NOTES ON DIUXI MIXTEC TONE

John P. Daly

0. In this paper I give a brief description of a reanalysis of the tone system of Diuxi Mixtec previously analyzed by Eunice Pike and Joy Oram (1976). Their analysis is heavily influenced by their conception of probable phonetic manifestations of tone, whereas my analysis is more influenced by morphophonemic considerations. Giving more attention to morphophonemic considerations in determining tone phonemes makes possible a simpler account of the morphophonemics of tone. This account, however, is not at the expense of phonetic simplicity but is compatible with a phonetically reasonable and relatively simple account of allophonic processes.[1]

1. Pike and Oram (P & O) posit two tones, high and low, and one degree of stress. Stress is said to be contrastive on the ultimate syllable of stems but to be present always on the penultimate syllable and always absent on the antepenultimate syllable. A monosyllabic enclitic occurs both with and without stress depending on whether the preceding morpheme conditions its presence or not.

In all previous descriptions of Mixtec languages it has been claimed that there is only one stress to a word. Stress is said to occur on the first syllable of bisyllabic morphemes (the most common pattern) with monosyllabic morphemes being unstressed. In my view Diuxi Mixtec, like other Mixtec languages, has only one (grammatically predictable) stress to a word and that which P & O call contrastive stress should not be identified with the predictable stress. Furthermore, their nonpredictable stress should not be restricted to the ultimate syllable of stems and to monosyllabic enclitics, but it should be recognized as occurring on any syllable, including the predictably stressed ones.

Predictable stress I will call simply stress. Non-predictable stress which P & O recognize, as well as other instances of the same phenomenon, is of a different sort and should be recognized as a feature of tone. This feature, which can be called Modification,[2] combines with the feature High that is needed for the contrast between high and low tones to give four tones: modified high ('H), unmodified high (H), modified low ('L) and unmodified low (L).

In the reanalysis, every configuration of the four tones is possible on a sequence of two syllables with the exception that a modified low tone is never followed by a modified low tone. Whenever tone modification would otherwise occur on each of two low-tone syllables, the second tone loses its modification. This reduces the number of possible tone combinations on bisyllabic morphemes to fifteen. Of these, seven patterns are basic: HL, LL, 'LL, L'L, L'H, 'L'H and H'H; the rest are derived.

I will give next my version of the morphophonemics of tone involving pairs of bisyllabic morphemes,[3] then give my version of the phonetics of tone and finally make some further comparisons between the two analyses.

2. Table I gives combinations of tone patterns found in sequences of two morphemes.[4] Each of the morphemes at the top of a column is followed by each of the morphemes at the end of a row. The tones of each pair of morphemes are given at the intersection of the columns and rows. Given in parentheses are examples of tone combinations not given in the chart of P & O, an adaptation of which I will give later.

TABLE I SEQUENCES OF BISYLLABIC MORPHEMES

		-A			+A			
I	II	III	IV	V	VI	VII		
LL	'L L	L'H	H'H	H'H	'L L	L L		
++	diko	ba?a	uu	koo	luči	ka?nu		
one	*is sold*	*good*	*two*	*four*	*small*	*large*		
		'L'H (ll?l) *rooster*		L'H (d+?+) *wife*	L'L (žuči) *knife*	H L (čuju) *fly*		
LL HL	'LL HL	LH LL ('LH)	HH LL	H'H HL~ HH 'HL	'LL HL~ 'LL'HL	LL HL~ LL'HL (HL)	H L čaka *fish*	A
LL 'LL	'LL HH	LH 'LL ('LH)	HH HL	HH HL (LH)	'LL HL (LL)	LL 'LL (HL)	'L L lelu *hat*	B
LL LL	'LL HH	LH LL ('LH)	HH HL	HH HL (LH)	'LL 'HL (LL)	LL 'LL (HL)	L L k+t+ *animal*	C
LL L'L	'LL HH	LH L'L ('LH)	HH H'L	HH H'L (LH)	'LL 'H'L (LL)	LL 'LL (HL)	L'L L'L žuči/ dito *knife uncle*	D
LL L'H	'LL H'H	LH L'H ('LH)	HH L'H	HH 'H'H (LH)	'LL H'H (LL)	LL 'L'H (HL)	L 'H L'H tatna/ d+?+ *medicine wife*	E
LL'L'H	'LL H'H	LH 'L'H ('LH)	HH 'H'H	HH 'H'H (LH)	'LL 'H'H (LL)	LL 'L'H (HL)	'L'H 'L'H ll?i/ kuči *rooster pig*	F

In column I appear the basic tones of each tone class following the numeral one. In each of the other columns one or more of the tones undergo a change. Notice that the only regressive perturbation is the loss of tone modification word finally. Every such syllable loses its modification except that in V A modification appears on the word final syllable if it does not transfer to the next following syllable. All other cases of tone perturbation are progressive. In column II both tones may be changed. In VII D modification is lost on the second syllable. In all other cases of progressive perturbation, the first tone only is changed.

