

Syllables, Tone, and Verb Paradigms

Studies in Chinantec Languages 4

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Studies in Chinantec Languages 4

William R. Merrifield and Calvin R. Rensch

Editors

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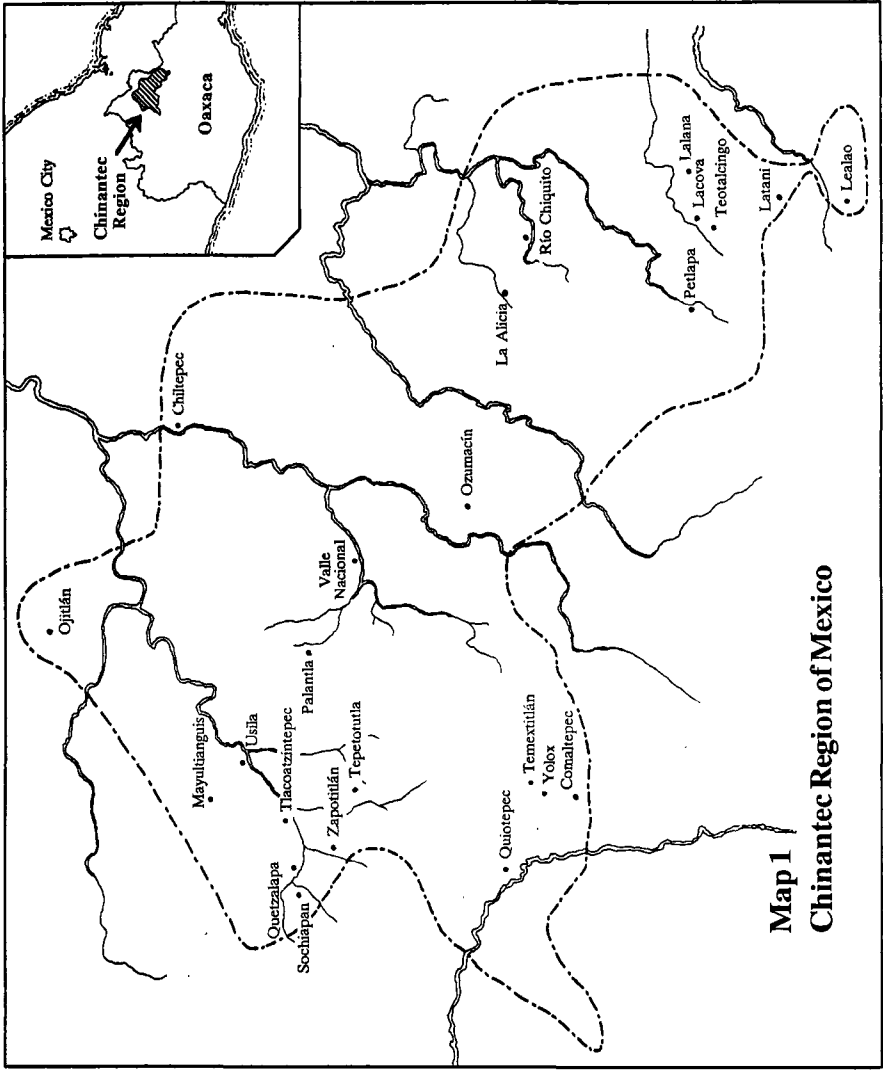
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Map 1
Chinantec Region of Mexico

Phonological Realignment in Lealao Chinantec

Calvin R. Rensch

The principal features of the phonological systems of several Chinantec languages have already been described (Foris 1973, Merrifield 1963, Rensch and Rensch 1966, Robbins 1968, Rupp 1989 and 1990, Skinner 1962, and Westley 1971). The Chinantec syllable is typically quite simple in structure. The obligatory constituents are a consonant, a vowel, and a tone; in many morphemes these are the only constituents, and in a few Chinantec languages even the initial consonant is not obligatory. In every language a small set of complex consonantal onsets occurs and vocalic nasalization may occur with the vowel. In contrast to the simple syllable structure, however, the sets of items occurring in the several constituent positions are usually rather large.

The development of Lealao Chinantec¹ from the parent language, Proto Chinantec (Rensch 1968, 1989), is noteworthy because of the creation of a large set of consonantal syllable onsets and the retention of the full system of prosodic features, which contrast with the simple, on the whole rather primitive, vowel system.

In Proto Chinantec the syllable of the shape *CV was opposed by one of the shape *CiV, that is, one in which a high front vowel separated the main vowel from the consonant. The intervening *i was apparently somewhat ambivalent, affecting the nature of both of the adjacent constituents. Some modern Chinantec languages have interpreted it as

¹The synchronic study of Lealao Chinantec has been carried on by James Rupp, who has supplied the Lealao forms cited here.

part of the syllable nucleus along with the main vowel, and even more have interpreted it as part of the nucleus in some environments and part of the onset in others. In Lealao, the intervening *i has uniformly been grouped with the initial consonant, resulting in a series of palatal consonants.² Thus, this feature, which frequently was instrumental in the development of complex vowel systems of up to ten vowels, has in Lealao Chinantec aided in the multiplication of consonants, leaving the vowel system quite simple.

