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Comaltepec Chinantec Tonology

Classification: Chinantecan, Otomanguean, spoken in Oaxaca, Mexico.

Morphology: predominantly monosyllabic roots, rich inflectional system consisting of subsyllabic tone, length, nasality, ablaut, consonantism, phonation, tone augmentation.

Verb Class

Paradigm Number	first singular	first plural	second person	third person
Progressive				
Intentive				
Completive				

L = Low tone, M = Mid tone, H = High tone,
' = Ballisticity, : = Length, ? = Glottal checking

Class A

P1	1s	1p	2	3
P	H	H	L	HL
I	MH	H'	H'	M'
C	M'	H'		HL

P2	1s	1p	2	3
P	L:'	H:	L:	L:
I	LH:'	H	H:'	M'
C	M'	H'		L:'

P3	1s	1p	2	3
P	M'?	M'?	L'?	L'?
I	H'?	H'?	H?	L'?
C	M'?	H'?		L'?

P4	1s	1p	2	3
P	M'?	M'?	HL?	HL?
I	H'?	H'?	H?	M'?
C	M'?	H'?		HL?

Class B

P5	1s	1p	2	3
P	L'	L'	L'	L'
I	H'	H'	H'	L'
C	L	H'		L'

P5	1s	1p	2	3
P	M:'	M:'	M:'	M:'
I	H'	H'	H'	M:'
C	M:'	M:'		M:'

P7	1s	1p	2	3
P	HL'	HL'	HL'	HL'
I	LH'	LH'	LH'	LH'
C	M'	LH:'		HL'

Class C

P8	1s	1p	2	3
P	H:	H:	H:	L:'
I	H:	H:	H:	M'
C	H:	H:		L:'

P9	1s	1p	2	3
P	LH:'	LH:'	LH:'	HL:'
I	LH:'	LH:'	LH:'	M'
C	LH;'	LH:'		HL'

P10	1s	1p	2	3	P11	1s	1p	2	3
P	LH?	LH?	LH?	HL?	P	HL'?	HL'?	HL'?	HL'?
I	LH?	LH?	LH?	H?	I	HL'?	HL'?	HL'?	HL'?
C	LH?	LH?	LH?	HL?	C	HL'?	HL'?	HL'?	HL'?

Anderson (1989): "The internal inflection of Comaltepec active verb stems is complex to the point of frustrating any attempt to isolate individual morphemes which mark categories of aspect or person-of-subject. A combination of tone, ballistic stress, and segmental changes define these categories in a three-by-four, twelve place matrix (p.5)...Comaltepec verb stens participate in a large number of such paradigms which...may differ phonologically from one another by tone, length, palatalization, vowel, nasalization, stress [ballisticity --D.S.], or glottal closure, in a bewildering variety of patterns"(p.6).

Segments, Syllable Structure, Phonotactics:

p	t	c		k		ii		u
b	d	z		g		ee		o
	s		r			æ		a
m	n			ŋ				
	l							
	N	y		w				

h, ?

(c = tS, z = dZ, r =z/)

lexical surface tonal inventory:　　　　L, M, H, LM, LH, HLH

syllable shape: C(G)V(:)(N)(?)

onsets: Any consonantal segment, as well as the glides /w/, /y/, and the laryngeals /?/, /h/, may occupy onset position.

The sonorants, as well as /g/, may additionally possess a contrastive laryngeal specification involving [spread] or [constricted]. This additional laryngeal feature is phonetically implemented *preceding* its accompanying supralaryngeal constriction.
The glides /y/, /w/ may form onset clusters with any consonant except /r/ or the labials. The glides pattern with the sonorant consonants in allowing laryngeal augmentation ([?w,hw,?y,hy]).

onset /y/ is not contrastive in syllables with nuclear /i/ (*/yi/). Similarly, onset /w/ is not contrastive in syllables with nuclear /u/ (*/wu/). Additionally, /w/ does not cluster   with   /ŋ/ (*/ŋw/).

codas: Coda consonants in morphologiclly simplex environments are limited to /N/, /?/, and /N?/. In morphologically complex environments, the coda system is somewhat more

liberal, allowing /r/ (a reduced form of the third person pronoun), and /b/ (the copula).