The morpheme classes which condition change in a following morpheme are differentiated partially by their tone patterns and partially arbitrarily . I mark the classes represented in I-IV as [-A] and the ones in V-VII as [+A] so as to differentiate between arbitrary subclasses of morphemes with identical tone patterns but different perturbing power. In the informal statement of the morphophonemic rules I will refer to the numbers I-VII and make use of the feature [A] in the formal rules.

The feature [Derived] appears in one rule only for the purpose of identifying a tone which has a derived feature specification that regains the specification it had in its basic form. In all other cases a rule applies to basic feature specifications only.

Modification Addition

A low tone becomes modified (a) following class VII morphemes, (b) following class VI morphemes if the low tone is followed by a low tone and (c) following class V morphemes if the low tone is followed by a high tone.

(1) Modification Addition

$$\begin{bmatrix}-\text{Mod}\\-\text{High}\end{bmatrix} \rightarrow [+\text{Mod}] \;/\; \left\{ \begin{array}{lll} [-\text{Mod}] & \begin{bmatrix}-\text{Mod}\\+\text{A}\end{bmatrix} & \#\_\_\_\_ \\ \begin{bmatrix}-\text{High}\\ \alpha\text{Mod}\end{bmatrix} & \begin{bmatrix}-\text{High}\\ -\alpha\text{Mod}\\+\text{A}\end{bmatrix} & \#\_\_\_\_[-\text{High}] \\ & \begin{bmatrix}+\text{High}\\+\text{A}\end{bmatrix} & \#\_\_\_\_[+\text{High}] \end{array} \right\}$$

VII C	L L ka?nu *large*	+	L L k+t+ *animal*	
	L L ka?nu		'L L k+t+	Modification Addition
VI D	'L L luči *small*	+	L'L žuči *knife*	
	'L L luči		'L'L žuči	Modification Addition
	'L L		'H'L	Surface (see rule 5)
V E	H'H koo *four*	+	L 'H tatnạ *medicine*	
	H'H koo	+	'L 'H tatnạ	Modification Addition
	HH koo		'H 'H tatnạ	Surface (see rules 3 and 5)

Modification Adjustment

A high tone is optionally modified following classes V-VII (A of V-VII). If the high tone becomes modified, tone modification on an immediately preceding syllable is lost (V A).

(2) Modification Adjustment 1 (opt)

[+A] # [+High] --> [-Mod] # [+Mod]

V A	H'H koo *four*	+	H L čaka *fish*	
	HH koo		'H L čaka	Modification Adjustment 1 or
	H'H koo		H L čaka	Surface
VI A	'L L luči *small*	+	H L čaka *fish*	
	'L L luči		'H L čaka	Modification Adjustment 1 or
	'L L luči		H L čaka	Surface

Word final tone modification is lost before any tone not specified in the structural description of rule 2. It is not lost phrase finally.

(3) Modification Adjustment 2

[+Mod] --> [-Mod] / _____ # [+Tone]

Disjunctively ordered in respect to Modification Adjustment 1

V C	H'H		L L	
	koo	+	k+t+	
	four		*animal*	
	HH		L L	
	koo		k+t+	Modification Adjustment 2
IV *E*	H'H		L 'H	
	uu	+	tatnạ	
	two		*medicine*	
	HH		L 'H	
	uu		tatnạ	Modification Adjustment 2
	HH		H 'H	
	uu	+	tatnạ	Surface (see rule 4)

Tone Raising

A low tone or a sequence of two low tones becomes unmodified high tone(s) following class II morphemes. Notice that the two tones which are already high retain their modification (II E,F). The morphemes which cause this change are a subclass of 'LL morphemes, possibly consisting entirely of verbs in the continuative aspect with this tone pattern.

