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A PRELIMINARY RECONSTRUCTION OF THE PROTO - MIXTEC TONAL SYSTEM*

Un sistema tonal muy elaborado es una de las características del mixteco. La tonología comparativa muestra una diversificación dialectal muy pronunciada y – a primera vista – parece tener pocas reglas en común. El artículo trata de reconstruir el sistema tonal del protomixteco. Cada morfema tenía una combinación de dos tonos: *alto-alto, *alto-bajo, *bajo-bajo y *bajo-alto. Además, el cierre glotal final, hoy desaparecido en la mayoría de los dialectos, se ha manifestado en cambios de tono. Basándose en esta reconstrucción se esclarecen muchas diferencias dialectales.

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0. Introduction

The tonal system, especially the complexity of tone sandhi rules, is one of the most characteristic features of the Mixtec languages.¹ At first glance, there seem to exist in each dialect arbitrary distinctions between morpheme classes causing tone sandhi of following morphemes and morpheme classes not causing tone sandhi. On the other hand, there is a seeming lack of correspondence between the tonal systems (viz tonemic couplets and tone sandhi rules) of the different dialects. Inner-dialectal splits and dialectal divergence, both loose their arbitrariness in the light of comparative and historical linguistics.

0.1 The Hypothesis

The Mixtec dialects of Ayutla and Santa María Zacatepec preserve a morpheme-final glottal stop. Concerning this glottal stop, Pankratz and Pike (1967: 287 - 288) assumed:

“In fact, the role of morpheme-final and word-final glottal stop in morphotonemics is so important that Ayutla Mixtec may be considered to preserve here an archaic feature of considerable importance to the understanding of the development of Mixtec morphotonemics in its manifold dialectal variations.”

Others – Daly (1973a: 103) for the dialect of Peñoles, Pike and Wistrand (1974: 84) for the dialect of Xayacatlán, Bradley and Josserand (1982) in their reconstruction of Proto-Mixtec – suggested this connection, too. But up to now no comparative work was done to prove it.

It will be shown that this suggestion comes right to the point. There is a high degree of correspondence between Ayutla forms having a final glottal stop and cognate forms from other dialects causing tone sandhi on a following morpheme. The morphotonemic realization of tone sandhi is similar, too. Therefore it is plausible to connect the existence of morphotonemically distinct word classes with the presence or absence of a final glottal stop that has been reconstructed for Proto-Mixtec from non-tonal evidence (Bradley and Josserand 1982).

From the historical point of view, Mixtec tone sandhi might be explained by “floating tone” as in a number of African languages (Schuh 1978: 253 - 254). Proto-Mixtec morpheme-final glottal stop became a tone or tonal glide – such transformation of a final glottal stop into tone is well attested for a large number of tone languages all around the world (Hombert 1978: 92 - 93):

“The effect of a glottal stop on the pitch of the preceding vowel is widely attested. By the sixth century, glottal stops had disappeared in Vietnamese and were replaced by rising tones (Haudricourt 1954, Matisoff 1973a). In the Lolo-Burmese family, Burmese high tone corresponds to Jingpho glottal stop (Maran 1971), and Lahu high rising tone developed through glottal dissimilation (Matisoff 1970). Mei (1970) had shown that Middle Chinese *shang sheng* (rising tone) comes from a final glottal stop.”

The supernumerary character of such a third tone in the tonemic couplet explains its instability. This instable supernumerary tone was phonetically realized either as overlapping onto a following morpheme as “floating tone” in non-prepause position or, in some dialects or dialectal forms, pushing away the second tone of its own tonemic couplet.

0.2 Phonological Inventory of Proto-Mixtec

The canonical structure of Mixtec morphemes is in most cases bisyllabic. The description given by Kenneth Pike (1947: 166 - 169) for the dialect of San Miguel seems to be valid for all dialects (cf. Hunter and Pike 1969: 33, note) and bisyllabic forms have been reconstructed for all Proto-Mixtec (independent) morphemes. As to tone, most descriptions of tonal systems from modern dialects use Pike’s term “tonemic couplet” (Pike 1948: 79). Tonemic couplets will be reconstructed for Proto-Mixtec, too.

Reconstructing the complete tonemic couplet of a morpheme and not the tones syllable per syllable in isolation has first been used in the description of Proto-Mixtecan tones by Longacre (1957: 93 - 112).

The distinction between basic tonemic couplets, i. e. couplets without a modified tone restricted to tone sandhi, and non-basic couplets with modified tone is also taken over from Longacre (1957) – tonemic couplets with a modified tone are unpredictable and can be explained as tone sandhi variants of one of the basic tonemic couplets of Proto-Mixtec, quite the same situation as in Proto-Mixtecan.

Proto-Mixtec has first been reconstructed by Mak and Longacre (1960). Recently a new reconstruction based on a large amount of data collected all over the Mixteca was done by Bradley and Josserand (1982) and Josserand (1983):

CHART 1: PROTO-MIXTEC PHONEMIC INVENTORY

(Josserand 1983: 238 - 276)

A. Phonological units

t	k	k ^w	i	ɨ	u
n _d			e	a	o
s	x		V : Ṿ : Vʔ : Ṿʔ		
l			obligatory tone		
n	y	w			

B. Monomorphemic couplets*

(C)ṾṾ	(C)ṾCṾ
---------	----------

* /ṾṾ/ is phonetically [V•] but should be treated as consisting of two mora. The feature nasalization (Ṿ, Ṿʔ) can only occur in final syllables.

To facilitate comparison of the reconstructed forms given in part in Josserand (1983) and in part done by myself, I will try to follow strictly this system of reconstruction — of course I assume complete responsibility for any deviations or incorrectly reconstructed forms.

1. Reconstruction of Tone

1.1 *Proto-Mixtec Basic Tonemic Couplets*

Longacre (1957) reconstructed three basic tonemic couplets for an older stage of Mixtec: *mid-mid, *mid-low and *low-mid. As to a possible couplet *low-low Longacre (1957: 106) argued:

“Low-low does not occur in M-SM nor 44 in M-SE — therefore presumably PM did not have a *low-low tone pattern.”

But Longacre took into account no more than two dialects (San Miguel el Grande M-SM and San Esteban Atatlahuca M-SE) — therefore, by using a greater number of dialects² a somewhat different and more symmetrical system seems probable:

CHART 2: PROTO-MIXTEC BASIC TONEMIC COUPLETS

*HIGH-HIGH(?)	*LOW-HIGH
*LOW-LOW(?)	*HIGH-LOW





Note that *high corresponds to Longacre’s *mid and *modified (a tone restricted to tone sandhi, see below) to Longacre’s *high. It seems to be preferable to reconstruct only two phonemic tone registers plus a feature tone modification following Daly’s (1973a, 1977) analysis of Peñoles tonal system because of the non-high reflex of the modified tone in a number of dialects (see below). Final glottal stop seems to be restricted to tonemic couplets with identical tones. It is treated as part of the tonemic couplet because it determines tone modification.

The following chart will give the reconstructed tonemic couplets and their reflexes in modern dialects:

PROTO-MIXTEC	*HIGH-HIGH?	*HIGH-HIGH	*HIGH-LOW
Molinos	mid-mid(M)	mid-mid	mid-low
Ocoatepec	mid-mid	mid-mid	mid-low
Jamiltepec	mid-mid	mid-mid	mid-low
Atatlahuca	mid-mid	mid-mid	mid-mid
San Miguel	mid-mid(M)	mid-mid	mid-low
Cacaloztepec	N: mid-low(M)	mid-mid	mid-low
Xayacatlán	N: mid-low(M)	mid-mid	mid-mid
Cahuatache	mid-mid (mid-low)	mid-mid	mid-mid
Silacayoapan (San Jerónimo Progreso)	high-low	mid-mid	mid-mid (kin ship terms: low-low ?)
Mixtepec	CVCV: fml-rlh CV?V: mid-high	mid-mid	mid-low (fml-mid)
Alacatlazala	mid-low (low-mid)	mid-mid	mid-low (mid-mid)
Metlatonoc	mid-low-mid mid-high low-mid	mid-mid	mid-mid (-low)
Ayutla	low-low? (low-high?)	low-low	low-low
Peñoles	low-low(M)	low-low	low-high
Diuxi *	low-low(M)	low-low	low-'low
Jicaltepec *	low-low V: high-high high-low	low-low	mid-mid
Coatzospan *	low-low	low-low	high-high !

