SUMMARY OF COMALTEPEC CHINANTEC MORPHO-PHONOLOGY

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INTRODUCTION

Readers of the present volume are, by now, fully aware of one its major foci: the remarkable richness and bewildering complexity of inflectional morphological systems in the languages of the Meso-American region. The emphasis of the paper you are now reading is on one of the most complex of any of these systems, that of Comaltepec Chinantec (henceforth Comaltepec). The data considered herein were originally gathered, compiled, and analyzed by Judi Lynne Anderson and Wanda Jane Pace over a number of decades. The fruits of these scholars' remarkable labor, alas, have been rather poorly disseminated: one slim (and increasingly hard-to-find) volume on Comaltepec syntax (Anderson 1989), and two brief (if remarkably data-rich) papers appearing in a volume of comparable obscurity (Anderson, Martinez, and Pace 1990, Pace 1990). Several works by the present author have appeared in subsequent years that are more theory-driven than data-driven, placing emphasis on extracting deep phonological patterns, rather than on presenting the data from a descriptive perspective. Inevitably, of course, as "deeper" patterns are unearthed, the resulting characterization of the data themselves becomes increasingly removed from "shallower"—phonetic—details. I leave it to individual readers to decide at which level they prefer to caste their eye. But for now, suffice to say, I herein provide a summary of the patterns from this "deep" phonological perspective, patterns that I have extracted over years of analysis from the remarkable scholarship of my predecessors. Several of these analyses have been published previously in books and/or papers (Silverman 1994, 1995, 1997ab, 2003, 2005, 2006), but others appear in published form for the first time here.

1. BACKGROUND

Chinantecan is a group of about fourteen VSO languages within the Otomanguean family spoken by approximately 90,000 people in northeastern Oaxaca, Mexico. Chinantecan branched from the Otomanguean tree over sixteen centuries ago (Rensch 1968). Comaltepec, spoken in the southern region of "La Chinantla", in the village of Comaltepec in Oaxaca, is perhaps the most conservative of the extant Chinantecan languages. It is spoken by approximately 1400 people.

2. THE SOUND INVENTORY

The Comaltepec inventory of contrastive oral values is rather standard in terms of both its phonetic properties and its size: the vowel space is occupied by eight qualities, and the consonant inventory contains up to twenty members. As can be seen in (1), however, the system also possesses laryngeal contrasts in the form of glottal aperture (phonation), and rate of vocal fold vibration (tone).

(1) Oral:

Consonantism:

p	**t**	**tʃ**		**k**
ᵐb	**ⁿd**	**ⁿdʒ**		**ᵑg**
	s			
		z̨		
m	**n**		**ŋ**	
	l			
		j	**w**	

Vocalism:

i	**ɨ**	**u**
e	**ʌ**	**o**
æ		**ɑ**

V:
Ṽ

Laryngeal:

Tone:

˩	˧	˥	˩˥	˥˩
(L	**M**	**H**	**LM**	**LH)**
˥˧	˧˥			˧˩
(HL	**HM**			**MH)**

Aperture:

h **ʔ**

Examples of pre-vocalic consonants, pre-vocalic laryngeals, their combinatory possibilities (mostly limited to laryngeals with sonorants), and also examples of both lexical and derived tones, are provided in (2).

(2)

pre-vocalic consonants:		vowels:		prevocalic laryngeals:		tones:	
pihʔ˥	little (i)	**hi˩**	book	**hi˩**	book	**hi˩**	book
ᵐbʌʔʌ	ball	**heʔʌ**	frog	**ʔoː˧**	papaya	**dʒœː˧**	earthen jar
mĩːh˥	plain	**tɑʌ**	work	**n̪͡miː˩**	feces	**l̥loʔ˥**	pretty
tɑʌ	work	**ʔoː˧**	papaya	**n̪͡m˩**	water	**ᵑgiŋʔʌ**	swing
ⁿdoːhʌ	maguey sap shoot	**lu˩**	fly	**n̪͡niːhʌ**	rope	**liʌ**	tepejilote palm
so˧	ascent	**lihʔ˥**	circle	**ŋ̪͡nʲuː˩**	green beans	**hi˩mmiˬ**	onion (alternant of ˩)
nũː˩	grass (alternant of ˧)	**bʌʔʌ**	short	**ŋ̪͡ŋʲoŋʔʌ**	waist	**zi˩moːhˬ**	flea