(4) Tone Raising 1

$$[\ -\text{High}]\ \ (\ \ [-\text{High}]\ )\ \ \text{--->}\ \ \begin{bmatrix}+\text{High}\\-\text{Mod}\end{bmatrix}\ \ (\ \begin{bmatrix}+\text{High}\\-\text{Mod}\end{bmatrix}\ )$$

$$/\ \begin{bmatrix}+\text{Mod}\end{bmatrix}\qquad \begin{bmatrix}-\text{High}\\-\text{A}\end{bmatrix}\qquad \#\ \_\_\_\_$$

II B	'L L		'L L	
	diko	+	lelu	
	sell		*hat*	
	'L L		H H	
	diko		lelu	Tone Raising 1

II F	'L L		'L'H	
	diko	+	li?i	
	sell		*rooster*	
	'L L		H'H	
	diko		li?i	Tone Raising 1

A low tone becomes high tone following classes IV-VI. In one instance a basic low appears as low in the surface (IV E). This will be provided for by allowing the rule that changes low to high to operate without exception and by changing the derived high to low again by a rule of tone lowering. This rule will apply to the derived high and to basic high tones.

(5) Tone Raising 2

$$[-\text{High}] \longrightarrow [+\text{High}] \;/\; \left\{ \begin{matrix} [\alpha\ \text{Mod}]\ [-\alpha\text{Mod}\ +\text{A}] \\ [+\text{High}]\ [+\text{High}\ -\text{A}] \end{matrix} \right\} \quad \#\ \_\_\_\_$$

IV F	H'H		'L'H	
	uu	+	li?i	
	two		*rooster*	
	HH		'L'H	
	uu	+	li?i	Modification Adjustment 2
	H H		'H'H	
	uu	+	li?i	Tone Raising 2
V C	H'H		L L	
	koo	+	k+t+	
	four		*animal*	
	HH		L L	
	koo		k+t+	Modification Adjustment 2
	HH	+	H L	
	koo		k+t+	Tone Raising 2
V B	H'H	+	'L L	
	koo		lelu	
	four		*hat*	
	HH	+	'L L	
	koo		lelu	Modification Adjustment 2
	HH	+	'H L	
	koo		lelu	Tone Raising 2
	HH		H L	
	koo		lelu	Surface (see rule 7)

Tone Lowering

A basic high tone becomes low tone following classes III and IV. A high tone derived by tone raising from L'H morphemes returns to low (IV E).

(6) Tone Lowering

$$[+\text{High}] \longrightarrow [-\text{High}] \;/\; \begin{bmatrix} +\text{High} \\ -\text{A} \end{bmatrix} \quad \# \quad \left\{ \begin{bmatrix} \overline{\text{-Derived}} \end{bmatrix} \;\; \begin{bmatrix} \overline{\quad} \\ +\text{Derived} \\ -\text{Mod} \end{bmatrix} \right\} [+\text{High}]$$

III	A	L'H ba?a *good*	+	H L čaka *fish*	
		L H ba?a		H L čaka	Modification Adjustment 2
		L H ba?a	+	L L čaka	Tone Lowering
IV	E	H'H uu *two*		L 'H tatnạ *medicine*	
		HH uu		L'H tatnạ	Modification Adjustment 2
		HH uu		H 'H tatnạ	Tone Raising 2
		HH uu		L 'H tatnạ	Tone Lowering

Modification Deletion

Tone modification is lost if followed by a low tone and preceded by classes IV - VI (B IV - VI).

(7) Modification Deletion

$$[+\text{Mod}] \longrightarrow [-\text{Mod}] \;/\; \left\{ \begin{matrix} [\alpha\text{Mod}] & \begin{bmatrix} -\alpha\text{Mod} \\ +\text{A} \end{bmatrix} \\ [+\text{High}] & \begin{bmatrix} +\text{High} \\ -\text{A} \end{bmatrix} \end{matrix} \right\} \# \_\_\_\_ [-\text{High}]$$

V B	H'H	'L L	
	koo	lelu	
	four	*hat*	
	HH	'L L	
	koo	lelu	Modification Adjustment 2
	HH	'H L	
	koo	lelu	Tone Raising 2
	HH	H L	
	koo	lelu	Modification Deletion 1

Tone modification on a low tone following a modified low tone is lost (VII D).