PROTO-MIXTEC	*LOW-HIGH	*LOW-LOW?	*LOW-LOW
Molinos	low-mid	low-low(M)	low-low
Ocoatepec	low-mid	low-low	low-low
Jamiltepec	low-mid	low-low	low-low
Atatlahuca	low-mid	mid-low	mid-low
San Miguel	low-mid	mid-low(M)	mid-low
Cacaloztepec	low-mid	low-low(M)	low-low
Xayacatlán	low-mid	low-low(M)	low-low
Cahuatache	low-mid	low-low	low-low
Silacayoapan (San Jerónimo Progreso)	low-mid	low-low	low-low
Mixtepec	low-mid (rlm-low)	CVCV: low-rlh CVV: low-high	low-low
Alacatlazala	low-mid	low-low	low-low
Metlatonoc	low-mid(-low)	N (CVCV): low-low-mid (CVV): mid-low-mid V: mid-mid	
Ayutla	low-low	mid-low?	mid-low
Peñoles	high-low	high-high(M)	high-high
Diuxi	low-'high	high-'high(M)	high-'high
Jicaltepec	high-high (high-mid)	high-high	high-high
Coatzospan	N: !fhl-high V: high-low A: high-high !	high-high	

CHART 3: DIALECTAL REFLEXES OF PROTO-MIXTEC BASIC TONEMIC

<u>COUPLETS</u>	<u>LEGEND</u>
	*final glottal stop → tone modification (M)
	*high-high? → mid-low
	*high-low → mid-mid
	*low-low → mid-low

Special reflexes with:

N	nouns
Num	numerals
V	verbs
A	adjectives
CVCV	} couplet forms
CV?V	
CVV	
()	rare reflex

Tonal glides:

h	high tone
m	mid tone
l	low tone
r	rising
f	falling
rlh	glide <u>r</u> ising from <u>l</u> ow to <u>h</u> igh
fml	glide <u>f</u> alling from <u>m</u> id to <u>l</u> ow
(M)	tone modification

* In Diuxi, Jicaltepec and Coatzospan the distinction between the reflexes of Proto-Mixtec tonemic couplets with and without glottal stop is not sufficiently founded on data.

Note that Diuxi tonemic couplets are given according to the reanalysis of Daly (1978). The apostrophe indicates nonpredictable word-final stress, which is a feature of tone.

The exclamation mark in Coatzospan reflexes indicates a process phoneme causing downstepping terrace tone.

As for *low-high, there is a split into two distinct couplets in several dialects. The non-regular reflexes seem to be arbitrary in each dialect and with no clear correspondence in one of the other dialects.³ I cannot explain this split, although a number of these forms should be analysed as compounds. The same may be true for some reflexes of *high-low, e. g. Mixtepec fml-mid and Alacatlazala mid-mid.⁴

As for *high-high and *low-low, there is evidence for the influence of final glottal stop on the development of tonemic couplets. Forms without such glottal stop tend to have a modern reflex of the Proto-Mixtec tonemic couplet distinct from that of forms with Proto-Mixtec final glottal stop. The dialects Mixtepec, Alacatlazala and Metlatonoc mostly show reflexes of *high-high? and *low-low? having a final high tone or tone rising to high. Ayutla has at least in part a reflex low-high? of *high-high? and in other dialects final high tone occurs in rare and non-predictable cases.⁵ Note that this split is clearly evident for *high-high? but only in part for *low-low?.

The distinction of [+ modify] (perturbing power) vs. [- modify] in Peñoles and Diuxi seems to correspond to the presence or absence of Proto-Mixtec final glottal stop.⁶ The split of some couplets into distinct perturbation classes in Jicaltepec seems to be related to this Proto-Mixtec feature as well, although the partial merging of some Proto-Mixtec couplets (basic and non-basic) in this dialect complicates the analysis. Jicaltepec morpheme classes high-high (sandhi class I) and low-low (sandhi class I) resulting from Proto-Mixtec *low-low? and *high-high? respectively contrast with high-high (sandhi class III) and low-low (sandhi class II) resulting from Proto-Mixtec *low-low and *high-high.⁷

Coatzospan seems to merge *high-high? and *high-high as low-low, and *low-low? and *low-low as high-high (isolation variant high-rlh).⁸

A number of dialectal reflexes should be explained by older subphonemic variants of tonemic couplets. The reflexes San Miguel and Atatlahuca mid-low and Metlatonoc mid-low(-mid) of *low-low show that this Proto-Mixtec tonemic couplet had no plain but a falling contour. The same is true as to the reflexes Xayacatlán and Cacaloztepec mid-low of *high-high? and, in a number of dialects, mid-mid of *high-low, the contour in both cases being [mid-mid-low].

In some dialects there is a tendency to differentiate the reflexes of verbal and nominal forms and to reduce the number of distinctive tonemic couplets of verbs. This could be the result of marking verbal aspect mainly by tone in these dialects, but there are not enough data to give clear evidence. The possible influence of morpheme-structure and segmental phonemes on the tonemic couplet is another unsolved problem. Lexical fields, too, may be of some importance, e. g. numerals all have a tonemic

couplet *low-low (the number four *low-low?), some animal names and several kinship terms have either *high-low or *low-high.⁹

There is a high degree of correspondence between the reflexes in the dialects San Miguel, Atlatlahuca, Ocotepec, Molinos, Cacaloztepec, Xayacatlán, Chayuco, Silacayoapan, Mixtepec, Alacatlazala, Cahuatache and Metlatonoc. These dialects form dialect area A.

The dialects Peñoles, Jicaltepec, Diuxi and Coatzospan show a clearly distinct system. The reflex of *low-low is at a higher level in the register than that of *high-high. The couplets changed places. These dialects will be called area B.

The dialect Ayutla has an intermediate position between area A and B.

This split into two distinct dialect areas with tone couplets reversed in the register is a problem which will be discussed in 1.4.

1.2 Proto-Mixtec Non-basic Tonemic Couplets

Non-basic tonemic couplets are characterized by the presence of at least one modified tone. Modified tone differs from the unmodified ones as follows:

a) In a large number of dialects, modified tone is at a higher level than every unmodified tone and there is a merger of modified low and modified high. This is the case in dialect area A and in Ayutla.

b) In the other dialects (i. e. area B) tone modification lowers high to mid and mid to low tone. The derived couplets are characterized by at least one lowered tone and their formation follows more complicated rules. But this is a historical statement – judging from the published data it seems to be difficult to distinguish basic tonemic couplets and non-basic ones phonetically in these dialects.

There will be no reconstruction of Proto-Mixtec morphemes with a non-basic tonemic couplet (this seems to be misleading in my opinion) but only of forms having a sandhi variant of one of the basic tonemic couplets. This I practice because I assume that most, if not all non-basic tonemic couplets in modern dialects have been caused by regular tone sandhi at an older stage of Mixtec. This older stage might have been in some cases, but not necessarily, Proto-Mixtec and, rarely, even Proto-Mixtecan. Being made up in most cases of compound words, they lost or fused their first element (the one producing tone sandhi) and became, as result, a seemingly non-composite word with canonical bisyllabic form. The only distinction to non-composite morphemes is the preserved tone sandhi caused by the lost or fused first element (Dürr 1984). I offer the following arguments and facts in favor of this hypothesis:

1) In most dialects of area A, non-basic tonemic couplets cannot be perturbed by regular tone sandhi, or at least have restricted or special tone sandhi. (They cannot be perturbed because they already are perturbed!)

2) The reflexes of the non-basic tonemic couplet of a given form are not homogenous enough to be derived from one peculiar Proto-Mixtec tonemic couplet reconstructed as non-basic. The postulation of shortened compound forms could explain this inconsistency – the individual non-basic couplet is the result of any older stage of dialectal tone sandhi. Such a form, whether shortened or not, followed the changes of dialectal sandhi rules for a long time, up to the moment it became frozen and obsolete.¹⁰

3) A great number of non-basic tonemic couplets are to be found in words which might be explained through evident compounds being not or only partially reduced alternate forms in the same dialect or through forms of other dialects (Dürr 1984).

4) At least Ayutla shows a special, optionally progressive or regressive tone sandhi involving morphemes with non-basic tonemic couplets (Pankratz and Pike 1967: 297):

“Tone sequences 31, 331, 313, and 321 which are Class B act morphotonemically as though preceded by a proclitic with tone but no segmental phonemes.”

This proclitic should be explained as the lost or fused first element of the compound.