loːꜘ	rabbit	**dʒæꜘ**	person	**ŋ͡ŋanʌʔn̥ꜘ**	he kills	**teꜘgwɑꜗ**	earrings
(alternant of **ʌ**)							
tʃ̃ihꜗ	term of endearment			**ʃ̻̊eːꜘ**	dust		
ⁿdʒiːꜘ	dog			**ʃ̻̊oʔꜗ**	pretty		
jʌʔ꜖	above			**ʃ̻̊jeꜘ**	sun		
zo̤ːꜘ	sweet			**ʃ̻̊je꜖**	where		
kiʌ	garbage			**ʂ̻̊wihʔ꜖**	black (i)		
ᵑguːhʌ	owl			**ʂ̻̊wɨːhꜘ**	village		
ŋ̃ũhʌ	meat						
wɨ꜖	spider						

Regarding elements found post-vocalically, these are limited to a nasal that does not possess contrastive oral postures. This nasal assimilates to following consonants, though in their absence the post-vocalic nasal is implemented as a velar. The nasal may co-occur with voicelessness and/or a following glottal stop. Simple laryngeals (singly or in a sequence of **hʔ**) may also close the syllable, and there are a few additional morphologically complex values here. Some examples are provided in (3).

(3)

post-vocalic nasals:		post-vocalic laryngeals:		morphologically complex codas:			
hwɨŋʌ	any	**tɑʔʌ**	honey	**ʔjɑʂꜘ**	(**ʔjɑhꜘ+ʂ**)	her griddle
gjuŋꜗ	good (a)	**ᵑguːhʌ**	owl	**sɨ̃ʔʂꜗ**	(**sɨ̃ʔꜗ+ʂ**)	his clothing
...kʌŋʔ꜖	big	**huhʔꜗ**	pineapple	**hipꜘ**	(**hiꜘ+p**)	it's a book
gɨŋʔʌ	swing			**pihʔpꜗ**	(**pihʔꜗ+p**)	it's little

3. INFLECTIONAL MORPHOLOGY

As may be surmised from the examples considered thus far, Comaltepec roots and words are usually monosyllabic. Moreover, due to inherent inflection in the verbal system, a single syllable may contain not only the root, but also active/stative markers, gender markers (animate/inanimate), transitivity markers (intransitive / transitive / ditransitive) aspect (progressive / intentive / completive), and possibly subject pronoun clitics (two subsyllabic classes). This results in monosyllabic verbal complexes that bear a particularly high informational load.

Comaltepec—particularly its verbal system—thus seems to have painted itself into a corner: (1) it has a fairly simple and straightforward inventory of contrastive oral configurations, (2) it has a rather simple syllable structure, (3) its words are typically only a single syllable in length, but (4) it has an extremely rich inflectional morphological system. The problem is this: where does Comaltepec put it? That is, how does the language succeed in phonetically encoding all its morphological content within the confines of a single, comparatively simply-structured syllable?

As schematized in (4), the remarkable solution that linguistic evolution has provided Comaltepec is one in which the rich inflectional system normally involves laryngeal modification of root

vocalism. Its eight vowel qualities may be combined with five contrastive tonal qualities, a binary length contrast, and two voice qualities (**V Vh**; as discussed in Silverman 1994, 1995, and 1997a, post-vocalic aspiration may be regarded as affiliated with the vowel; see also Section Five of the present paper). A binary nasality contrast in its vocalism is also present. The cross-classification of these five independent systems results in 320 possible nucleus qualities (8 x 5 x 2 x 2 x 2). A single vowel quality may thus possess up to forty contrastive values. These hundreds of values are, by and large, deployed as the inflectional morphological markers.