(8) Modification Deletion 2

$$\begin{bmatrix}-\text{High}\\+\text{Mod}\end{bmatrix} \dashrightarrow [-\text{Mod}] \;/\; \begin{bmatrix}-\text{High}\\+\text{Mod}\end{bmatrix} \_\_\_\_$$

VII D	L L	L'L	
	ka?nu	žuči	
	large	*knife*	
	L L	'L'L	
	ka?nu	žuči	Modification Addition
	L L	'L L	
	ka?nu	žuči	Modification Deletion 2

3. In specifying the phonetic variants of the four tones two new features [Mid] and [Downstep] will be introduced. [Mid] pairs with [High] to give: [+High, -Mid] a phonetically high tone, [+High, +Mid] a phonetically mid tone, [-High, +Mid] a phonetically falling low tone and [-High, -Mid] a phonetically low tone. The feature specification [+ Mod] is found in combination with [+High, -Mid] and [+High, +Mid] to add a short downward glide to a high or mid tone. [+Mod] in combination with [-High, -Mid] has no phonetic effect, the tone being at low pitch. [+Mod] never occurs in combination with [-High, +Mid] . The feature specification [+Downstep] occurs only in combination with [+High, -Mid, -Mod] and [+High, -Mid, +Mod] and specifies the unmodified or modified high tone as high in relation to following tones but as mid in relation to preceding tones. Thus, a down-stepped high will be lower than a preceding high but the same height as a following high and higher than a following mid or low.

A high tone is downstepped following a high tone plus one or more unmodified low tones or following pause plus one or more unmodified low tones. Elsewhere a high tone is phonetically high.

(9) Downstep

$$[+\text{High}] \dashrightarrow [+\text{Downstep}] \,/\, \left\{\begin{matrix}[+\text{High}]\\ //\end{matrix}\right\} \begin{bmatrix}-\text{High}\\-\text{Mod}\end{bmatrix}_1^n \_\_\_\_$$

VII C

H L
čuju
fly

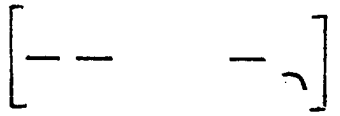
H L
čaka
fish

The low tone of H L čuju is mid (see 10) and the high tone of H L čaka is downstepped to the pitch of the preceding tone.

V D

L H
d+ʔ+
wife

H'L
dito
uncle



The low tone of the LH pattern is mid (see 10) and the high tone is downstepped to the level of the preceding tone. The high tone of the H'L pattern is on the same pitch as the preceding downstepped high and the modified low tone is a mid tone in relation to the preceding high and ends in a short downglide.

One or more unmodified low tones are falling low tones (a) when preceding a modified low tone in a stressed syllable and (b) when preceding pause.

(10) Unmodified Low Tone

$$\begin{bmatrix}\text{-High}\\ \text{-Mod}\end{bmatrix} \dashrightarrow \begin{bmatrix}\text{+Mid}\end{bmatrix} \;/\; \underline{\quad} \begin{bmatrix}\text{-High}\\ \text{-Mod}\end{bmatrix}_{o}^{n} \begin{Bmatrix}\begin{bmatrix}\text{-High}\\ \text{+Mod}\\ \text{+Stress}\end{bmatrix}\\ //\end{Bmatrix}$$

In a series of unmodified low tones each successive tone is lower than the preceding one. A phrase final low tone may fall to extra low.

I F

LL
ˌˌ

'L'H
ˌiʔi

I C

LL
ˌˌ

L L
k+t+

A modified low tone is phonetically low in a stressed syllable.

(11) Modified Low Tone

$$[-\text{High}] \dashrightarrow [-\text{Mid}] \quad / \quad \begin{bmatrix} \overline{} \\ +\text{Mod} \\ +\text{Stress} \end{bmatrix}$$

LL	'L'H
ɨɨ	ii?i
one	*chicken*

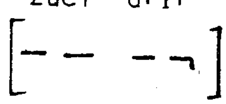
In all contexts not specified in the preceding two rules a low tone is mid. The rules for the variants of low tone can be combined into the one rule (12).