The tone system of the parent language was characterized by at least five tone contrasts, which have been labeled *high, *low, *high-low, *low-high, and *high-low-high. All of the tone systems which have been studied have effected some mergers, simplifying the system at some points; but Lealao seems to have undergone less collapsing of the archaic system than most. The northern languages of Ojitlán and Usila have four- and five-tone systems, respectively. All other languages except Lealao and Tlacoatzintepec Chinantec have fewer tones but have a ballistic accent intimately associated with the tone system.³ The tone contrasts of Lealao and Tlacoatzintepec require a network of four tones as well as a ballistic accent. In addition, some of the differences of tone in Usila and Ojitlán preserve length contrasts of the parent language, but this is almost never the case in Lealao.

In the sections that follow, the development of the system of onsets (§1), nuclei (§2), and prosodic features (§3) will be described.

1. Onset consonants

The onsets of Lealao Chinantec are simple /p t k ʔ b d z g f s h v m n ŋ l r/, preaspirated /hm hn hŋ hl/, palatal /ty ky dy zy gy sy hy ny ŋy ly y/, preaspirated palatal /(hny) hŋy/, and labial /kw gw/.

1.1. Loss of *ʔ from clusters. One of the most sweeping changes that has taken place in Lealao Chinantec is the merger of *ʔw with *w, *ʔy

² It is worth noting that the development in Lealao largely parallels that of Sochiapan in this respect, although the two languages are far apart geographically and in many ways linguistically.

³ Robbins (1968) describes a three-tone system with ballistic accent, but the data from Quiotepec are cited here in terms of an earlier analysis (Robbins 1961) which utilized four tones but no ballistic accent. An even more recent interpretation of Quiotepec tone is found in this volume (Gardner & Merrifield) which retains the basic elements of Robbins 1968.

with *y, and all other *?C clusters with the corresponding *C.⁴ As a result, no clusters of glottal stop plus consonant occur in Lealao Chinantec.

- 1 *ʔwá:^{HL5} night U ʔue² S ʔwá² midnight Tp a²ʔuá² Pa ʔwu² LI ʔwá:²³ Le vo:⁴ Qi ʔwoh⁴ Co ʔwá:¹².
- 2 *wá:^L a long time U ue⁴ TI gwé⁴ S we²³ Tp uá² Pa wú² LIwá:h³ Le vó:³ Qi woh³.
- 3 *ʔya:^L sun, sunshine Oj ʔye² U ʔdyie³ TI gyu³ S ʔyu² Tp ʔiog²Pa ʔyew² LI ʔyo:³ Le ya:³ Qi ʔyiah²³ Co ʔye:².
- 4 *ya:^L avocado U u⁴gu³dyie³ TI gweg³dyú³ S kwi¹dyu¹ Tp kuig²giong² Pa gu³gyew² LI mǝ³¹ku¹yo:³ Le gu³ya:³ Qi kwo³yiah²³.
- 5 *ʔnǝ:^L widow Oj ca² mǝ³ ʔnǝ³ U a³ʔnag⁴ TI ca³nag S ca²ʔnǝ²³ Tp ʔio³¹ ʔnǝg² Pa za²ʔnǝy² LI mǝh³ ʔnǝ:h³ Le za³ nǝ:³ orphan Qi ca³ʔnǝh³ orphan Co dia ʔnǝ:¹.
- 6 *nǝ:^{LH} mushroom Oj mǝ³na¹ U a¹ma³nag⁴³ TI meg²nǝg⁴ S ma^{na}² Tp nǝ¹nag³² Pa nay³² LI nǝ:h² Le nǝ:² Qi nih⁴³ Co nǝ:²¹.

1.2. Development of palatal onsets. As mentioned above, the intervening *i of *CiV syllables in Proto Chinantec has combined with the initial *C to form complex palatal onsets in Lealao Chinantec. This palatal *i is expressed phonetically in Lealao in three different ways, namely, (1) as a vocalic transition between certain onset consonants and a following nuclear vowel without significant palatal influence on the onset consonant itself, (2) as a palatalized onset consonant without significant vocalic transition to the following nuclear vowel, and (3) as a palatalized onset consonant with vocalic transition to the following nuclear vowel.

⁴*ʔw and *ʔy are the labels given to these clusters in Rensch (1989) and probably reflect the phonetic nature of the clusters even at the earlier Proto Chinantec period. They are the clusters which were labeled *ʔb and *ʔz in Rensch (1968) for reasons of distributional economy.

⁵Capital letters following Proto Chinantec reconstructed forms represent reconstructed tones: ^H (high), ^L (low), ^{HL} (high-low), ^{LH} (low-high), and ^{HLH} (high-low-high). Letters before the contemporary language forms represent the names of the languages: Oj (Ojtlán) U (Usila) TI (Tlacoatzintepec) S (Sochiapan) Tp (Tepetotutla) Pa (Palantla) LI (Lalana) Le (Lealao) Qi (Quiotepec) Co (Comaltepec). The tones of Lealao are numbered from 4 to 1 to indicate low, mid, high, and very-high where Rupp 1989 and Rupp 1990 use /^L ^M ^H ^{VH}/, respectively. Sequence 32 corresponds to /^LM/ and 42 corresponds to /^LH/. The high back unrounded Lealao vowel which is represented elsewhere as /i/, is here written as /i/ in conformance with Rensch 1989.