(4) Primary syllabic location of Comaltepec verbal morphological components

	Prevocalic consonantism:	Vocalism:	Postvocalic consonantism:
supralaryngeal:	root	root	root
laryngeal:	root	inflection	root

It is exactly the vocalism—as opposed to the consonantism—of root syllables that is especially adept at accommodating many morphological distinctions, because it is vocalism—again, as opposed to consonantism—that possesses sufficient acoustic energy to saliently accommodate the many *phonetic* distinctions required to encode the many *semantic* (morphological) distinctions (Silverman 1995, 1997a).

So, what are these morphological distinctions found within the confines of the Comaltepec monosyllabic verbal complex? As characterized in Anderson 1989, Anderson, Martinez, and Pace 1990, and Pace 1990, Comaltepec actually possesses a large number of verb classes, along with many lexical exceptions. Classes are differentiated by patterns of identity or non-identity across aspect/person combinations, again, as typically encoded in the laryngeal quality of the vowel. As exemplified in (5), the partial paradigm for the verb “to hit” in Comaltepec (Anderson 1989) possesses some complexes that are identical to others, while others are different, primarily within the domain of its vocalic/laryngeal systems.

(5)	hit (transitive/inanimate)	1s	1p	2	3
	progressive	bah˩	ba˩	bah˩	bah˩
	intentive	bah˥	bah˥	bah˥	bah˩
	completive	bah˩	bah˥	bah˧	bah˩
	hit (transitive/animate)				
	progressive	bʌ:ŋ˦	bʌ:ŋ˦	bʌ:ŋ˦	bʌ:ŋ˦
	intentive	bʌ:ŋ˥	bʌ:ŋ˥	bʌ:ŋ˥	bʌ:ŋ˦
	completive	bʌ:ŋ˦	bʌ:ŋ˥	bʌ:ŋ˧	bʌ:ŋ˦

As schematized in (6), main verb classes are differentiated by patterns of identity or non-identity across aspect/person combinations. Cell "2C" displays the most variation from verb to verb, and thus does not pattern as regularly (P = progressive aspect, I = intentive aspect, C = completive aspect):

(6)

Class A

P1	1s	1p	2	3
P	˦	˦	˩	˧
I	˥	˥h	˥h	˦h
C	˦h	˥h		˧

P2	1s	1p	2	3
P	˩:h	˦:	˩:	˩:h
I	˧:h	˥h	˥:h	˦h
C	˦h	˥h		˩:h

P3	1s	1p	2	3
P	˦h?	˦h?	˩h?	˩h?
I	˥h?	˥h?	˥?	˩h?
C	˦h?	˥h?		˩h?

P4	1s	1p	2	3
P	˦h?	˦h?	˧?	˧?
I	˥h?	˥h?	˥?	˦h?
C	˦h?	˥h?		˧?

Class B

P5	1s	1p	2	3
P	˩h	˩h	˩h	˩h
I	˥h	˥h	˥h	˩h
C	˥h	˥h		˩h

P6	1s	1p	2	3
P	˦:h	˦:h	˦:h	˦:h
I	˥h	˥h	˥h	˦:h
C	˦:h	˦:h		˦:h

P7	1s	1p	2	3
P	˧h	˧h	˧h	˧h
I	˧h	˧h	˧h	˦h
C	˦h	˧:h		˧h

Class C

P8	1s	1p	2	3
P	˧ː	˧ː	˧ː	˩hː
I	˧ː	˥ː	˧ː	˧h
C	˧ː	˧ː		˩hː

P9	1s	1p	2	3
P	˄ːh	˄ːh	˄ːh	˄h
I	˄ːh	˄ːh	˄ːh	˧h
C	˄ːh	˄ːh		˄h

P10	1s	1p	2	3
P	˄ʔ	˄ʔ	˄ʔ	˄ʔ
I	˄ʔ	˄ʔ	˄ʔ	˧ʔ
C	˄ʔ	˄ʔ	˄ʔ	˄ʔ

P11	1s	1p	2	3
P	˄hʔ	˄hʔ	˄hʔ	˄hʔ
I	˄hʔ	˄hʔ	˄hʔ	˄hʔ
C	˄hʔ	˄hʔ	˄hʔ	˄hʔ

4. TONE SANDHI

The extremely rich pattern of inflectional morphology possessed by Comaltepec is rendered far more phonologically complex due to a pervasive process of tonal alternation, or tone sandhi.