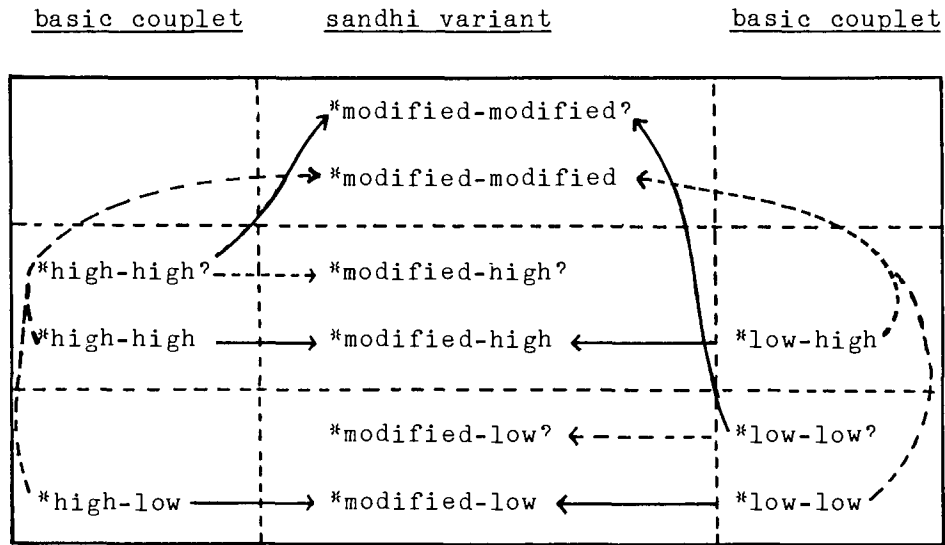
Non-basic tonemic couplets therefore are to be explained by tone sandhi rules and will be discussed in the following paragraph.

1.3 Proto-Mixtec Tone Sandhi

Proto-Mixtec tone sandhi is based on the fact that in non-prepause position morpheme-final glottal stop became a “floating” tone modifying its environment. Proto-Mixtec had two different forms of tone sandhi:

1) Following a non-prepause morpheme ending with a glottal stop there was a regular perturbation of basic tonemic couplets changing the couplet to a derived one having at least one modified tone. In this position forms without a final glottal stop had tone sandhi variants with their first tone altered, the second unaltered, i. e. tone modification lapped over onto the first syllable of the following morpheme and created a modified tone.¹¹ Forms with a final glottal stop might have had the same change, although the more frequent sandhi variant had both basic tones changed to modified tones, i. e. the modifying power of the final glottal stop was realized as modification of the second tone of its own tonemic couplet, and not as

CHART 4: PROTO-MIXTEC TONE SANDHI



modification of the first tone of the following morpheme. I cannot explain this ambivalence of *high-high? and *low-low? concerning their sandhi variants – in some cases there is evidence even of two modified tones in forms not having final glottal stop.

LEGEND (CHART 5)

- H high tone
- M mid tone
- 3 intermediate tone between mid and low (Atatlahuca)
- L low tone
- > regular sandhi rule
- > special sandhi rule (e.g. optional or restricted to special constructions)

* The analysis of Atatlahuca tone sandhi follows Alexander (1980). Mak (1953) differs in some respect.

CHART 5: COMPARISON OF DIALECTAL TONE SANDHI TO HIGH (AREA A)

	non-perturbable tonemic couplets	basic tonemic couplets	sandhi variants	basic tonemic couplets
<u>San Miguel</u>	HH MH HM HL	MM ML	HH MH HM HL	LH LM
<u>Molinos</u>	HH MH HM HL	MM ML	HH MH HM HL	LH LM LL
<u>Cacaloztepec</u>	HH HM HL	MH MM ML	HH HM HL	LH LM LL
<u>Xayacatlán</u>	HH HM HL	MH MM ML	HH MH HM HL	LH LM LL
<u>Ocotepec</u>	HH HM HL	MH MM ML	HH HLH HM HLM HL	LH LM LL
<u>Atatlahuca*</u>	HH (MH) HM (MM) H3 ~ H3M HL	MH MM ML	HH H3H HM H3M HL	LH LHM LM
<u>Metlatonoc</u>	HH MH LH HM HL	MM ML(M)	HM HL(M)	(M)LM LL(M)
<u>Ayutla</u>	HH MH (LH) HL	ML	HHL MH HL ML	LH LL

2) In special, close-knit modifying constructions (mainly noun + modifying noun, adjective or verb), a special tone perturbation of the tonemic couplet of the modifying morpheme to *modified-modified (rarely to *modified-high or *modified-low) took place in contrast to regular tone sandhi in the same way as described by Pike (1948: 82 - 87) for the dialect San Miguel el Grande. This tone perturbation occurred in these special syntactic constructions whether the first morpheme ended with a glottal stop or not. This second form of tone sandhi might be explained by deletion of *xàà? “relative marker” combined with retained tone sandhi of the following modifier.

For practical purpose, I will discuss in the following summary of dialectal sandhi systems areas A and B separately.

AREA A (inclusive Ayutla): Morphemes causing regular tone sandhi to high in San Miguel, Molinos, Cacaloztepec, Xayacatlán, Metlatonoc and Ayutla, or special tone sandhi to high in Atlatlahuca and Ocoatepec have had final glottal stop in Proto-Mixtec. Dialects and dialectal forms not having this perturbing power but being also a reflex of a Proto-Mixtec morpheme with final glottal stop have in most cases final high tone or a final tone rising to high. The effect of the supernumerary tone was realized on the last syllable of its own tonemic couplet and therefore no longer could shift onto the following morpheme.

As can be seen from chart 5 the sandhi rules being the result of Proto-Mixtec final glottal stop vary only in detail – area A shows but minor variants of the Proto-Mixtec tone sandhi system.

Most other sandhi rules may be explained through the tonemic couplets of Proto-Mixtec or another older stage of Mixtec dialect evolution. Mak (1953: 92) suggested that Atlatlahuca morphemes having a lowering influence onto the tones of a following morpheme historically ended on low tone, e. g. the subclass of Atlatlahuca mid-mid with lowering influence goes back to Proto-Mixtec *high-low. The tonemic couplet mid-mid(-low) in Metlatonoc is the regular reflex of Proto-Mixtec *high-low and, alike, causes tone sandhi to low.

Some of these sandhi rules (and reflexes of Proto-Mixtec) should be considered as the result of older subphonemic variants. In Ocoatepec (Mak 1958: 70) and in Xayacatlán (Pike and Wistrand 1974: 84) a low tone following another low tone in a couplet has a lower allotone. To suggest such falling of tone in couplet *low-low(?) for an older stage might explain the reflexes San Miguel and Atlatlahuca mid-low, Metlatonoc mid-low(-mid), Ayutla mid-low(?) and tone sandhi rules changing the reflex of *low-low to mid-low in Metlatonoc and Molinos. The reflexes Xayacatlán and Cacaloztepec mid-low(modify) of *high-high?, the rule changing Xayacatlán mid-low to high-mid and the regressive change of

Cacaloztepec mid-low (with following perturbation to high) to mid-mid show that *high-high? must have had a phonetic realization [mid-mid-low] at least in the ancestor dialect of Xayacatlán and Cacaloztepec. The rule changing mid-low to mid-mid after preceding low tone in Cacaloztepec and the reflex mid-mid of *high-low in other dialects show that *high-low at least in some dialects had the same phonetic realization [mid-mid-low].

Non-basic tonemic couplets high-mid and high-low being reflexes of older sandhi variants *modified-high and *modified-low are rare. Couplets high-high, mid-high, low-high, and, in some dialects, mid-mid and low-mid, too, are reflexes of *modified-modified. The lowering of a number of dialectal reflexes of *modified-modified to low-high and mid-high in some environments, probably following low tone,¹² seems to be an old morphotonemic rule, maybe even of Proto-Mixtec. Mid-mid and low-mid have been lowered in a second step from mid-high and low-high in Molinos and Xayacatlán.

Mainly a phenomena to be found in non-basic tonemic couplets, but not restricted to them, is, that a morpheme may lose its perturbing power if it has become perturbed itself.

AREA B: The suggestions concerning area B are based on only a few forms per dialect and therefore are somewhat speculative. Peñoles tone modification at least seems to be a reflex of Proto-Mixtec final glottal stop, as Daly (1973a: 104) already suggested. There are some forms as hints that Diuxi and Jicaltepec tone sandhi with lowering influence may also be a reflex of Proto-Mixtec final glottal stop and that the other sandhi classes are to be explained as reflexes of the Proto-Mixtec basic tonemic couplets seemingly merged. The merging of the reflexes of the Proto-Mixtec basic tonemic couplets and the lack of a clear-cut division between basic tonemic couplets and non-basic ones, in combination with insufficient data does not allow a correlation of sandhi classes with reconstructed tonemic couplets. Finally, Coatzacoapan is the only dialect that does not seem to fit in with these suggestions.

1.4 Problems Unsolved

My reconstruction of tone and the reconstruction of final glottal stop done by Bradley and Josserand (1982) does not fit well in Longacre's and Rensch's reconstructions of Proto-Mixtecan and Proto-Otomanguean. But these reconstructions are not sufficiently founded with data on Mixtec, and therefore there may be at least some truth in my suggestions. It would be of great use to have a new look at Proto-Mixtecan and Proto-Otomanguean tones, laryngals and tone sandhi when better reconstructions of the peculiar languages and language families become available.¹³ The following problems remain unsolved:

Problem 1: There is no clear correspondence between Proto-Mixtec final glottal stop and the laryngals reconstructed by Longacre (1957) for Proto-Mixtecan and Rensch (1976) for Proto-Otomanguean.