(12) Low Tone

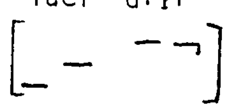
$$[-\text{High}] \dashrightarrow \left\{ \begin{array}{ll} [+\text{Mid}] & / \begin{bmatrix} \overline{} \\ -\text{Mod} \end{bmatrix} \begin{bmatrix} -\text{High} \\ -\text{Mod} \end{bmatrix}_0^n \left\{ \begin{array}{c} \begin{bmatrix} -\text{High} \\ +\text{Mod} \\ +\text{Stress} \end{bmatrix} \\ // \end{array} \right\} \\ [-\text{Mid}] & / \quad \begin{bmatrix} \overline{} \\ +\text{Mod} \\ +\text{Stress} \end{bmatrix} \\ \begin{bmatrix} +\text{High} \\ +\text{Mid} \end{bmatrix} & \end{array} \right\}$$

Contexts in which low becomes mid for example are:

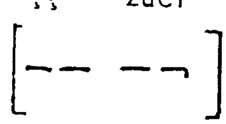
VI E L L H'H
žuči d+?+



VI E 'L L H'H
luči d+?+



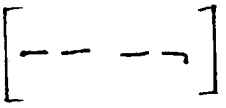
I F LL L'L
ɨɨ žuči



The phonetic rules sometimes have the effect of neutralizing the contrast between high and low. In some of those contexts in which a low becomes mid, a high is lowered to the same pitch level either by being downstepped itself or being preceded by a downstepped tone.

Compare the second tone of $\overset{L\ L}{\check{z}\bar{u}\check{c}i}$ in VI E with the second tone of $\overset{L\ H}{tatn\c{a}}$ in V E. The unmodified low tone and the unmodified high tone are on the same pitch.

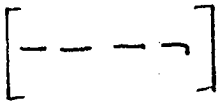
VI E L L H'H
žuči d+?+



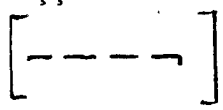
V E L H H'H
tatnạ d+?+

Compare the second tone of $\overset{L'L}{dito}$ in I D with the second tone of $\overset{L'H}{d\dot{+}?+}$ in I E. The modified low tone and the modified high tone are on the same pitch.

I D LL L'L
ṭṭ dito



I E LL L'H
ṭṭ d+?+



4. Table II is an adaptation of the chart of bisyllabic morphemes which appears in P & O. I have rearranged rows and columns from what they were in P & O in order to facilitate comparison between the two analyses. I have also changed the segmental and tonal notations to conform to my own and have united with a ligature each sequence of two tones related to a single underlying vowel. Where the phonetic data I elicited differs from P & O's, I include in parentheses the differences as they might interpret them, although these differences are not crucial to either analysis. Table I is reproduced along with Table II.

DIUXI MIXTEC TONE

TABLE I SEQUENCES OF BISYLLABIC MORPHEMES

I	II	-A III	IV	V	+A VI	VII		
LL	'L L	L'H	H'H	H'H	'L L	L L		
++	diko	ba?a	uu	koo	ǐučǐ	ka?nu		
one	*is sold*	*good*	*two*	*four*	*small*	*large*		
		'L'H (ǐǐ?ǐ) *rooster*		L'H (d+?+) *wife*	L'L (žučǐ) *knife*	H L (čuju) *fly*		
LL HL	'LL HL	LH LL ('LH)	HH LL	H'H HL~ HH 'HL	'LL HL~ 'LL'HL	LL HL~ LL'HL (HL)	H L čaka *fish*	A
LL 'LL	'LL HH	LH 'LL ('LH)	HH HL	HH HL (LH)	'LL HL (LL)	LL 'LL (HL)	'L L ǐelu *hat*	B
LL LL	'LL HH	LH LL ('LH)	HH HL	HH HL (LH)	'LL 'HL (LL)	LL 'LL (HL)	L L k+t+ *animal*	C
LL L'L	'LL HH	LH L'L ('LH)	HH H'L	HH H'L (LH)	'LL 'H'L (LL)	LL 'LL (HL)	L'L L'L žučǐ/ dito *knife uncle*	D
LL L'H	'LL H'H	LH L'H ('LH)	HH L'H	HH 'H'H (LH)	'LL H'H (LL)	LL 'L'H (HL)	L 'H L'H tatna/ d+?+ *medicine wife*	E
LL'L'H	'LL H'H	LH 'L'H ('LH)	HH 'H'H	HH 'H'H (LH)	'LL 'H'H (LL)	LL 'L'H (HL)	'L'H 'L'H ǐǐ?ǐ/ kuči *rooster pig*	F