4a.Type One Sandhi

The basic pattern of tone sandhi consists of rightward high spread when this high is tautosyllabic with a preceding lower pitch. That is, the **LH** tone pattern spreads its **H** component rightward. The basic patterns of tone sandhi are tabularly displayed in (7), though the pattern is ultimately far more complex than this.

(7) Key to tone sandhi:

input values	**changed values**	**sandhi triggers**	**neutralized values**	**(vacuous sandhi)**	**derived only**	**- loanwords only -**

Tone sandhi:

rime→ tone↓	**V**	**Vh**	**Vː**	**Vːh**	**Vʔ**	**Vhʔ**
˩	˥	˥	˥	˥	˥	˥
˧	˧	˥˩	˥	˥˩	˧	˥˩
˥˩		(˥˩)		(˥˩)	(˥˩)	(˥˩)
˄	- ˄ -	- ˄ -			- ˄ -	- ˄ -
˅	˥̄	˥̄		˥̄	˥̄	

Regarding sandhi triggers, as already noted, **LH** tones trigger sandhi, the exception being on to potential **LM** targets, which are exclusively loanwords; these may be analyzed as having not (yet) undergone the full process of nativization, hence their exceptionality. Some examples are presented in (8); notice that the rightward tones on nouns (underlined) are thus derived.

(8)	Non-sandhi context:	Sandhi context:	Gloss:
	-toːL	kwaʌ-toːN	give a banana
	-ŋɨhL	kwaʌ-ŋɨhN	give a chayote
	-kuːH	kwaʌ-kuːN	give money
	-ⁿdʒuːH	kwaʌ-ⁿdʒuːN	give a jug

MH tones also triggers sandhi. Indeed, **MH** is merely **LH** that itself has been subject to sandhi (9).

(9)	Non-sandhi context:	Sandhi context:	Gloss:
	-hiL	sɨʌ-hiN	is it a book
	-toːL	sɨʌ-toːN	is it a banana
	-tũhH	sɨʌ-tũhꟾ	is it two
	-ⁿgeːhH	sɨʌ-ⁿgeːhꟾ	is it twenty
	-kuːH	sɨʌ-kuːN	is it money
	-kjaʔʂꟾ	sɨʌ-kjaʔʂꟾ	is it his
	-ŋɨʌ	sɨʌ-ŋɨʌ	is it salt
	-lohʌ	sɨʌ-lohʌ	is it a cactus

In addition to **LH** and **MH**, the forms in (10) show that both long and short vowels with mid-tones (**M** and **Mː**) trigger sandhi as well, provided the trigger syllable lacks post-vocalic laryngeals.

(10)	Non-sandhi context:	Sandhi context:	Gloss:
	-hiL	mɨːH-hiN	I ask for a book
	-mohʔL	mɨːH-mohʔN	I ask for squash
	-kuːH	mɨːH-kuːN	I ask for money
	-ʔoːH	mɨːH-ʔoːN	I ask for papaya
	-tehH	m̥̀mɨL-ʔõːN-tehꟾ	sticky soot

Finally, **HM** tones also trigger sandhi, as in (11). This is not too surprising, since **HM** is merely **M** that itself has been subject to sandhi.

(11)	Non-sandhi context:	Sandhi context:	Gloss:
	-tehH	m̥̀mɨL-ʔõːN-tehꟾ	sticky soot

Now, regarding the outputs of tone sandhi, these involve tone changes on syllables that follow the sandhi trigger. First, as shown in (12), **L** targets become **HL**.

(12)	Non-sandhi context:	Sandhi context:	Gloss:
	-hi˩˥	**mi˦˦-hi˥˩**	I ask for a book
	-ŋi˦h˩˥	**mi˦˦-ŋi˦h˥˩**	I ask for a chayote

Moreover, (13) shows that **M˦** targets lacking post-vocalic laryngeals become **HM**.