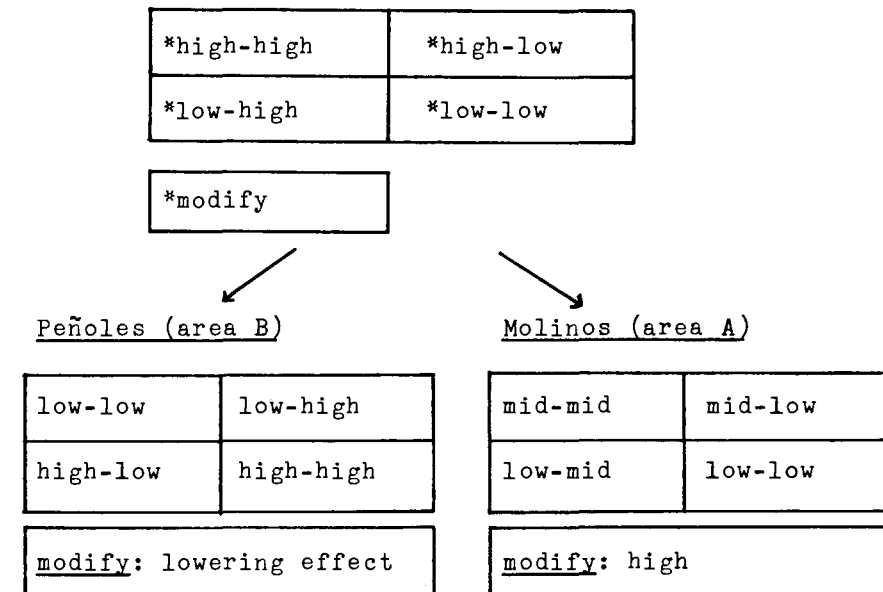
The evolution of Proto-Otomanguean laryngals into modern Mixtec as described by Rensch (1976: 45) does not fit into the reconstruction of Proto-Mixtec final glottal stop. Rensch explained the morpheme-pattern *CVV of Proto-Mixtec as being derived from Proto-Mixtecan *CVh and Proto-Mixtec *CV[?]V from Proto-Mixtecan *CV[?] – therefore a Proto-Mixtec *CVV[?] or *CV[?]V[?] would have had two Proto-Mixtecan final laryngals – but see Rensch's distinction between Proto-Otomanguean *CVH and *HCV and his proposal of *HCVH (H means laryngal h or ? here). A quite reasonable suggestion for further investigation is given by Josserand (1983: 460):¹⁴

“Some pre-Proto-Mixtecan patterns are fairly clear, such as the development of older CV morphemes to a couplet shape, either by lengthening the vowel to a structural CVV canon, or by combining such CV forms with other morphemes, to form CVCV canons. It seems that many such old CV roots, either Proto-Otomanguean or Proto-Mixtecan, developed into CVCV forms by Proto-Mixtec times, and the old CV root is usually the ultimate syllable of the couplet.”

Problem 2: Although there is clear inner-Mixtec evidence for the distinction of Proto-Mixtec *high-low and *low-low, the embedding of these two couplet forms into Proto-Mixtecan is not quite clear: Proto-Mixtecan *33 becomes in most cases Proto-Mixtec *low-low, but Proto-Mixtec *high-low may come from Proto-Mixtecan *mid-3, *mid-low or even *33.¹⁵

Problem 3: The contrast between the two distinct dialect areas leads to another problem of this study. Tones have been inverted in the tonal register in the two areas:

CHART 6: CORRESPONDENCES OF PROTO-MIXTEC TONEMIC COUPLETS IN DIALECTS PEÑOLES AND MOLINOS



This striking development leads to the problem how to explain such an inversion of tone by historical tonology. The suggestion of a rule “feature reversal” would violate the principle of non-arbitrariness. But note that Dwyer (1981) reports a similar diachronic development of tonal inversion [α high] > [-α high] for Loma, a Southwestern Mande language. Proto-Bandi-Loma tones high, non-high and falling correspond to Loma tones non-high, high and rising. A possible explanation Dwyer refers to would be via the generalization of a rule characterizing a particular linguistic style (e. g. courtship, ritual or play language). For the Mixtec case another, more traditional explanation might be via allophonic glides of the Proto-Mixtec tonemic couplets – but such a sophisticated analysis should be based on more data, especially for area B.

Another problem is that in my reconstruction the innovation is attributed to the dialects of area B, i. e. to those dialects being peripheral and lacking contact. Coatzospan, the northeastern outpost of Mixtec, lies within Mazatec territory. Diuxi and Peñoles are located in the eastern Alta, Jicaltepec in the western Costa. Therefore one would expect that

these distant dialects preserve Proto-Mixtec conditions quite well. Although I consider this as quite probable, I have not used it in the reconstruction of Proto-Mixtec for the following reasons:

1) Any argument based on geographical distribution is highly speculative for there are many more dialects to consider (mainly from the north-eastern Alta and from the Costa) than those being the base of this study. Tonal isoglosses should be compared with the isoglosses and the dialect areas given in Josserand (1983).

2) From the descriptive point of view, too, dialect area B is not well enough documented – four dialects vs. thirteen of area A. Moreover the number of cognate forms is not sufficient to establish reliable correspondence. They cannot give but a vague idea.

3) A reanalysis of Proto-Mixtec with inverted tones would have further implications as to Proto-Mixtecan tones and even Proto-Otomanguean tones. Such an enterprise would be far beyond the scope of this study, although such work would be useful because Proto-Mixtecan tones are based only on two Mixtec dialects (of area A) and one dialect each of Cuicatec and Trique.

Because of these problems, I preferred to reconstruct Proto-Mixtec depending heavily on Mixtec area A evidence although I am quite aware that the reconstruction may not be one of Proto-Mixtec but of Proto-Area A-Mixtec. Therefore this brief study can't give but a glance on Proto-Mixtec historical tonology. Its preliminary character should be overcome by the integration of data from more dialects.

2. Cognate Sets

Data have been taken exclusively from published sources, transcriptions have been standardized according to phonetic symbols used in Mesoamerican linguistics.¹⁶ In general, the transcription is phonemic as analysed in the source, but in a few cases predictable phonetic details, e. g. nasalization of vowels, have been indicated to facilitate comparison.

The arrangement of cognate forms is the same as in K. Josserand (1983) and is given in the following list, which also includes the abbreviations used in the cognate lists and the works consulted for each dialect:

NORTHEASTERN ALTA

- 1) *Diuxi* (Diu): Daly (1978), Pike and Oram (1976)
- 2) *Peñoles* (Pe): Daly (1973, 1973a, 1977)
- 3) *Coatzacoapan* (Coa): Pike and Small (1974)

CENTRAL ALTA

- 4) *Molinos* (Mol): Hunter and Pike (1969)
- 5) *Ocotepec* (Oco): Mak (1958)
- 6) *Atatlahuca* (Ata): Alexander (1980), Mak (1953)
- 7) *San Miguel el Grande* (SM): Dyk and Stoudt (1965), Pike (1947, 1948)

NORTHERN BAJA

- 8) *Cacaloztepec* (Cac): Pike and Cowan (1967)
- 9) *Xayacatlán* (Xay): Pike and Wistrand (1974)

SOUTHERN BAJA

- 10) *Ayutla* (Ay): Pankratz and Pike (1967)
- 11) *Alacatlazala* (Ala): Zylstra (1980)
- 12) *Metlatonoc* (Met): Overholt (1961)
- 13) *Cahuatache* (Cah): Schultze (1938)
- 14) *Mixtepec* (Mix): Pike and Ibach (1978)
- 15) *Silacayoapan (pueblo San Jerónimo Progreso)* (Sil): North and Shields (1977)

COSTA

- 16) *Jicaltepec* (Jic): Bradley (1970)
- 17) *Jamiltepec (pueblo Chayuco)* (Jam): Pensinger (1974)

Additionally, for a number of dialects kinship terms have been taken from Merrifield (1981), and, in a few sets, gaps have been filled with those forms from Josserand (1983) marked for tone.

The following list contains 110 cognate sets.¹⁷ Of these, 51 sets have been reconstructed by myself according to the system used by Josserand (1983), the other reconstructed forms are taken from Josserand (1983) and only tone has been added.

TONEMIC COUPLETS *HIGH-HIGH?