The first type of palatal expression occurs in the case of *tiV → /tyV/ [tiV],⁶ *niV → /nyV/ [niV], and *liV → /lyV/ [liV], where neither the preceding consonant nor the following vowel is significantly influenced phonetically by the intervening palatal element which is realized primarily as the vocalic transition [i] after these consonants.

7 *tia:^L white Oj *te*² U *tie*³ Tl *tyu*³ S *tyó*² Tp *tiog*² Pa *tew*² Ll *tā*³
Le *tya*³ [tia:³] Qi *tah*²³ Co *te*².

8 *niá:^L yellow Oj *ne*³ U *nie*⁴ Tl *meg³nyew³* S *mi³nyó²³* Tp *nio*²³
Pa *néw*² Ll *ne:h*³ Le *nyá*³ [niá:³] Qi *nah*³ Co *né*².

9 *liá:^L trap Oj *la*³ U *a²lia⁴* Tl *lyá*³ S *lya*²³ Tp *ci¹liá²* Pa *lí*² Ll *läh*³
Le *lyá*³ [liá:³] Qi *la*²⁴ Co *liá*¹².

The second type of palatal expression occurs in the case of *ziV → /zyV/ [džV], *siV → /syV/ [šV], and *ŋiV → /ŋyV/ [ñiV], where the onset consonant has palatalized significantly without a significant vocalic transition to the the following nuclear vowel.

10 *zia:^{HLH} grandson Oj *yi²če³¹a²* U *a²tyie¹* Tl *cyo*⁴² S *cyo*¹ Tp
*zio*²¹ *za*² Pa *zyew*¹ my grandson Ll *jo*²³² Le *zya*⁴² [dža:⁴²] Qi
*tyiah*¹² my grandson Co *gie*^{r12}.

11 *siá:^{LH} rafter Oj *ɸma*² *syá*³ U *a²ɸma³* *sia*⁴³ Tl *ma³ɸyá³* S *ɸya*²³
Pa *ɸma*² *cyi*³² Ll *šah*² Le *syá*² [šá:²] beam.

12 *ŋiú:^{HL} nine (inanimate reference) Oj *ñi*⁴ U *ñi*³⁴ Tl *ŋi*² S *ŋyu*²³
Tp *ŋi*³ Pa *ŋyu*³ Ll *ñöh*²³ Le *ŋyú*⁴ [ñú:⁴] Qi *ñü*³⁴ Co *ŋi*^{ó1}.

Similarly, /zy/ [dž] is the development of *z, /sy/ [š] is the development of *s, and /ŋy/ [ñ] is the development of *ŋ when these simple onsets precede *i as a nuclear vowel.⁷

13 *zi:^L wind Oj *či*³ U *tyi*⁴ Tl *ci*³ S *ci*²³ Tp *zi*² Pa *zi*² Ll *jih*³ Le *zyé*³
[džá:³] Qi *tyi*²⁴ Co *gi*¹².

⁶Under obscure conditions, perhaps that of weakened stress, *tiV developed in Lealao as *dyV* rather than the usual *tyV*.

⁷Whether these consonants should be interpreted as /zy sy ŋy/ or simply as /z s ŋ/ in this context is moot since there is no such contrast in Lealao before /i/. The forms /zy sy ŋy/ are chosen here to more clearly reflect the development of the onset consonant in such forms as *zi which result in Lealao [zyi] (see set 13) where *i became /i/ rather than /i/.

- 14 ***si**(:)? be standing Oj *si*^{ʔ3} *ʔni*² U *sei*^{ʔ43} Tl *θi*^ʔ Tp *ci*^{ʔ32} Pa *ci*^{ʔ32}
 Ll *ʃi*^{ʔ23} Le *syi*^{ʔ3} [ʃi^{ʔ3}] Qi *si*^{ʔ3} Co *si*^{ʔ2}.
- 15 ***ŋi**^H salt Oj *si*¹*ŋi*¹ U *o*¹*ŋi*² Tl *ŋi*² S *ŋyi*¹ Tp *ci*¹*ŋi*¹ Pa *ŋyi*¹ Ll *hwi*²
*ŋi*² Le *fi*^{ʔ42} *ŋyi*² [fi^{ʔ42} ŋi²] Qi *ŋi*² Co *ŋi*¹.

The third type of palatal expression occurs in the case of velar consonants **ki*V → /kyV/ [tʃ^hiV], **gi*V → /gyV/ [dʒiV], and laryngeal **hi*V → /hyV/ [ʃiV], where the onset consonant has palatalized without the loss of a vocalic transition to the nuclear vowel.

- 16 ***ki**^{LH} coat Oj *ki*³ U *a*²*ki*⁴³ Tl *ki*³ S *kyu*²³ Tp *i*¹*ki*³² Pa *kyú*³²
 Ll *kyöh*² Le *kyú*² [tʃ^hiú²] Qi *tyü*³ Co *ki*^ó²¹.
- 17 ***giá**^{HL} ten (inanimate reference) Oj *kya*⁴ U *kia*³⁴ Tl *kyá*² S
*kya*²³ Tp *gia*³ Pa *gyi*³ Ll *gyah*²³ Le *gyá*⁴ [dʒiá⁴] Qi *dya*³⁴ Co *gi*¹.
- 18 ***hyi**^L paper, book Oj *mo*³¹ *yi*² U *ma*²*hdyi*³ Tl *si*³ S *mu*¹ *si*² Tp
*si*² Pa *si*² Ll *hi*³ Le *hyi*³ [ʃyi³] Qi *hi*³⁴ Co *ʔma* *hi*¹².