(13)	Non-sandhi context:	Sandhi context:	Gloss:
	-ku˦˦	**kwa˧-ku˦˥**	give money
	-ⁿdʒu˦˦	**kwa˧-ⁿdʒu˦˥**	give a jug

By contrast, (14) shows that **M** targets possessing post-vocalic laryngeals become **H**.

(14)	Non-sandhi context:	Sandhi context:	Gloss:
	-tũh˦	**mi˦˦-tũh˥˧**	I ask for two
	-ᵑge˦h˦	**mi˦˦-ᵑge˦h˥˧**	I ask for twenty
	-ᵑge˦h˦	**kwa˧-ᵑge˦h˥˧**	give twenty
	-kjahʔʂ˦	**kwa˧-kjahʔʂ˥˧**	give his

Finally, as exemplified in (15), all **LH** targets become **MH**.

(15)	Non-sandhi context:	Sandhi context:	Gloss:
	-ŋi˧˥	**mi˦˦-ŋi˥˥**	I ask for salt
	-loh˧˥	**mi˦˦-loh˥˥**	I ask for a cactus

The generalizations that we may extract from this extremely complex pattern are perhaps best summarized in tabular form. Forgoing a detailed investigation into the proposed explanation, in (16) I merely provide a brief tabular outline of the proposals that are discussed in detail in Silverman 1997b and Silverman 2006. The basic idea is that Comaltepec tone sandhi has its origins in natural phonetic processes: pitch rises take longer than pitch falls, and so rises are thus more likely to "spill over" their end-sections on to a following vowel. Over time, if there are few counter-pressures inhibiting its generalization (counter-pressures in the form of inducing listener confusion due to the sandhi pattern deriving excessive homophony), then, indeed, the pattern may generalize to phonetically comparable—though decreasingly phonetically natural—contexts (see also Silverman 2012). As **M(˦)** (without post-vocalic laryngeals) historically derives from **H(˦)**, we may reconstruct an intermediate stage in which these **H(˦)** tones fell in line with the sandhi-triggering pattern, and only subsequently lowered to **M(˦)**, thus leaving the now-"opaque" pattern in its wake; recall, **M(˦)** (without post-vocalic laryngeals) triggers **H** on a rightward vowel.

(16)

Rightward spread of **H** tones from **LH** syllables	Pitch rises take longer than pitch falls; **LH** tones are likely to "spill over" their **H** component
H-insertion following **M:** syllables	**M:** historically derive from **H:**; the sandhi pattern generalized to include all **H**-final syllables that lack post-vocalic laryngeals; then **H:** lowered to **M:**
LM is not a target	**LM** is only found on loanwords, which have not nativized to the extent of undergoing sandhi
Mh is the only neutralizing target (to **Hh**)	Almost all sandhi outputs are allophonic; they enhance tonal distinctions

For now, the most important generalization to make is this: despite its phonetic naturalness, and also despite its clear tendency to have generalized to include less and less phonetically natural contexts, still, Comaltepec tone sandhi is rarely neutralizing, and hence the likelihood of deriving homophonous forms—hence confusion on the part of the listener—is very low indeed.

4b. Type Two Sandhi

An additional tone sandhi pattern is linked to the Comaltepec system of supralaryngeal harmony into the enclitic domain. Comaltepec possesses a series of reduced pronomical clitics that sometimes serve to increase the length and complexity of the stem syllable. Some of these clitic forms induce tone changes on this complex, a pattern termed "Type Two Sandhi" by Anderson, Martinez, and Pace (1990).

The forms—both full and corresponding reduced—are inventoried in (17), (where □ = harmonic element, px = plural exclusive, pi = plural inclusive). The supralaryngeal configuration of the harmonic element itself is fully determined by the preceding supralaryngeal value, be this vocalic and/or nasal. The tone of the harmonic element, is usually **L**, but is subject to tone sandhi under conditions to be discussed momentarily.