PM	1) *kítíʔ	2) *káxíʔ	3) * ⁿ dútíʔ	4) * ⁿ dutéʔ ¹⁸⁵	* ⁿ dáʔáʔ	6) *sáʔwǎʔ	7) *yútúʔ	8) *yúkúʔ
	"animal"	"to eat"	"beans"	"water"	"hand"	"clothes"	"tree"	"mountain"
Diu	kítì	---	---	---	---	---	---	---
Pe	kítì	káʃì	ⁿ dùčì	ⁿ dùtè	ⁿ dáʔà	---	žùtù	žùkù
Coa	---	káʔsí	ⁿ dùʔɸì	ⁿ dùʔtè	ⁿ dáʔà	ǎʔmǎ	---	---
Mol	kítì(M)	kāā(M)	ⁿ dūčì(M)	ⁿ dūtē(M)	ⁿ dāʔā(M)	sāʔmā(M)	žūtū(M)	žūkū(M)
Oco	kítì	---	---	ⁿ dūtē	ⁿ dāʔá	sāʔmā	ñūtū	žūkū
Ata	kítì	kāxì	ⁿ dūčì	ⁿ dūtē	ⁿ dāʔā	sāʔmā	žūNū	žūkū
SM	kítì(M)	kāxì(M)	ⁿ dūčì(M)	ⁿ dūčā(M)	ⁿ dāʔā(M)	sāʔmā(M)	žūnū(M)	žūkū(M)
Cac	kítì(M)	kāà(M)	ⁿ dūčì(M)	---	---	ǎʔmā(M)	žítò	---
Xay	kìsì(M)	---	---	---	ⁿ dāʔà(M)	ǎʔmā(M)	---	---
Ay	---	káʃìʔ	ⁿ dúčìʔ	(ti k ^w ii)	ⁿ dáʔáʔ	sáʔmáʔ	ìtúʔ	---
Ala	---	---	ⁿ dūčù	---	ⁿ dāʔā	---	---	---
Met	kítì	káʃì	---	---	ⁿ dāʔā	---	yútú	---
Cah	kítì	káʃì	ⁿ dūčù	(ta k ^w iyi)	ⁿ dāʔā	---	yìtnò	yúkù
Mix	---	---	---	---	ⁿ dāʔá	sāʔmā	---	---
Sil	kítì	káʃì	ⁿ dúčù	---	ⁿ dáʔà	háʔmā	žítò	žúkù
Jic	kítì	káčì	---	ⁿ dùtā	ⁿ dáʔà	sáʔmā	yùtù	---
Jam	kítì	---	ⁿ dút ^y ì	---	---	---	---	yūkù

TONEMIC COUPLETS *HIGH-HIGH? (continued)

PM	9) *yúwíʔ	10) *yúʔúʔ	11) *yáʔkǎʔ	12) *yáʔáʔ	13) *yáʔǎʔ	14) *yóʔóʔ	15) *ítíʔ
	"straw mat"	"mouth"	"bone"	"chile"	"woman"	"rope"	"road"
Diu	---	---	žìkǎ	žáʔà	---	---	---
Pe	žùù	žùʔù	žìkǎ	žáʔà	---	žòʔò	ìčì
Coa	---	žùʔù	---	žáʔà	---	žòʔò	---
Mol	---	žūʔū(M)	---	žāʔā(M)	ñǎʔǎ	žòʔò	ìčì
Oco	žūū	žūʔú	---	---	---	---	ìčì
Ata	žūū	žūʔū	žìkǎ	žāʔā	ñǎʔǎ	žòʔò	ìčì
SM	žūū(M)	žūʔū(M)	žìkǎ(M)	žāʔā(M)	ñǎʔǎ(M)	žòʔò(M)	ìčì(M)
Cac	žūū(M)	žūʔù(M)	---	---	---	žòʔò	---
Xay	yūì	---	---	---	ñǎʔǎ(M)	yòʔò	---
Ay	yìwìʔ	yùʔúʔ	ìkìʔ	---	---	---	---
Ala	---	yūʔù	---	---	---	---	---
Met	yūbì	yùʔū	ìkì	---	---	yòʔó	ìčì
Cah	yìwì	yūʔū	yìkì	yāʔā	ñāʔà	---	yìčì
Mix	yūbì	yūʔú	---	yāʔá	ñǎʔǎ	yòʔó	---
Sil	---	žúʔù	---	žáʔà	ñǎʔǎ	žòʔò	ìčì
Jic	yùbì	---	---	---	ñǎʔǎ	yòʔò	ìtì
Jam	yūū	yūʔū	---	---	---	yòʔò	ìt ^y ì

TONEMIC COUPLETS *HIGH-HIGH

	PM 16) *tíyǒ	17) *tóó	18) *kíxí	19) *kúnú	20) *kúwí	21) *kátá	22) *kákú	23) *ká?wǐ
	"work"	"handspan"	"to come"	"to run"	"to be"	"to sing"	"to be born"	"to burn"
Diu	---	---	---	---	---	---	---	---
Pe	ǎǐǐ	tòò	kìšì	kùnù	kùù	kàtà	kákù	kà?mì
Coa	ǎǐǐ	---	---	---	kùù	kà?tà	---	kà?mǐ
Mol	tǐǐ	---	kīī	kūnū	kūū	kātā	---	---
Oco	tǐǐ	tōō	---	---	---	kātā	kākū	---
Ata	Nǐǐ	tōō	kīxī	kūnū	kūū	kātā	kākū	kā?mū
SM	tǐǐ	tōō	kīī	kūnū	kūū	kātā	kākū	kā?mū
Cac	ǎǐǐ	---	kīšī	---	---	kātā	---	kā?mǐ
Xay	ǎǐǐ	tōō	---	---	kūū	---	---	---
Ay	ǎǐǐ	tòò	kìšì	kùnù	---	---	---	---
Ala	ǎǐǐ	---	---	---	---	---	---	---
Met	---	---	---	kūnū	kūū	kātā	---	---
Cah	ǎǐǐ	---	kīsī ¹⁹	---	---	---	kákū ¹⁹	kā?mī
Mix	ǎǐǐ	---	---	---	---	---	---	---
Sil	ǎǐǐ	---	---	---	kūū	kātā	---	---
Jic	---	---	kíǐ	kúnú	---	---	---	---
Jam	---	---	---	---	---	---	---	---

TONEMIC COUPLETS *HIGH-HIGH (continued)

	PM 24) *kótó	25) *kó'ó	26) *k'áǐ	27) *wítǐ	28) *wé'yí	29) *íkú	30) *ǐǐ
	"to look"	"to drink"	"to buy"	"now"	"house"	"yesterday"	"one"
Diu	---	---	---	---	---	---	ǐǐ
Pe	kòtò	kò'ò	k'áǐ	ǐtǐ	bè'è	ìkù	ǐǐ
Coa	kò'tò	kò'ò	k'áǐ	---	ǐ'ì	---	---
Mol	kòtò	kò'ò	k'áǐ	ǐtǐ	bè'è	ìkū	ǐǐ
Oco	---	---	---	---	bè'è	ìkū	---
Ata	kòtò	kò'ò	k'áǐ	ǐNā	bè'è	ìkū	ǐǐ
SM	kòtò	kò'ò	k'áǐ	ǐnā/ǐtǐ	bè'è	ìkū(M)	ǐǐ
Cac	---	---	---	ǐǐ	bè'è	---	ǐǐ
Xay	---	---	---	ǐǐ	bè'è	ìkū	ǐǐ
Ay	kòtò	---	---	wítǐ	wì'è	---	ǐǐ
Ala	---	---	---	ǐtǐ	bè'è	---	---
Met	kòtò	---	---	---	bè'è	---	ǐǐ
Cah	---	kò'ò	---	wítǐ	wè'è	---	ǐǐ
Mix	---	---	---	---	bè'è	---	ǐǐ
Sil	---	---	k'áǐ	ǐtǐ	bè'è	---	ǐǐ
Jic	---	---	---	ǐtǐ	bè'è	ìkù	ǐǐ
Jam	---	---	---	ǐtǐ	bè'è	---	ǐǐ