Similarly, as in the case of *z, *s, and *ŋ, the velar consonants *k and *g and laryngeal *h have also palatalized preceding the nuclear vowel *i.

- 19 ***ki**^{LH} trash U *ma*²*ki*³ Tl *meg*²*kég*¹ S *ma*¹*ki*³² Tp *hme*¹*ki*³² Pa
*kyi*³² Le *kyi*³ [tʃ^hi³] Qi *tyi*⁴ Co *ki*².
- 20 ***gi**: tear (verb) Oj *ki*² *ʔni*² Pa *gyiw*² Ll *gi*³ Le *ri*⁴*gyi*³ [ri⁴dʒi³].
- 21 ***hi**:^H bumblebee U *a*²*hai*³² Tl *háy*¹ S *he*²³ Tp *i*¹*hei*¹ hornet Pa
*hey*¹ Ll *hi*² Le *syi*² [ʃi²] Qi *hih*².

1.3. The development of *n, *ŋ, *s, and *h. The palatalization of *n and *ŋ, on the one hand, and *s and *h, on the other, before nuclear *i has resulted in the merger of these two pairs of consonants to /ŋy/ [f̃i] and /sy/ [ʃ̃], respectively, in this context.⁸

⁸Rupp (1990) reports that ŋyV and nyV are distinguished by some speakers as indicated above, but not by all; while hŋyV and hnyV are in free variation. In the speech of those who do not distinguish ŋyV and nyV, the merger which took place before *i has also taken place before *iV. Since these mergers involve complete neutralization of /n/ and /ŋ/ in these contexts, the result could as easily be considered /ny hny/ as /ŋy hŋy/, but the fact that [f̃i] represents /ŋy/ for some speakers argues for the latter choice.

- 22 *ni^H face Oj *ñi¹a²* U *ma⁵nei²* Tl *ni²* S *ɲyi¹* co Tp *zi²ne²¹* za² Pa
ni¹ Ll *ñi²* Le *ɲyi²* [ñj²] Qi *ni²* Co *ni¹*.
- 23 *ɲi^H salt Oj *sɪ¹ñi¹* U *o¹ñi²* Tl *ɲi²* S *ɲyi¹* Tp *ci¹ɲi¹* Pa *ɲyi¹* Ll *hwi²*
ñi² Le *fɛ:²ɲi²* [fɛ:²ñj²] Qi *ñi²* Co *ɲi¹*.
- 24 *si(:)? be standing Oj *si²* *ɲni²* U *sei²* Tl *θi²* Tp *ci²* Pa *ci²*
Ll *ši:²* Le *sy²* [šj²] Qi *si²* Co *si²*.
- 25 *hi:^H See set 21.

The development of *h → /s/ before *i, however, apparently occurred only in an oral environment. The result was /h/ when the vowel was nasal or was followed by nasal syllable closure.

- 26 *hj:^H bed, raft Oj *hɛ³* U *tag³²* *həi³²* Tl *həy⁴* Tp *ci¹hɛj¹* Pa *hɛy¹*
Ll *hɛ:²* Le *hɛ:²* Qi *hɛh²* beam Co *hɛ:¹*.

Although *s and *h have merged in Lealao before an oral nuclear *i, their development before *iV is not completely parallel. *siV became /syV/ regardless of the quality of the nuclear vowel, but *h became /hy/ only in the context *hiu.

- 27 *siu^L copal, incense Oj *sɪ²* U *sɛj³* Tl *θi³* S *θy²* Tp *ce²* Pa *cy²*
Ll *šɔ³* Le *sy³* [šy³] Qi *sü³⁴* Co *sɔ¹²*.
- 28 *sia See set 11.
- 29 *hiu:ʔ^H armadillo Oj *hi²* U *a⁵hei²* Tl *hu²* S *hu²* Tp *i¹hi²*
Pa *hy²* Ll *hyö:²* Le *hyi²* [šyi²] Qi *xüh²* Co *hyö:²*.
- 30 *hia(:)^{LH} spider Oj *ha²* *mi²* *ya¹* U *a¹hia²³* Tl *hyá⁴* S *ci ha* Tp
i¹hia³² Pa *cyi¹hyi³²* Ll *hä:³* Le *he:³* Qi *he⁴* Co *hia²*.

1.4. Loss of *r and *y. Like the nearby language of Lalana, Lealao Chinantec has lost the consonants *r and *y in syllables closed by the nasal. The *r was lost regardless of other features of the syllable. The *y can be shown to have been lost only in the form *yu:ʔŋ grandfather, in which the presence of final nasal is uncertain.

- 31 *ru:ʔŋ brother Oj *yi²* *rɔ²a²* U *a²ra²* Tl *rɛw²* S *ra²* co Tp
rj² Pa *rɔ²* younger sibling Ll *u:ʔn²* companion, spouse Le
ó:y² companion Qi *ruih²* Co *ruiŋ²*.

32 ***yu:ʔŋ^H** grandfather Oj *hmi² ʔyi²a² U ni³dyei^{ʔ32} Tl ni²dáw^{ʔ1}*
S nyu¹de^{ʔ32} Tɔ gi^{ʔ31} Pa hi²gyu^{ʔ1} Ll yi²³u:^{ʔ2} Le nyú⁴u:^{ʔ2} Qi
yüh^{ʔ42} Co yö:^{ʔ21}.