(17)

	full forms:	reduced forms:
1s	n̰n͡æʌ	+□
1px	n̰n͡æʔ˥	+nɑʔ,+□ʔ
1pi	hnæːhʌ	+□ʔ
2s	n̰n͡juh˩	+ʔ
2p	n̰n͡iuhʔ˩, nɑhʔ	
3	ʔiʂ	+ʐ́/+ʂ
animal	ʔi˩ʐ́ʌhʔ˧	(…ŋ)+neʔ, □+ʐ́ʌhʔ˧

As exemplified in (18), the "□" suffix copies the preceding supralaryngeal gesture, vowel or nasal. Laryngeal gestures are not copied, and intervening laryngeals are transparent; tone conditionally spreads from the stem.

(18)	nɪ̃˩ʔɪ̃ːʌn̥n̥˩	(nɪ˩ʔɪːn̥ʌ+□)	I will sweat
	ka˩kjãn˧ʔn̥˩	(ka˩kjanʔ+□)	I slept
	m̥͡mɪ̃˩ŋɪ̃˥ʔɪ˥	(m̥͡mɪ̃˩ŋɪ̃ʔ˥+□)	I ask (him)
	ka˩nõ˧hõ˩	(ka˩nõh˧+□)	I got it

As exemplified in (19), in modal, open roots, "□" is incorporated into the stem syllable, lengthening short syllables, and having no effect on long syllables.

(19)	mɪ̃ːˊ	(mɪ̃ˊ+□)	I ask
	ŋɪ̃ːˇ	(ŋɪ̃ˇ+□)	I know
	ŋɪ̃ːhˊ	(ŋɪ̃ːh+□)	I answer
	sɪ˩w̥͡wɪːŋʔˇ	(sɪ˩w̥͡wɪːŋˉ+□ʔ)	I stack it up
	nɪ̃˩læ˥hɑʔ˩	(nɪ̃˩læh+□ʔ)	We will buy it
	m̥͡mɪ̃˩kõˇʔõʔ˥	(m̥͡mɪ̃˩kõʔˇ+□ʔ)	We help

As shown in (20), after open syllables, "□ʔ" is incorporated into root syllable resulting in a long syllable closed by ʔ.

(20)	kãːʔˊ	(kãˊ+□ʔ)	We charge
	hɪːʔˊ	(hɪːˊ+□ʔ)	We plow
	nẽːʔˇ	(neˇ+□ʔ)	We see

The table in (21) displays in schematic form both the oral and tonal consequences of clitic sandhi. For the sake of clarity, sandhi forms are shaded.

(21) Inputs and surface outputs to clitic sandhi

unsuffixed rime→ tone↓	V	Vh	Vː	Vːh	Vʔ	Vhʔ
˩	CVː(ʔ)˩	CV˩h□(ʔ)˩	CVː(ʔ)˩	CVː˩h□(ʔ)˩	CV˩ʔ□(ʔ)˩	CV˩hʔ□(ʔ)˩
˧	CVː(ʔ)˧	CV˧h□(ʔ)˩	CVː(ʔ)˧	CVː˧h□(ʔ)˩	CV˧ʔ□(ʔ)˩	CV˧hʔ□(ʔ)˧
˥		CV˥h□(ʔ)˩		CVː˥h□(ʔ)˩	CVː˥ʔ□(ʔ)˩	CV˥hʔ□(ʔ)˥
ˊ	CVː(ʔ)ˊ	CVˊh□(ʔ)˩			CVˊʔ□(ʔ)˩	CVˊhʔ□(ʔ)˧
ˇ	CVː(ʔ)ˇ	CV˩h□(ʔ)˥		CVː˩h□(ʔ)˥	CV˩ʔ□(ʔ)˥	
ˉ	CVː(ʔ)ˉ			CVː˧h□˥	CV˧ʔ□(ʔ)˥	
˦			CVː(ʔ)˦			

˥	CV꞉(ʔ)˥	CV˥□(ʔ)˩	CV꞉(ʔ)˥	CV꞉˩ h□˩	CV˥ʔ□(ʔ)˩	CV˥ʔ□˩

In (22) I provide several further examples of Type Two Sandhi arranged by trigger.