TONEMIC COUPLETS *HIGH-LOW

PM	31) *tútù "paper"	32) *téyù "stool"	33) *kákà "lime"	34) *sítò "uncle"	35) *sísì "aunt"	36) *lá'wà "frog"	37) *láá "bird"	38) *nàwà "wall"
Diu ²⁰	tú'tú	---	---	'dítò	'dídí	---	---	---
Pe	tùtù	tèžú	kákà	dító	dídí	là'wá	tí-láá	---
Coa ²¹	tú'wú!	---	---	dító!	dídí!	ɸà'wá!	láá!	---
Mol	tūtù	---	---	stōò	sísì	---	---	---
Oco	---	---	---	šítò	šísì	---	sāà	---
Ata	tūtū	---	kākā	stōō	sīsī	---	sāā	---
SM	tūtù	tēžù	kákà	stōò	šìlì	sā'wà	sāà	nāmà
Cac	tūtù	tēì	---	dītò	dídì	---	tì-lāà	nāmà
Xay	tūtū	---	---	dītō	dídī	---	---	nāmā
Ay	tùtù	---	kákà	šítò	šísì	---	sāà	nāmà
Ala	---	tāyì	---	---	---	---	---	---
Met	tūtū	t ^v āyù	kākā`	šítò	šísì	---	sāā	nāmà
Cah	---	tāyī	kākā	sītō	sīsī	---	sāá	---
Mix	tūtù	---	kákà	šítò	---	sā'wà	---	---
Sil	tūtū	---	---	hítò	hìhì	lá'wà	lāā	---
Jic	tūtū	tāyū	kākā	šītō	šísì	sā'wà	sāā	nāmā
Jam	tūtù	tēì	---	---	---	---	---	nāmà

TONEMIC COUPLETS *HIGH-LOW (continued)

PM	39) *yúyù "town"	40) *yéni "brother"	41) *yáwì "hole"	42) *ítà "flower"	43) *ísù "deer"	44) *ínì "inside"	45) *ínà "dog"
Diu	---	'nànì	---	---	---	---	---
Pe	ñùú	ñàní	žàú	ítá	ídú	ìní	íná
Coa	ñyú!	éńí!	šábi	(làà)	ídú! "horse"	---	t-ìńq!
Mol	ñùù	---	---	ītà	īsù	ìní	ínà
Oco	ñūù	ñānì	---	ītà	īsù	ìní	t-īnà
Ata	ñūū	ñānī	žā(ə)ū	ītā	---	īnī	īnā
SM	ñūù	ñānì	žāù	ītà	īsù	ìní	ínà
Cac	ñq̄q̄	ñāñì	---	---	---	---	t-ìńq̄
Xay	---	ñānī	yābi	---	ídū "horse"	---	sì-īnà
Ay	ñùù	ñànì	---	ítà	---	ìní	---
Ala	ñq̄q̄	---	yābi	---	yūsū	---	īnq̄
Met	---	yānī	---	ītā	---	īnī	---
Cah	ñq̄q̄	ñānī	yāwī	yītā	tn-ūsū	īnī	(ñ)īnā
Mix	ñūù	---	yābi	ītà	---	---	t-īnā
Sil	ñūū	ñànì	žábì	---	ūhū	īnī	t-īnā
Jic	ñyūyū	---	---	ītā	---	---	īnā
Jam	ñūù	---	yābi	ītà	---	---	---

TONEMIC COUPLETS *LOW-HIGH

PM	46) *tìxí "stomach"	47) *tàyé "man"	48) *tò'ó "word"	49) *kàsí "clay pot"	50) *kàá "metal"	51) *kòyó "meat"	52) *k ^w à'á "cross-sex sibling"	53) * ⁿ dò'ó "adobe"
Diu	---	---	---	---	---	---	kú'á	---
Pe	(šítí)	téè	tú'ú	kíáí	---	kùñú	kú'á	ⁿ dò'ò
Coa	---	---	tù'ú !	kíáí !	kàá !	kùñú !	---	ⁿ dò'ó !
Mol	čīī	tèē	---	kīsī	kàā	---	k ^w à'ā	---
Oco	čihī	tèē	---	---	kàā	kùñū	k ^w à'ā	---
Ata	čihī	tèē	Nù'ú	kīsī	kàā	kùñū	k ^w à'ā	---
SM	čīī	čāā	tù'ú	kīsī	kàā	kùñū	k ^w à'ā	ⁿ dò'ò
Cac	tīšī	---	---	kīdī	kàā	kòñq	---	---
Xay	---	t ^v āā	---	---	kàā	---	kù'ā	ⁿ dò'ò
Ay	---	t ^v āā	tù'ú	kīsī	kàā	---	---	ⁿ dò'ò
Ala	---	---	---	kīsī	---	kùñq	---	ⁿ dò'ò
Met	tīšī	t ^v āā	tù'ú	kīsī	kàā	kùñū	kū'ā	---
Cah	tīšī	---	tnq'q	---	kàā	kùñū	---	ⁿ dò'ò
Mix	tīčī	čāā	tù'ú	kīsī	kàā	---	---	ⁿ dò'ò
Sil	tīšī	tāā	tù'ú	---	kàā	---	k ^v à'ā	ⁿ dò'ò
Jic	tíčí	---	tú'ú	kísí	kāā	---	---	ⁿ dò'ò
Jam	---	---	tù'ú	---	---	---	kù'ā	ⁿ dò'ò

TONEMIC COUPLETS *LOW-HIGH (continued)

PM	54) *sà'yí "child"	55) *xènú "sibling's wife"	56) *lò'ó "ear"	57) * ⁿ dò'ó "tooth"	58) *yùté "river"	59) *wìxí "cold"	60) *wà'á "good"
Diu	á'á'zá	šā'nú	à'ò'ó	---	---	---	à'á'á
Pe	á'è	sánù	á'ò'ò	nú'ú	žútè	bíší	á'á'á
Coa	í'šá !	ènú !	---	nù'ú !	---	bí'šš	á'á'á
Mol	sè'ē	---	---	nù'ú	žútè	ìxí	à'á'ā
Oco	sè'ē	xànū	---	---	žútè	---	à'á'ā
Ata	sè'ē	xènū	sò'ò	Nù'ú	žútè	mìxí	à'á'ā
SM	sè'ē	xànū	sò'ò	nù'ú	žùčā	ìxí	à'á'ā
Cac	à'è'ē	---	à'ò'ò	nq'q	---	ìšī	à'á'ā
Xay	à'è'ē	sànū	---	---	---	ìší	à'á'ā
Ay	sī'è	šànù	sò'ò	---	---	wìší	wà'á
Ala	---	---	sò'ò	---	---	ìšī	à'á'ā
Met	sē'ē	sānū	---	---	ít ^v ā	ìší	à'á'ā
Cah	sā'yā	šānō	sò'ò	nq'q	yūtā	wìší	wā'ā
Mix	sè'ē	---	---	---	yùčā	ìčī	à'á'ā
Sil	hà'žī	sànù	---	---	žūtā	ìšī	à'á'ā
Jic	sé'é	čānū	só'ó	---	yútā	---	á'á'á
Jam	θè'ē	---	---	---	---	---	à'á'ā

TONEMIC COUPLETS *LOW-LOW?

PM	61) *tātā?	62) *kàwǎ?	63) *kàwǎ?	64) *kàti?	65) *kòò?	66) * ⁿ dìxè?	67) * ⁿ dòò?	68) *sità?
	"medicine"	"four"	"day"	"cotton"	"snake"	"sandal"	"cane"	"tortilla"
Diu	tá'tnǎ	kǒ'ǒ	kǎ'ú	---	---	---	ⁿ dó'ó	---
Pe	---	kúmí	---	---	kóó	---	(tù-zòò)	áitá
Coa	---	kǎmǎ	---	ká'ǎ	kóó	ⁿ dí'ǎ	---	í'tá
Mol	tātā	kǔyǔ(M)	kìbì	kàčì	kòò(M)	---	---	stāà(M)
Oco	tātā	kùmì	---	---	---	---	---	šitá
Ata	tānà	kǔyǔ	kǎbǎ	---	kōò	ⁿ dìxè	ⁿ dōò	stāà
SM	tānà	kǔyǔ(M)	kǎbǎ	kāčì	kōò(M)	ⁿ dìxǎ(M)	ⁿ dōò	stāà(M)
Cac	tātā(M)	kòmǎ(M)	---	kàčì	kòò	ⁿ dìsà	ⁿ dòò(M)	áitá(M)
Xay	---	kùmì(M)	---	---	kòò	ⁿ dìsǎ	---	áitá(M)
Ay	---	kúmí?	---	kāčì?	kōò?	ⁿ dìsǎ?	---	štā'?
Ala	---	---	kìbì	---	kòò	---	---	sità
Met	tātā(ǎ)(M)	kùmī(M)	kìbì(ī)	---	kōò(M)	---	---	šitá
Cah	---	kùmī	kìwì	kàčì	---	ⁿ dùsà	ⁿ dòò	sītā
Mix	tātá	kùmí	---	kāčì	kóó	ⁿ zìǎ	ⁿ dóó	stāá
Sil	tātá	kòmì	kìbì	kāčì	kòò	ⁿ dùsà	ⁿ dòò	hìtá
Jic	---	kúmí	---	kátí	kóó	---	ⁿ dóó	šítá
Jam	tātá	kùmì	kǎbǎ	---	kòò	---	---	šitá