1.5. Development of f and v. One further development has affected the system of syllable onsets of Lealao Chinantec. The Proto Chinantec sequence *hw has been changed to /f/ and the semivowel *w has been changed to a matching /v/, thus adding to the voiceless and voiced fricative series, respectively.

33 ***hwí:^L** town Oj *he³¹ hwi² U he¹heu³ Tl i²hêw¹ S hwi² Tɔ huig²*
Pa hwi^{y2} Ll hwi:³ Le fi:³ Qi fuh²³ Co hwi:².

34 ***wí:^L** vine Oj *çi¹ wí² U dya¹gu³ ʔua^{ʔ3} S wú² Tɔ ni¹uig² Pa wiy²*
Ll wí:³ Le vî:³ Qi wuh²³ Co wí:².

2. Nuclei

The nuclear vowel of the Proto Chinantec syllable was either simple or was modified by one or more of the following elements: (a) nasalization, (b) closure by glottal stop, (c) closure by a nasal consonant.

The system of syllabics of Proto Chinantec was a simple set of paired palatal and nonpalatal syllabics (Rensch 1968, §2.5.):

palatal:	*i	*iu	nonpalatal:	*ɨ	*u
	*e	*ia		*ə	*a.

As indicated above, the first part of *iV nuclei became a part of the onset in Lealao Chinantec syllables. Thus, a system of only six simple vowels—*i, *e, *ɨ, *ə, *u, *a—developed at an intermediate stage.

2.1. Split of *ə. The system of syllabics was further modified by a split of the vowel *ə. Following *h or a labial consonant the oral vowel was backed and rounded to create a back vowel /o/. Following other consonants or when nasalized, it was fronted to /e/, which merged with the development of *e. Thus, the resultant Lealao system is /i e ɨ a u o/.

35 ***hə:** look Oj *hə³¹ ʔni² U he²³ Tl há³ ceg³ S hie¹² Tɔ hág³² za²*
Pa háy³² Ll ho:³² Le ho:³² Qi həh²³ Co há:r².

36 ***ʔwá^{HL}** land Oj *ʔwo⁴ U ʔue³⁴ Tl gwé² S ʔwe³² Tɔ ʔuə³ Pa ʔwa³*
Ll ʔwəh²³ Le vó⁴ Qi ʔwo²⁴ Co ʔwá².

- 37 *ʔə sing Oj ʔa¹ ʔni² U ʔe²³ Tl ʔá² S ʔie co Tp ʔa³² za² Pa ʔiw³²
za² Ll ʔe²³ Le za³ ʔe⁴ teacher Qi ʔa⁴ ca² Co ʔar².
- 38 *mə: bone Oj na¹mo² U na²ʔe²³ Tl mo³⁴ S mu³² Tp ni¹mu³²
Pa mu² Ll me²³ Le me⁴ Qi moh⁴ Co mó:¹².
- 39 *mé:^{LH} cane liquor Oj ma² cane Tl mó⁴ S mú² Ll me:h² Le
mé:² liquor distilled from maguey Qi mah⁴³ Co mé:²¹.

2.2. Merger of *i and *ī. The development of *i has merged with that of *ī after *s and *z in Lealao Chinantec. The sequences *si/*zi and *sī/*zī have generally remained distinct, however, since the consonants were previously palatalized to /sy/ and /zy/ before *i in most environments, whereas no such palatalization took place before *ī.

40 *si See set 14.

41 *si:^L moon Oj si:^{ʔ2} U seg^{ʔ3} Tl ʔeg^{ʔ4} S ʔi:^{ʔ2} Tp ci:^{ʔ2} Pa ci:^{ʔ2} Ll
si:^{ʔ3} Le si:^{ʔ3} Qi sih^{ʔ23} Co si:^{ʔ12}.

42 *zi See set 13.

43 *zi:^{LH} heart Oj mi³ci³a² U ʔ⁴cei⁴³ Tl cég³ S mi³ci²³ Tp zí:³² Pa
ziw³² Ll zih² Le zí:² Qi ci³ Co dí:²¹.

2.3. Merger of *i and *iu, *e and *ia. After *h, the nuclei *i and *iu have merged in most environments. After *h and *ʔ, the nuclei *e and *ia have merged.

44 *hi See set 21.

45 *hiu: blow (verb) Oj hi² ʔni² U hai²³ Tl hi S hyei³² co² Tp héi²
Pa hyéw² Ll hyö:³² Le ga³si:³² Qi xüh²³ Co hyö:r².

46 *he^H balsa tree U na²ʔma³ he¹ Tl ma³ he² S ʔma² hie³¹ Tp
ʔma² hā¹ Pa ʔma² he¹ Ll ʔmo³ heh² Le mí:y^{ʔ3} he² Qi ʔmo³ he².

47 *hiá arrive Oj hya²³ ca² U hia²³ Pa hyi³ Ll ri²³hā³ Le ri⁴he³.

48 *ʔe: what?, which? Oj ʔe² S ʔe Tp ʔe² Pa ʔe² Ll ʔe:² Le ʔe² Qi
ʔeh²⁴² Co ʔe¹.