Environments of Tone Sandhi

a. a preceding post-tonic syllable

ki:h^L	->	ni^{L}lah^H ki:h^{HL}	(I will buy candles)
li^{LH}	->	huih^{LM}R li^{HM}	(I chew palm shoots)
ge:h^M	->	ka^{L}kian?^{M}R ge:h^H	(I slept yesterday)
ku:^{M}	->	ka^{L}mih^{M}R ku:^{HM}	(I asked for money)

b. a preceding controlled syllable with [M]

re:^{L}	->	so:^{M}re:^{HL}	(smooth ascent)
hna^{LH}	->	mi^M hna^{HM}	(I ask for it)
kiah?^{M}r	->	mi:^{M} kiah?^{H}r	(I asked for his)
ziu:^{M}	->	mi^M ziu:^{HM}	(I asked for the jar)

c. a preceding syllable with tone /H/ that is not both short and ballistic

?iehn^L	->	hiu:n^{LH} ?iehn^{HL}	(pretty child)
?nga^{LH}	->	he:h^{LH} ?nga^{MH}	(in the forest)
boh^M	->	hmi^{LH} boh^H	(fat skunk)
ziu:^{M}	->	gua^{LH} ziu:^{HM}	(jar's handle)

d. A preceding syllable with tone [MH] or [HM] that is not both short and ballistic

hia:n^L	->	?me^{L}he?^{MH} hia:n^{HL}	(cheap basket)
be?^{LH}	->	?ma^L?u^{MH} be?^{MH}	(short cane)
teh^M	->	hmi^L?o:^{HM} teh^H	(sticky soot)
?ui:n^M	->	ka^{L}lu:h^{HM} ?ui:n^{HM}	(outside Ojitlan)

Pace (1990): "Comaltepec tone sandhi operates across word boundaries as well as within words. It is impeded only by a pause or by a syllable having a tone pattern which does not participate in sandhi"(p.26).

phonetic tonal inventory

Tone / Rime	VV		V:V	:	V?V	?	V:?V	:?
L	x	x	x	x	x	x	x	x
M	x	x	x	x	(x)	x	x	x
H		x		x	x	x		x
LM	x	x			x	x		
LH	x	(x)			x			
HLH				x				x
MH	x	x			x			
HM			x				x	
HMH				x				x
HL	x	x	x	x	x	x	x	x

The Phonetic Tonal Structure of Sandhi Triggers

Tone / Rime	VV		V:V	:	V?V	?	V:?V	:?
L	x	x	x	x	x	x	x	x
M	**x**	x	**x**	x		x	x	x
H		x		x	x	x		x
LM	x	x			x	x		
LH	**x**	x			**x**			
HLH				**x**				x
MH	**x**	x			**x**			
HM			**x**				x	
HMH				**x**				x
HL	x	x	x	x	x	x	x	x

The Phonetic Tonal Structure of Sandhi Targets

Tone / Rime	VV		V:V	:	V?V	?	V:?V	:?
L	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
M		**x**	**x**	**x**		**x**	**x**	**x**
H		x		x	x	x		x
LM	x	x			x	x		
LH	**x**	**x**			**x**			
HLH				**x**				**x**
MH	x	x			x			
HM			x				x	
HMH				x				x
HL	x	x	x	x	x	x	x	x

The Phonetic Tonal Structure of Sandhi Outputs

Rime →	VV		V:V	:	V?V	?	V:?V	:?
Tone ↓								
L	HL	HL	HL	HL	HL	HL	HL	HL
M		H	HM	H		H	HM	H
H								
LM								
LH	MH	MH			MH			
HLH				HMH				HMH
MH								
HM								
HMH								
HL								

The Phonological Tonal Inventory:

Rime →	VV		V:V	:	V?V	?
Tone ↓						
L	x	x	x	x	x	x
_		M		M		M
H	M	x	M	x	x	x
HL	LM	LM			LM	LM
LH	x	(x)		HLH	x	

(a) L may associate with any syllable type
(b) Controlled syllables must bear underlying tones
(c) H may associate with any syllable type
(d) HL may not occur on long syllables
(e) long controlled syllables may not bear contour tones

Rime →	VV		V:V	:	V?V	?
Tone ↓						
L	x	x	x	x	x	x
_	**b**	M	**b**	M	**b**	x
H	M	x	M	x	x	x
HL	LM	LM	**d**	**d**	LM	LM
LH	x	x	**e**	HLH	x	

Thus the only reamining gap in root types is V ?^{LH}.

