.

Kisseberth, C. 1969. Theoretical Implications of Yawelmani Phonology. Doctoral dissertation, University of Illinois.

Kuroda, S.-Y. 1967. Yawelmani Phonology. Research Monograph No. 43. The MIT Press. Cambridge, Massachusetts.

Lieber, R. 1980. On the Organization of the Lexicon. Doctoral dissertation, MIT, Cambridge, Massachusetts.

Marantz, A. 1982. Re reduplication. Linguistic Inquiry 13:435-82.

McCarthy, J. 1979. Formal Problems in Semitic Phonology and Morphology. Doctoral dissertation, MIT, Cambridge, Massachusetts.

McCarthy, J. 1981. A prosodic theory of nonconcatenative morphology morphology. Linguistic Inquiry 12: 373-418.

McCarthy, J. 1982. Language games in nonconcatenative morphology. Paper presented at Harvard University.

Newman, S. 1944. Yokuts Language of California. New York: The Viking Fund Publications in Anthropology #2.

Pulleyblank, D. 1982. Tiv nd the association conventions. Paper presented at NELS XIII, Montreal, Canada. (Originally titled "A lexical treatment of tone in Tiv".)

Williams, E. 1976. Underlying tone in Margi and Igbo. Linguistic Inquiry 7: 463-484.

Yip, M. 1982. Reduplication and C-V skeleta in Chinese secret languages. Linguistic Inquiry 13: 637-661.