TABLE II SEQUENCES OF BISYLLABIC MORPHEMES

(adapted from Pike and Oram)

I	II	III	IV	V	VI	VII			
LL	L H	H'H	H'H	H'H	L L	H H			
++	diko	ba?a	uu	koo	ǐučǐ	ka?nu			
one	*is sold*	*good*	*two*	*four*	*small*	*large*			
HH HL	LL HL	H'H LL (H H)	H'H LL (H H)	H'H HL	LL HL	LL HL	H L čaka	*fish*	A
HH LH	LL HH	H'H LH (H H)	H'H HL (H H)	H'H HL (H H)	LL HL	LL LH	L H ǐelu	*hat*	B
HH HH	LL HH	H'H LL (H H)	H'H HL (H H)	H'H HL (H H)	LH H͡LL	LL LH	H H k+t+	*animal*	C
HH H'H	LL HH	H'H L'L (H H)	H'H HL (H H H'L)	H'H HL (H H H'L)	LH H͡L'L	LL LH	H'H žučǐ	*knife*	D
HH H'H	LL H'H	H'H L'L (H H)	H'H L'L (H H)	H'H H͡L'H (H H)	LL H'H	LL L'H	H 'H tatna	*medicine*	E
HH L'H	LL H'H	H'H L'H (H H)	H'H H͡L'H (H H)	H'H H͡L'H (H H)	LL H͡L'H	LL L'H	L'H ǐǐ?ǐ	*rooster*	F

In making comparisons one is struck with how radically different tone assignment is in the two systems. For example, a sequence of four low tones in the new analysis is considered a sequence of four high tones in P & O (I C). In the new analysis a low tone is either a level tone or a falling tone, but in P & O a high tone has these characteristics (their falling tone being called allophonic downdrift). P & O state, "A sequence of high tones has allophonic downdrift when the sequence ends with a non-stressed high... A sequence of high tones does not have allophonic downdrift, however, (1) when the final syllable has a stressed high tone..., and (2) when following a sequence of low tones... (There is downdrift, however, when following a single low tone...)" (pp 324-325)

Some of the differences between P & O and the new analysis arise from my allowing for the neutralization of the contrast between low and high in some contexts and doing this by phonetic rules. For example, in the new analysis a sequence of level tones with a glide on the final tone may be LL L'H or LL L'L, whereas in P & O such a sequence is always HH H'H (I D, E).

Some other differences in the two analyses arise from differences in the phonetic data. In my data no word-final tone modification occurs on the frame morphemes in III-V with the exception of V-A. It is possible that free variation between modified and unmodified tones accounts for the differences in transcription. Should the transcription of P & O be adopted there is no need for my rule 3.

A further difference in the phonetic data is that I have tone modification on a final low-tone syllable in IV D and V D. I am convinced that modification does occur here. It could be included in P & O with a possible increase in generality in their system.

In the remainder of this paper I will compare the two morphophonemic systems and bring in phonetic differences only where they are relevant.

In the new analysis the tones of the frame morphemes undergo no change apart from the differences in modification already mentioned. In P & O there are additional changes in four of the seven columns.

In column I of P & O, the pattern LL becomes HH, whereas in the new analysis the difference is a phonetic one in that a high tone is downstepped to the level of a preceding low tone.

In column II of P & O, the frame LH becomes LL whereas in the new analysis the tones are phonemically the same. It appears that the phonemic difference in P & O is necessary because of their definition of the phonetic alternates of high and low. In isolation their tones are LH and not LL since a final high contrasts with low in this environment; before a high tone their tones are LL and not LH since the second tone is lower than the next high tone. P & O state that the second tone of LL varies between low and raised low. In my data it is always mid.

In column VI of P & O, the pattern LL becomes LH in VI C,D. I recorded no phonetic difference.

In column VII of P & O, the pattern HH becomes LL (VII) whereas in the new analysis it is always LL. Notice that basic HH becomes LL in VII but basic LL becomes HH in I. In the new analysis there is no morphophonemic alternation in the tones of the frame morpheme in either case, but there is a difference in the phonetic variants of the tones.

In comparing the two analyses in respect to substitution items, I will consider each column separately as P & O do in giving their generalizations about tone sandhi.