Sandhi Triggers

Rime → Tone ↓	VV		V:V	:	V?V	?	
L	x	x	x	x	x	x	
_		M		M		M	
H		x	**M**	x	x	x	underlying syllabary
HL	LM	LM			LM	LM	
LH	**x**	(x)		**HLH**	**x**		

	VV		V:V	:	V?V	?	
MH	**x**	x		**HMH**	**x**		
HM			**x**				derived syllables
HL	x	x	x	x	x	x	

trigger summary

Rime → Tone ↓	VV		V:V	:	V?V	?
L	x	x	x	x	x	x
_		M		M		M
H		x	**M**	x	x	x
HL	LM	LM			LM	LM
LH	**x**	(x)		**HLH**	**x**	

Characterization:
1. LH syllables spread H
2. Syllables possessing post-vocalic laryngeal features don't spread H
3. Spread H

Questions: Why are all LH contours triggers, while level H tones are not?
Why do tautosyllabic post-vocalic laryngeal features block Sandhi, while heterosyllabic post-vocalic laryngeal features do not?

Sandhi Targets

Rime → Tone ↓	VV		V:V	:	V?V	?
L	**x**	**x**	**x**	**x**	**x**	**x**
_		**M**		**M**		**M**
H	**M**	**x**	**M**	**x**	**x**	**x**
HL	**LM**	**LM**			**LM**	**LM**
LH	**x**	**x**		**HLH**	**x**	

Sandhi outputs

Rime →	VV		V:V	:	V?V	?
Tone ↓						
L	HL	HL	HL	HL	HL	HL
_		H		H		H
H	HM	H	HM	H	H	H
HL	LM	LM			LM	LM
LH	MH	MH		HMH	MH	

Excursus on Zulu
"a high toneme is displaced by a depressor to the following syllable...whether this syllable is high-toned or low-toned, unless this syllable also has a depressor..."(p.115). Depressor consonants are those which involve both voicing and breathiness, including voiced aspirated plosives, voiced fricatives (in which breathiness [aspiration] is redundant), and breathy sonorants (in which voicing is redundant)(Trail 1987).

Vowel length is both phonemic and derived in Zulu. Derived long syllables result from both morpheme concatenation, and from an automatic process of penultimate lengthening.

(f)   sources of long Zulu vowels:
       lexical   morphologically derived   penultimate lengthening
       /V:/ -> [V:]   /V+V/ -> [V:]   /VCV#/ -> [V:CV]

       a.   "A high toneme is displaced by a depressor to the following syllable."

             ìsíhlàlò (chair) ->   ìẕìhlálò - ìẕìhlálò   (chairs)
       but   ìsígqòkò   (hat)   ->   ìzígqòkò   (hats)
             í'nqólà (wagon)   ->   ngènqólà   (by means of a
                                                              wagon)
       but   íngánè (child) ->   ngé'ngánè   (by means of
                                                        a
                                            child)
             índúnà (headman)   ->   éndùnénì   (to a
                                           headman)
       but   ímbúz   (goat)   ->   é"mbúzìnì   (to a goat)

       b.   Depressors do not displace tones from a long vowel.

             zìkhônà   (they are present)
       but   zí:khònà   (they being present)

       H tones flanked by depressor consonants do not undergo displacement.

If the second syllable is H-toned. tone displacement is vacuous.

When the following syllable is long and low toned, a falling contour surfaces here.

Now, in long syllables with depressor onsets, depressor-induced pitch lowering occupies all or part of the first mora. The second, tautosyllabic mora may accommodate the   lexical H tone; no syllabic reaffiliation of this tone is required.

in both Zulu and Chinanatec, intervening laryngeal features may block tone spread

In Zulu, heterosyllabic depressors act as blockers.

In Chinantec, tautosyllabic rightward laryngeal features block H spread if the trigger is level H

while Zulu limits tone displacement to only those environments in which H tones would otherwise be non-salient, Chinantec seems to have generalized its spreading process somewhat: all LH tones spread their H component, regardless of intervening laryngeal features, while plain H tones spread, but only when no tautosyllabic laryngeal feature intervenes.

(t)		Chinantec	Zulu
	process:	tone spread	tone displacement
	triggers:	all LH,	phonetic LH in short syllables
		level H, if no post-vocalic	
		laryngeal features	
	blockers:	tautosyllabic, post-vocalic	heterosyllabic depressors -- voiced
		laryngeal features in level H aspirates	