(22) Example with **M** trigger (**CV˦hʔ□(ʔ)˦**):

ka˩ᵐbeh˦ʔe˦	**(ka˩ᵐbeʔ˦+□)**	I rolled it up

Examples with **H** triggers (**CV˥hʔ□(ʔ)˥**):

nĩ˩ᵐbeh˥ʔe˥	**(ni˩ᵐbeʔ ˥+□)**	I will roll it up
nĩ˩ⁿdʒah˥ʔa˧ ˥	**(ni˩ⁿdʒahʔ ˥+□ʔ)**	We will go home

Example with **LM** triggers (**CV˩˧hʔ□(ʔ)˦**):

ka˩w̰̄en˧ʔ˩˧ne˧ʔ˦	**(ka˩w̰̄en˧ʔ˩˧ +ne˧ʔ)**	The animal was frightened

Examples with **LH** triggers (**CV꞉˩˧h□˥**, **CV˩˧ʔ□(ʔ)˥**):

nĩ˩n̥ʲõn̥˩˧ʔn̥˧˥	**(ni˩ n̥ʲõn̥˧ʔ˥+□)**	Night will overtake me
nĩ˩fi˩ʔi˥	**(ni˩ w̰̄wiʔ˩˧+□)**	I will whistle (to him)

5. "BALLISTIC STRESS"

So-called "ballistic stress" has been discussed in the context of both Chinantec phonology and Chinantec morphology since some of the earliest modern documentations of the language, perhaps beginning with Merrifield's (1963) discussion of the Palantla dialect. In general, the phenomenon has been characterized as a stress-based property of the syllable, involving "an initial surge and rapid decay of intensity with a resultant fortis articulation of the consonantal syllable onset and tendency to loss of voicing of post-vocalic elements", as well as pitch-altering effects (Merrifield 1963, Mugele 1982, Merrifield 1999). According to this account certain roots are lexically marked with ballistic stress, while other are marked with so-called "controlled" (non-ballistic) stress. Note, however, that if ballisticity is treated as a stress-based phenomenon, it constitutes a single linguistic exception to the observation that stress is syntagmatically distributed: the presence of lexical ballistic stress versus lexical controlled stress would constitute a unique case of stress being paradigmatically distributed.

A number of studies—among them Rensch 1966, Silverman 1994, 1995a, 1997, and Holsinger 1998—have instead argued that the ballistic phenomenon is best characterized (at least in Lalana, Comaltepec, and Ojitlán) as laryngeally-based, primarily involving aspiration on the latter portion of the vowel. Silverman proposes that those phonetic attributes of ballisticity that are not phonation-based—pitch effects, and supposed increases in subglottal pressure in particular—are accompaniments to the aspiration that have passively evolved, increasing the likelihood of its successful communication; post-vocalic aspiration being a notoriously weak phonetic phenomenon (Bladon 1986). Thus, vowels in Comaltepec, as in a majority of Otomanguean languages, may be "laryngeally complex": they may possess both tonal distinctions and phonation distinctions, though temporally staggered in order to increase the likelihood of both their salient production and their salient perception: pitch distinctions are most reliably produced and most reliably perceived when occurring with modal (non-breathy; non-creaky) phonation.

Regardless of how ballisticity is characterized in abstract phonological terms though, it would not be unreasonable to suspect that the ballistic effect phonetically manifests itself quite differently in different Chinantecan languages.

CONCLUSION

This brief discussion of Comaltepec Chinantec morpho-phonology is clearly non-exhaustive. Indeed, even in the far more detailed analyses presented in the work of Anderson, Pace, and colleagues, the authors assure readers that many details remain either un-reported or as yet ill-understood, presumably oftentimes both. Rather, as stated in the introduction, and, I hope, to make good on the promise of the title, I have herein provided a mere summary of some of the most salient aspects of the remarkably rich, remarkably complex, and indeed, remarkably beautiful morpho-phonology of Comaltepec Chinantec.