TONEMIC COUPLETS *LOW-LOW? (continued)

PM	69) *sini?	70) *xiyò?	71) *nāmǎ?	72) *nùù?	73) *nūni?	74) *yùù?	75) *yòò?
	"head"	"comal"	"soap"	"face"	"corn"	"stone"	"moon"
Diu	---	---	---	---	---	žú'ú	---
Pe	(ǎǎkǎ)	šíó	nāmá	núú	núní	žúú	žóó
Coa	---	šíǒ	---	nǔyǔ	---	šúú	šóó
Mol	šini(M)	---	nāmà(M)	nùù	nūni	---	žòò(M)
Oco	šini	---	---	nùù	nūni	žùù	---
Ata	šini	xīžò	nāmà	nūù	nūni	žūù	žōò
SM	šini(M)	xīò	nāmà	nūù(M)	nūni	žūù	žōò
Cac	ǎini(M)	šòò(M)	nāmà(M)	---	---	žùù	---
Xay	---	---	---	nùù	---	yùù(M)	---
Ay	šini?	---	nāmà?	---	nūni?	yūù?	---
Ala	---	šiyò	---	---	---	yùù	yòò
Met	šini	---	nāmà(ā)(M)	---	nūni(ī)(M)	yūù	---
Cah	sini	šiyò	---	nǒǒ	nōni	yūù	yòò
Mix	---	---	nāmǎ	núú	---	yúú	yóó
Sil	hini	šòò	nāmǎ	nùù	nūni	---	žòò
Jic	šini	---	---	nǔyǔ	núní	yúú	yóó
Jam	šini	siyò	nāmà	nùù	---	yùù	yòò

TONEMIC COUPLETS *LOW-LOW

	PM 76) *k̄k̄'ḡ	77) *kùkà	78) *kù'wì	79) *kà'ḡdè	80) *kà'ḡ	81) *k'wìyà	82) *sìkù	83) *sàxì
	"to go"	"comb"	"sister"	"to cut"	"to speak"	"year"	"niece"	"nephew"
Diu	---	---	kù'ḡ	---	---	---	áí'kù	áà'ší
Pe	k̄k̄'ḡ	kùkà	kù'ḡ	kè'ḡdè	k̄k̄'ḡ	k'wìá	áí'kù	áá'ší
Coa	k̄k̄'ḡ	---	---	ká'ḡdè!	---	k'wìá	---	---
Mol	k̄k̄'ḡ ¹⁹	---	kù'ḡ	---	k̄k̄'ḡ	k'wìzà	---	---
Oco	k̄k̄'ḡ ¹⁹	---	kù'ḡ	---	k̄k̄'ḡ	---	šìkù	sàxì
Ata	k̄k̄'ḡ	kùkà	kù'ḡ	kā'ḡdè	k̄k̄'ḡ	---	šìkù	sàxì
SM	k̄k̄'ḡ	kùkà	kù'ḡ	kā'ḡjà	k̄k̄'ḡ	k'wìà	šìkù	sàxì
Cac	---	kùkà	kù'ḡ	tè'ḡdè	k̄k̄'ḡ	kùà	---	---
Xay	---	---	kù'ḡ	tà'ḡdè	---	---	áíkù	áá'ší
Ay	k̄k̄'ḡ	---	kù'wà	kā'ḡd'jà	k̄k̄'ḡ	---	sìkù	sà'ší
Ala	k̄k̄'ḡ	k'wìkà	---	---	---	---	---	---
Met	---	---	kù'ḡ	kā'ḡd'jà	k̄k̄'ḡ	---	šìkù	sà'ší
Cah	---	---	---	kā'ḡdā	k̄k̄'ḡ	k'wìyà	---	šà'ší
Mix	---	k'wìkà	---	---	---	k'wìà	---	---
Sil	k̄k̄'ḡ	---	kì'ḡ	tà'ḡdà "broken"	k̄k̄'ḡ	k'wìyà	hùkù	há'ší
Jic	---	---	---	kà'ḡdà	k̄k̄'ḡ ²²	---	---	---
Jam	---	---	---	---	---	k'wìyà	---	---

TONEMIC COUPLETS *LOW-LOW (continued)

	PM 84) *xè'è	85) *yùkù	86) *yù'wè	87) *wìsì	88) *ḡḡ	89) *ùwì	90) *ò'ḡ
	"foot"	"herb, bush"	"thread"	"sweet"	"nine"	"two"	"five"
Diu	šé'ḡ	---	žù'ḡ	---	ḡ'ḡ	ú'ḡ	---
Pe	sá'ḡ	žùkù	žù'ḡ	(sá-)ḡáí	ḡ'ḡ	ú'ḡ	ḡ'ḡ
Coa	---	---	šù'ḡ	ḡ'ḡ	---	ú'ḡ	ḡ'ḡ
Mol	---	žùkù	---	ḡ'ḡ	ḡ'ḡ	ù'ḡ	ḡ'ḡ
Oco	xè'è	žùkù	---	---	---	---	---
Ata	xè'è	žùkù	žù'ḡ	ḡ'ḡ	ḡ'ḡ	ù'ḡ	ḡ'ḡ
SM	xà'ḡ	žùkù	žù'ḡ	ḡ'ḡ	ḡ'ḡ	ù'ḡ	ḡ'ḡ
Cac	sà'ḡ	---	žù'ḡ	ḡ'ḡ	ḡ'ḡ	---	---
Xay	---	---	yù'ḡ	ḡ'ḡ	ḡ'ḡ	ù'ḡ	---
Ay	---	yùkù "leaf"	---	---	---	ùwì	---
Ala	šà'ḡ	---	yì'ḡ	---	---	---	---
Met	šà'ḡ	---	---	ḡ'ḡ	---	---	---
Cah	šà'ḡ	yùkù	---	wìsì	ḡ'ḡ	òwì	ḡ'ḡ
Mix	---	---	---	---	ḡ'ḡ	---	ḡ'ḡ
Sil	sà'ḡ	žùkù "weeds"	---	ḡ'ḡ	ḡ'ḡ	ì'ḡ	ḡ'ḡ
Jic	---	---	yù'ḡ	---	ḡ'ḡ	ú'ḡ	ḡ'ḡ
Jam	sà'ḡ	yùkù	---	---	---	---	---

FORMS WITH MODIFIED TONE(S)

PM	91) *tiy ₁ ʔ	92) *táy ₁ ʔ	93) *tá-yuʔ	94) *tá-yakaʔ	95) *tuʔ	96) *kasaʔ	97) *kaniʔ
	"finger-nail"	"rat"	"(turkey) hen"	"fish"	"black"	"sibling's husband"	"long"
Diu	---	---	---	čákà	---	kà'dá	---
Pe	---	táñá	---	čáká	túú	kàdà	kání
Coa	č ₁ í ₁	---	čúú	čá'ká!	---	kàdà!	kànì
Mol	---	---	---	čákā	tūū	---	kání
Oco	---	---	čúú	---	---	kàsá	kání
Ata	Ní ₁ í	Náñá	čúú	čáká	Núú	kàsá	kání
SM	tíñū	tānī	čúú/tī-nūú	čáká/tā-žáká	túú	kàsá	kání
Cac	čí ₁	---	čúú	tī-žákā	---	---	kánì
Xay	čí ₁	---	---	s-yākā	---	kādà	---
Ay	---	---	t ^v úúʔ	t ^v ákáʔ	túúʔ	kàsáʔ	kánìʔ
Ala	čí ₁	---	túú	tíáká	túú	---	kánì
Met	čí ₁	tí ₁	---	t ^v áká	---	kāsā	---
Cah	čí ₁	---	t ^v úú	t ^v áká	tnúú	---	---
Mix	čí ₁	---	čúú	---	---	---	---
Sil	čí ₁	tí ₁	---	tī-žáká	túú	kàhá	---
Jic	tíñī	---	---	---	túú	---	---
Jam	---	tāñá	---	---	---	---	kání

FORMS WITH MODIFIED TONE(S) (continued)