49 *ʔiá:^{HL} tomorrow Oj ʔye⁴ U ʔie³⁴ Tp ʔióg³ Pa ʔyá² Ll ʔä:h²³
Le hā⁴ mi¹ ʔe:³.

2.4. Nasalized vowels, final *ʔ, and final *ŋ. The nasalized vowels of Proto Chinantec and the final glottal closure were faithfully preserved in Lealao Chinantec, as they have been quite generally in all the languages. The final nasal element developed as /n/ following the nuclear vowel /i/—at least in the speech of some—as a marker of animate reference; following other vowels the marker of animate reference is /y/ (see §4.3).

- 50 *tá:^{LH} thorn Oj tɔ² U a²tɔ⁴³ Tl tɔ⁴ S tɔ² Tɔp ni¹təu³² Pa təw³²
Ll tɔ:h² Le tá:² Qi tɔh⁴³ Co tɔ:²¹.
- 51 *ʔya:ʔ^{LH} jaguar Oj ʔya² U a²ʔdya³ li²ʔ²³ Tl gya⁴ S ʔya³² Tɔp
zi²ʔia² Pa ʔye³² Ll ʔyo:³ Le ya³ Qi ʔya⁴ i² Co ʔye:¹².
- 52 *kj:ŋ it costs Oj kɨ² U kɨ⁴³ Tl kɨ⁴ S kyɛ Tɔp kɛ³² Pa kyɛ³² Ll
kɨ:hn²³ Le kyɛ:n⁴ Qi tyɨ³ Co ki:ŋ²¹.
- 53 *giá:ŋ^{HL} seven (animate reference) Oj kyɛ⁴ U kɨ³⁴ S kyɔ Tɔp
giɔ³ Pa gyow³ Ll gya:hn²³ Le gyá:y⁴ Qi dyai²³.

3. Prosodic features

The prosodic features of Lealao Chinantec are length, ballistic accent,⁹ and tone.

3.1. Length and accent. The features of vocalic length and accent have developed quite regularly from the ancestor language.¹⁰

- 54 *ta^L reed Oj ma² ta² U a²ʔma³ ta³ S ʔma ta Tɔp ni¹ʔma² ta³²
Pa ʔma²ta² Ll ʔmo³ ta³ Le mɛ:y³ ta³ Qi to³⁴ Co ta¹².
- 55 *ta:^L banana Oj to² U o¹to³ Tl tew³ S tó² Tɔp ni¹tau² Pa tiw² Ll
to:³ Le ta:³ Qi toh²³ Co to:².
- 56 *ʔu^{LH} glass, mirror Oj ʔu¹ U a²ʔeu³ Tl ʔú⁴ S ʔu³² Tɔp ni¹ʔi² Pa
ʔi³² Ll ʔu³ Le ʔu³ Qi ʔu⁴.
- 57 *ʔú^{LH} casserole Oj ho¹wi² ʔu² U a²ʔeu⁴³ Tl ʔú³ S ʔu²³ Tɔp
ni¹ʔi³² Pa ʔi³² Ll ʔuh² Le ʔú² Qi ʔu³ Co ʔú:²¹.

⁹Compare Rensch and Rensch (1966:456f) for a somewhat different treatment of a similar phenomenon. For reasons of distribution, the ballistic accent is there analyzed as the postnuclear variant of /h/, which apparently is its source in Proto Otomanguean (Rensch 1976, §9.2.3). Rensch (1968, §2.8) discusses the ballistic accent of Proto Chinantec in relation to the tone system.

¹⁰For an exception to the regularity in the development of vocalic length, see §3.4.

3.2. Tones in open accented syllables. The development of the tone system has been more intricate than that of length and accent with some conditioning of development in terms of the other two features. The development of the tone system was carried out in the most straightforward manner in open syllables bearing the ballistic accent, namely, *H → /1/, *LH → /2/, *L → /3/, and *HL → /4/.

- 58 *hmí:^H braids Oj hmi¹ čí¹a² U a²hú²³ Tl hmáy¹ S hmei¹² Tp hméi¹ Pa hméy¹ Ll hmi:h² Le hmí:¹ Qi hmih¹ tyi² Co hmí:¹.
- 59 *hni:^{LH} cloud Oj hni² U o¹hnai⁴³ Tl hnáy⁴ S hné² Tp hnei³² Pa hnew³² Ll hni:h² Le hñi:² Qi hnih³² Co hni:²¹.
- 60 *rá:^L sweet Oj ro³ U ro⁴ Tl réw³ S ró²³ Tp ráu² Pa ríw² Ll ro:h³ Le rá:³ Qi roh³ Co ró:².
- 61 *giá:^{HL} seven (inanimate reference) Oj kye⁴ U kie³⁴ Tl kyú² S kyo²³ Tp gio³ Pa gyo³ Ll gya:h²³ Le gyá:⁴ Qi dya³ Co gié².

This development—in open syllables bearing ballistic accent—was the same whether the syllable included vocalic length or not.

The sequence *HLH developed as tone /1/ in syllables with the ballistic accent, thus merging with the development of *H.

- 62 *mí:^{HLH} tick Oj sya¹ mi³¹ yi² U a¹si²u² Tl mag² S mai¹ Tp i¹mig¹ Pa may¹ Ll mi:h² Le mí:¹ Qi mih²⁴² Co mi:¹².