REFERENCES

Anderson, J.L. 1989. *Comaltepec Chinantec Syntax*. Studies in Chinantec Languages v. 3. Summer Institute of Linguistics.

Anderson, J.L., I.H. Martinez, and W. Pace. 1990. "Comaltepec Chinantec Tone". In W.R. Merrifield and C.R. Rensch, eds., *Syllables, Tone, and Verb Paradigms*. Studies in Chinantec Languages v.4. Summer Institute of Linguistics, 3-20.

Bladon, A. 1986. "Phonetics for hearers". In G. McGregor (ed.) *Language for Hearers*. Oxford: Pergamon Press. 1-24.

Holsinger, David J. 1998. "Tone and ballistic stress in Ojitlán Chinantec". Manuscript, University of Wisconsin-Madison.

Merrifield, William R. 1999. "Palantla Chinantec: phonetic experiments on nasalization, stress, and tone". International Journal of American Linguistics 65:303-23.

Mugele, R.L. 1982. "Tone and Ballistic Syllable in Lalana Chinantec". Ph.D. dissertation, University of Texas at Austin.

Pace, W. J. 1990. Comaltepec Chinantec verb inflection. In W.R. Merrifield and C.R. Rensch, eds., *Syllables, Tone, and Verb Paradigms*. Studies in Chinantec Languages v.4. Summer Institute of Linguistics, 21-62.

Rensch, C.R., and C.M. Rensch. 1966. "The Lalana Chinantec syllable". In *Summa anthropologica enhomenaje a Roberto J. Weitlaner*. Instituto Nacional de Antropologia E Historia, Mexico, 455-463.

Rensch, C.R. 1968. *Proto Chinantec Phonology*. Papeles de la Chinantla VI. Seria Cientifica 10. Museo Nacional de Antropologia, Mexico.

Rensch, C.R. 1976. *Comparative Otomanguean Phonology*. Indiana University, Bloomington.

Rensch, C.R. 1977. "Classification of the Otomanguean Languages and the Position of Tlapanec". In *Two Studies in Middle American Comparative Linguistics*, Summer Institute of Linguistics/University of Texas at Arlington, 53-108.

Rensch, C.R. 1978. "Ballistic and Controlled Syllables in Otomanguean Languages". In A. Bell and J.B. Hooper, eds., *Syllables and Segments*. Amsterdam: North Holland Publishing Company, 85-92.

Rensch, C.R. 1989. *An Etymological Dictionary of the Chinantec Languages*. Studies in Chinantec Languages v.1. Summer Institute of Linguistics.

Rensch, C.R., and C.M. Rensch 1966. "The Lalana Chinantec Syllable". In *Summa Anthropologica en homenaje a Roberto J. Weitlaner*. Instituto Nacional de Antropologia E Historia, Mexico, 455-463.

Silverman, D. 1994. "A Case Study in Acoustic Transparency: [spread glottis] and Tone in Chinantec". In M. Gonzalez, ed., Proceedings of North Eastern Linguistics Society 24, 559-572.

Silverman, D. 1995 [1997]. *Phasing and Recoverability*. New York: Garland.

Silverman, D. 1997a. "Laryngeal complexity in Otomanguean vowels". *Phonology* 14:235-61.

Silverman, D. 1997b. "Tone sandhi in Comaltepec Chinantec". *Language* 73:473-92.

Silverman, D. 2003. "Pitch discrimination during breathy versus modal phonation". In John Local, Richard Ogden, and Rosalind Temple, eds., *Papers in Laboratory Phonology VI*, Cambridge University Press. 293-304.

Silverman, D. 2005. "The phonology of Chinantecan". *Encyclopedia of Language and Linguistics*, 2nd Edition, Elsevier Publishing House.

Silverman, D. 2006. *A Critical Introduction to Phonology: of Sound, Mind, and Body*. London/New York: Continuum Books.

Silverman, D. 2012. *Neutralization (Rhyme and Reason in Phonology)*. Cambridge University Press.