In column I, each of the morphemes appears with its basic tones. In P & O, two patterns are tonally the same and arbitrarily differentiated on the basis of the changes they undergo in sandhi (I D, E), whereas in the new analysis the two tone patterns are phonemically distinct. The contrast between the two patterns is neutralized by the phonetic rules.

In column II of P & O, a morpheme initial low tone becomes high tone and tone modification on the second high tone of II D is lost. This loss of tone modification has no explanation in P & O. In the new analysis, however, it is completely regular. The tone which loses its modification is a derived high tone, and like any other derived high tone in II, is unmodified.

For column III, P & O list the changes of HL to LL, HH to LL, and H'H to L'L. The generalization which could have been made is that a high tone or a sequence of high tones becomes low tone(s). The generalization made in the new analysis is that a morpheme initial high tone becomes a low tone (III A); other differences are allophonic.

For column IV, P & O state that none of the nouns retain their basic form, and then they give a list of the tone changes: HL to LL, LH to HL, HH to HL, H'H to HL, H'H to L'L and L'H to HL'H. Three patterns become HL, but there is no explanation as to why LH, HH and one H'H all yield this particular pattern, but another H'H yields the pattern L'L. In the new analysis the first three patterns all involve a low tone becoming a high tone with one instance of tone modification loss (IV B). The fourth pattern has no change from the underlying tones, although by raising the low to high and returning it to low there is a slight increase in generality (rules 5 and 6). It is necessary for P & O to introduce a tone glide in the derived form of L'H. This pattern becomes HL'H, whereas in the new analysis a low simply becomes a high as in the other patterns. Notice that in P & O the first tone, the second tone or both tones undergo change, whereas in the new analysis only the first tone undergoes change.

In column V of P & O, three patterns become HL (V B-D) and two become HL'H (V E,F). There is no explanation as to why the tone patterns group in this way rather than in some other way. In the new analysis a low tone is changed to a high tone in every case (V B-F); modification is lost before a low tone in (V B) and modification is added before a high tone in (V E).

In column VI, the contrast between the two systems is essentially the same as in column V.

In column VII of P & O, an initial high tone becomes a low tone in all but VII, and tone modification is lost on one H'H pattern (VII D) but not on the other H'H pattern (VII E). In the new analysis every initial low tone becomes modified. The loss of modification on the second syllable of VII D is conditioned by the modified low tone on the preceding syllable.

FOOTNOTES

[1] I am indebted to Joy Oram and Albertha Kuiper for obtaining native speakers of Diuxi Mixtec so I could check out details of the reanalysis and collect additional tone data.

My study of a closely related language, Peñoles Mixtec, has contributed important insights into the tone system of Diuxi Mixtec , which shows both interesting similarities and dissimilarities to the tone system of Peñoles Mixtec.

For a description of the Peñoles Mixtec tone system which is more comprehensive than the one given here for Diuxi Mixtec, see Daly 1977.

[2] Tone Modification comes from Nancy Woo (1969) and is used in my description of Peñoles Mixtec tone. In conjunction with low tone, modification in a stressed syllable is manifested as a level tone in both languages, but in conjunction with high tone it is manifested as downward glide at the end of a level tone in Diuxi Mixtec and as a rising tone in Peñoles Mixtec.

[3] In this paper I will confine my attention to sequences of two bisyllabic morphemes and omit discussion of monosyllabic morphemes described by P & O, inasmuch as sequences of two bisyllabic morphemes manifest the essential features of the tone system. I have collected data on sequences of three or more morphemes, not mentioned by P & O, which indicate that the perturbing power of a derived pattern sometimes corresponds to the underlying tones and sometimes to the derived tones.

[4] The basic pattern H'H is not represented among the morphemes occurring in second position since no noun has been found to have this tone pattern. In other contexts I have been able to determine that there are basic H'H patterns, such as in the numeral four, but have yet to find frames which would give the patterns derived from H'H after each of the classes represented in I-VII.

REFERENCES

Daly, John P. 1977. A Problem in Tone Analysis. Studies in Otomanguean Phonology, ed. by William R. Merrifield, 3-20. SIL Publications in Linguistics 54. Summer Institute of Linguistics and the University of Texas at Arlington.

Pike, Eunice V. and Joy Oram. 1976. Stress and Tone in the Phonology of Diuxi Mixtec. Phonetica 33:321-333.

Woo, Nancy 1969. Prosody and Phonology. Unpublished doctoral dissertation. Massachusetts Institute of Technology.