3.3. Tones in open unaccented syllables. In syllables not bearing the ballistic accent, *H was lowered to /2/, *L and *LH merged as tone /3/, *HL became tone /4/, and *HLH became the sequence /42/.

- 63 *ʔa:^H mouth Oj ʔo³¹a² U ʔo³² S ʔo³co² Tp mi²ʔo²¹ za² Pa ʔaw¹ Ll ʔo:² Le ʔa:² Qi ʔoh² Co mi ʔo:¹.
- 64 *kə:^L one (inanimate reference) Oj kə² U kə³ Tl kəw³ S kə² Tp kəu² Pa kəw² Ll kə:³ Le kə:³ Qi kəh²³.
- 65 *tu:^{LH} defecate Oj ma²tu² U tau³ Tl taw³⁴ Tp tag³² za³ Pa taw³² Ll tu:³ Le ga³tu:³ Qi tuh⁴.
- 66 *ʔu:^{HL} chili Oj mi² ʔə² U u⁴ʔəu²³ Tl ʔəw⁴ S ʔi² Tp mi²ʔəg² Pa ʔəw² Ll ʔu:²³ Le ʔu:⁴ Qi ʔuh⁴ Co ʔu:¹².
- 67 *na:^{HLH} lard Oj no³¹ U o¹no¹ Tl no⁴² S no¹ Tp ti¹no¹ Pa naw¹ Ll no:²³² Le na:⁴² Qi noh²⁴² Co no:¹².

The source of Lealao tone /1/ in syllables with no ballistic accent is unknown at present. It seems to be cognate with the sequence /31/ in Lalana, although the more common correspondence is Lalana /31/ ~ Lealao /21/. In any event, the source of the Lalana /31/ is equally unclear.

68 ***hwi**^{LH} path Oj *hwi*² U *heu*³ Tl *hwég*⁴ S *hwi*³² Tp *hwi*³² Pa *hwi*³² Ll *hwi*³¹ Le *fi*¹ Qi *fu*⁴ Co *hwi*². (The Lalana-Lealao group shows the anomalous 31 ~ 1 correspondence. Were they to reflect *LH, they would both show tone 3.)

3.4. Tones in checked accented syllables. The development of tones in syllables checked by glottal stop is considerably more complex than that in unchecked syllables. In general, *CV:ʔ syllables have become /CVʔ/, and *CṼ:ʔ syllables have become /CṼʔ/. At least this is so with the development of *H, *L, and *LH. Long syllables with or without the ballistic accent, however, have remained long with *HL and *HLH. The origin of the long checked syllables apart from *HL and *HLH is not clear.

The tone development in /CṼʔ/ syllables parallels that of /CVʔ/ syllables as described above in §3.2, namely,

*CṼ:ʔ^H → CṼʔ¹
 *CṼ:ʔ^L → CṼʔ³
 *CṼ:ʔ^{HL} → CṼʔ⁴

No *CṼ:ʔ^{LH} syllables have as yet been identified, but rather /CṼʔ/ has developed from *CṼʔ^{LH} and some *CṼ:ʔ^H syllables.

69 ***ʔmé**:ʔ^H mole U *a*²*ʔma*^{ʔ2} Tl *má*^{ʔ1} S *ʔmá*^{ʔ1} Pa *ʔmá*^{ʔ1} Ll *ʔme*^{ʔ2} Le *mé*^{ʔ1} Co *ʔme*^{ʔ1} (accent expected).

70 ***tá**:ʔ^{LH} bee Oj *to*^{ʔ4} U *a*¹*ma*²*to*^{ʔ43} wasp Tl *to*^{ʔ4} (accent expected) S *mu*^{ʔ4} *to*^{ʔ2} (²³ expected) Tp *i*¹*si*²*tá*^{ʔ32} Pa *ta*^{ʔ32} Ll *to*^{ʔ2} Le *tá*^{ʔ2} Qi *to*^{ʔ3} honey bee Co *ta*^{ʔ2}.

71 ***siá**:ʔ^H crab U *a*⁴*sia*^{ʔ2} Tl *ʔyá*^{ʔ1} S *ci*¹*ʔyá*^{ʔ2} Tp *i*¹*ciá*^{ʔ1} Pa *cyí*^{ʔ1} Ll *ʃo*^{ʔ2} Le *syá*^{ʔ2} Qi *sah*^{ʔ1} Co *se*^{ʔ1}.

72 ***má**:ʔ^L mountain Oj *ma*^{ʔ3} U *a*²*ma*^{ʔ4} Tl *má*^{ʔ3} S *ma*^{ʔ3} Tp *má*^{ʔ2} Pa *má*^{ʔ2} Ll *mo*^{ʔ3} Le *má*^{ʔ3} Qi *moh*^{ʔ34} Co *mó*^{ʔ12}.

73 ***ʔi**:ʔ^{HL} weight, peso Tp *ʔéi*^{ʔ3} Pa *ʔé*^{ʔ3} measure Ll *ʔi*^{ʔ23} Le *ʔi*:ʔ⁴ Qi *ʔih*^{ʔ34} Co *ʔi*^{ʔ12}.

3.5. Tones in checked unaccented syllables. As in unchecked syllables, so in /CVʔ/ syllables *H became tone /2/ and *L and *LH have merged as tone /3/ (see §3.3).

74 *gwa:ʔ^H earth Oj *kwaʔ¹* U *o¹kuaʔ³²* S *kwáʔ¹* (reflects accented syllable) Tp *guaʔ³¹* *lag¹* adobe Pa *gwaʔ¹* Ll *gwo:ʔ²* Le *gwaʔ²* Qi *kwohʔ⁴²* Co *gwo:ʔ²¹*.

75 *CV:ʔ^L See set 41.

76 *tu:ʔ^{LH} bag Oj *sí²tuʔ²* U *a²toʔ³* *ʔuʔ³* cloth bag Tl *tyuʔ⁴* S *tuʔ³²* Tp *ci¹ta²ʔmiʔ²* Pa *ci¹tuʔ³²* cap Ll *tu:ʔ³* Le *tuʔ³* Qi *tuhʔ⁴* Co *tí²lo:ʔ²*.

As mentioned in §3.4, long checked syllables with *HL or *HLH have remained long in Lealao Chinantec, becoming tones /4/ and /42/, respectively.

77 *hwi:ʔ^{HL} rust, sap Tl *héwʔ⁴* rust (accent not expected) Pa *hwuʔ³²* rust Ll *hwi:ʔ²³* rust, sap Le *fi:ʔ⁴* sap Co *hwí:ʔ¹²* rust.

78 *siu:ʔ^{HLH} edge Tp *ceiʔ³¹* Pa *cyuʔ¹* *hmiy²* bank of river Ll *šö:ʔ²³²* Le *syu:ʔ⁴²*.

4. Implications for Proto Chinantec reconstruction

Having described in summary fashion the development of Lealao Chinantec from the parent Proto Chinantec, we turn now to the consideration of possible implications of the Lealao data for the reconstruction of the parent language.

4.1. Reconstructed tone system. Neither of the regular correspondences Le /32/ ~ Ll /32/ or Le /1/ ~ Ll /31/ is accounted for in the tone system of Proto Chinantec, as currently reconstructed. These correspondences are not widely attested in noun stems, which are the principal base of the original reconstruction. They are frequent, however, in inflected nouns and verbs. It may simply be necessary to posit further tone contrasts. On the other hand, the source may become more clear when the inflection of Proto Chinantec is better understood. It is possible that the tone inflection of the daughter languages is not the result of the substitution of one Proto Chinantec tone for another, but rather of the addition of one tone to another, resulting in tone fusion. If such were to

prove to be the case, the correspondences mentioned above would be the result of such tonal fusion.

4.2. Tone morphophonemics. Tone /2/ in syllables bearing the ballistic accent has a variant which falls sharply, as is characteristic of accented syllables (Rupp 1990). The falling variant of /2/, however, begins at a noticeably higher pitch following a controlled syllable with a basic tone /1/ or tone /1/ derived from tone /2/.

The cognate morphemes in Lalana Chinantec undergo a morphophonemic alternation apparently related to the phonetic shift in Lealao. In most environments, these morphemes have tone /2/ and a syllable-final /h/, which is cognate with the Lealao ballistic accent. These same morphemes, however, have tone /1/ and the final /h/ following /31/, /232/, checked or unchecked long syllables with tone /2/, or short open syllables with tone /2/.

The interchange of pitches, in one case allophonic and in the other morphophonemic, occurs in similar environments in the two languages and may indicate that the parent language, or the language of an intermediate period, had a similar tone interchange. Investigation of the other Chinantec languages at this point may provide further evidence of such an alternation and suggestions regarding its status.

4.3. Syllable-final *ŋ. The nature of the syllable-final consonantal element in Lealao Chinantec has been discussed in §2.4, where it was shown that /y/ follows all vowels except /i/, after which /n/ occurs in at least the speech of some.

The phonological alternation of /-y/ and /-n/ may be interpreted in one of two ways: (a) a single morpheme was marked by a single consonantal element, which was phonetically both palatal and nasal and then was split, or (b) two morphemes with differing functions came to be associated with a common function and to be in complementary distribution.

That there was a single syllable-final consonant (apart from *ʔ) is suggested by the fact that several contemporary Chinantec languages have just one syllable-final element. Lalana marks animate reference by /-n/ and fragmentary evidence from Valle Nacional suggests that /-ŋ/ serves the same function in that language. In addition, vocalic nasalization marks animate reference in several of the northern Chinantec languages. The vowel /-i/ following the main vowel in Quiotepec marks animate reference when the referent itself is not expressed and in Tepetotutla /-j/ follows stems with a nasalized vowel to mark third person when the noun is not expressed.

The evidence from Comaltepec suggests that the second interpretation of the facts of Lealao is the correct one. Comaltepec forms are marked by /-iŋ/ to show third person animate reference. When the animate noun referent is expressed, only /-ŋ/ occurs to mark the animate reference. In other words, STEM + /i/ + /ŋ/ alternates with STEM + ŋ + ANIMATE NOUN. Thus, /-ŋ/ marks animate reference and /-i/ marks animate third person in the absence of the animate noun.

This indicates that Proto Chinantec had at least two morphemes marked by syllable-final elements, a palatal one and a nasal one. Several Chinantec languages retained only one of the two elements. Comaltepec retained both elements as markers of semi-independent morphemes. Lealao retained both elements but in complementary distribution.¹¹

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¹¹For a fuller treatment of syllable-final elements, see Rensch (1989 §4.2).

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