PM	98) *kaʔnuʔ	99) *k ^w ix ₁ ʔ	100) *k ^w iiʔ	101) *k ^w eti	102) *k ^w eʔe	103) *k ^w aḡ	104) *n ^d aʔwí
	"big (sg)"	"white"	"green"	"small (in pieces)"	"red"	"yellow"	"poor"
Diu	káʔnù	---	---	---	---	'k ^w áḡ	---
Pe	káʔnù	k ^w íx ₁ ʔ	k ^w íi	---	(tá-)k ^w eʔé	k ^w áḡ	n ^d áʔwí
Coa	káʔnù	k ^w íx ₁ ʔ!	k ^w íi	k ^w ečì	k ^w eʔé!	k ^w áḡ!	n ^d áʔwí!
Mol	---	---	---	k ^w ečì	---	---	n ^d áʔwí
Oco	káʔnū	k ^w íx ₁ ʔ	---	---	---	---	n ^d áʔwí
Ata	káʔnū	k ^w íx ₁ ʔ	---	---	---	k ^w áḡ	n ^d áʔwí
SM	káʔnū	k ^w íx ₁ ʔ	k ^w íi	k ^w áčí	k ^w áʔá	k ^w áḡ	n ^d áʔwí
Cac	---	kúší	k ^w íi	---	k ^w áʔá	k ^w áḡ	---
Xay	---	---	---	k ^w ātī	k ^w áʔá	k ^w áḡ	n ^d áʔwí
Ay	káʔnúʔ	---	k ^w íiʔ	k ^w áčí	k ^w áʔá	k ^w áḡ	n ^d áʔwí
Ala	"important"	---	---	---	k ^w áʔá	k ^w áḡ	---
Met	káʔnū	---	---	k ^w áčī	k ^w áʔá	k ^w áḡ	---
Cah	kāʔnō	---	k ^w íí	k ^w áčí	k ^w áʔá	k ^w áḡ	n ^d áʔwí
Mix	káʔnū	k ^w íx ₁ ʔ	k ^w íí	---	k ^w áʔá	k ^w áḡ	---
Sil	káʔnū	---	k ^w íi	---	k ^w áʔá	k ^w áḡ	---
Jic	---	---	k ^w íi	k ^w ātī	---	k ^w áḡ(-čí)	---
Jam	káʔnū	---	---	---	---	"it is yellow"	n ^d áʔwí

FORMS WITH MODIFIED TONE(S) (continued)

PM	105) *siko?	106) *si-yu?y?	107) *xee	108) *lu?u	109) *ye-yiwí?	110) *yaa
	"to sell"	"precious metal"	"new"	"little"	"people"	"tongue"
Diu	---	---	---	'lùčì	---	---
Pe	ǎìkò	ǎí?ú	sàà	lí?lì	ñá-žìù	žáá
Coa	---	ǎyú?ú	šéě	lù?nǎí!	---	---
Mol	šìkō	šǔ?ū	---	lūlī	ñà-žìbī	---
Oco	šìkó	šǔ?ú	xēé	lūlí	nǐbī	žáá
Ata	šìkó	šǔ?ú	xēé	lùlí	ñà-žūū	žáá
SM	šìkó	šǔ?ú	xáá	lúlí	ñà-žìbī	žáá
Cac	ǎìkò	---	sàà	līlūū	---	žáà
Xay	---	---	---	---	---	yáá
Ay	šìkò?	šǔ?ú?	---	lúlu	nè-yíwì?	yáà
Ala	---	---	šāá	---	nǐbī	lāà
Met	---	---	---	---	yūúbī	---
Cah	síkò	---	---	lō?ō	---	yáá
Mix	---	šǔ?ū	ǎǎ	lūū	---	yáá
Sil	hìkó	hyǔ?ú	sàá	lō?ō	žìbī	žáà
Jic	šìkò	šǔ?ú	čàà	lù?ù	ñíbī	---
Jam	---	---	sāá	lú?lū	ñì-yìbī	---

ALPHABETICAL INDEX OF COGNATE SETS

NOTE: Numbers in brackets refer to the corresponding cognate set in this study, those preceded by 'J' refer to the sets in Josserand (1983).

*íkú (29, J170)	"yesterday"	*kàtì? (64, J50)	"cotton"
*ínà (45)	"dog"	*ká?wí (23)	"to burn"
*ínì (44)	"inside"	*káxí? (2, J102 *xexi?)	"to eat"
*ísù (43, J12)	"deer"	*kíxí (18, J67)	"to come (move toward place of locutionary act and return away from it)"
*ítà (42)	"flower"	*kè?ǔ (76)	"to go (move away from place of locutionary act)"
*ítí? (15)	"road"	*kèsí (49, J94)	"clay pot"
*íǔ (30)	"one"	*kétí? (1, J35)	"animal"
*ìǔ (88)	"nine"	*kèwí? (62, J4)	"four"
*kàá (50)	"metal"	*kèwè? (63, J154)	"day"
*kà?ǎ (80)	"to speak"	*kòò? (65, J69)	"snake"
*kákà (33)	"lime"	*kóó (25)	"to drink"
*kákú (22, J173)	"to be born"	*kótó (24)	"to look"
*kani? (97)	"long"	*kòyó (51, J30)	"meat"
*kà?nǎ (79)	"to cut"	*kùkà (77, J172)	"comb"
*ka?nu? (98, J65)	"big"	*kúnú (19)	"to run"
*kasa? (96)	"sibling's husband"	*kúwí (20)	"to be"
*kátá (21)	"to sing"		

ALPHABETICAL INDEX OF COGNATE SETS (continued)

*kù?wì (78)	"woman's sister"	* ⁿ dìxè? (66, J125)	"sandal"
*k ^w áǎ (26)	"to buy"	* ⁿ dòò? (67, J93)	"cane"
*k ^w aǎ (103, J78)	"yellow"	* ⁿ dòó (53)	"adobe"
*k ^w á?á (52)	"cross-sex sibling"	* ⁿ dúté? (4, J22 * ⁿ dute)	"water"
*k ^w e?e (102, J31)	"red"	* ⁿ dútí? (3, J21)	"beans"
*k ^w eti (101)	"small (in pieces)"	*ò?ǎ (90, J28)	"five"
*k ^w ii? (100)	"green"	*sá?wǎ? (6)	"clothes"
*k ^w ixǐ (99)	"white"	*sàxǐ (83)	"nephew"
*k ^w iyà (81, J74)	"year"	*sà?yí (54, J110)	"child"
*lǎà (37, J147)	"bird"	*siko? (105)	"to sell"
*lǎ?wà (36, J148)	"frog"	*sikù (82)	"niece"
*lòó (56, J129)	"ear"	*sini? (69)	"head"
*lu?u (108, J153)	"little"	*sísì (35)	"aunt"
*náwǎ (38, J86)	"wall"	*sità? (68, J15)	"tortilla"
*nàwǎ? (71)	"soap, amole plant"	*sító (34)	"uncle"
*nòni? (73, J85)	"corn"	*si-yu?y? (106)	"precious metal"
*nòó (57, J27)	"tooth"	*tàtǎ? (61)	"medicine"
*nù? (72)	"face"	*tèyé (47, J52)	"man"
* ⁿ dá?á? (5)	"hand"	*téyù (32, J168)	"stool"
* ⁿ da?wi (104, J107)	"poor"	*tìxí (46)	"stomach"

ALPHABETICAL INDEX OF COGNATE SETS (continued)

*tiyǐ? (91, J107)	"fingernail"	*yaa (110)	"tongue"
*tíyó (16, J49)	"work"	*yá?á? (12)	"chile"
*tǐ-yaka? (94)	"fish"	*yá?ǎ? (13)	"woman"
*tǐyǐ? (92, J142)	"rat"	*yáwì (41, J135)	"hole"
*tǐ-yuy? (93)	"(turkey) hen"	*yéni (40, J25)	"man's brother"
*tóó (17, J62)	"handspan"	*yè-yǎwǐ? (109, J99)	"people"
*tòó (48, J9)	"word"	*yǎkǎ? (11)	"bone"
*tútù (31)	"paper"	*yòò? (75)	"moon"
*tuuy? (95)	"black"	*yóó? (14)	"rope"
*ùwì (89, J138)	"two"	*yùkù (85, J179)	"herb, bush"
*wà?á (6, J112)	"good"	*yúkú? (8, J71)	"mountain"
*wé?yí (28, J164)	"house"	*yùté (58, J23)	"river"
*wìsǐ (87, J133)	"sweet"	*yútú? (7, J11)	"tree"
*wítǐ (27, J134)	"now"	*yúyù (39, J100)	"town"
*wìxǐ (59, J124)	"cold"	*yùù? (74, J175)	"stone"
*xee (107)	"new"	*yú?ú? (10, J176)	"mouth"
*xè?è (84, J119)	"foot"	*yù?wè (86, J34)	"thread"
*xènú (55)	"sibling's wife"	*yúwí? (9, J3)	"straw mat"
*xìyò? (70, J19)	"comal"		

NOTES

- 1 What traditionally is called Mixtec are groups of mutual unintelligible dialects probably better to be treated as separate languages.
- 2 Longacre's two dialects San Miguel (M-SM) and Atlatlahuca (M-SE) tend to fuse Proto-Mixtec *low-low with *high-low, therefore *low-low could not be reconstructed except for supplementary data.
- 3 Note Metlatonoc tīšī, kū'ba, sē'e and s̄anù; Jicaltepec káā and Čánū; Ayutla sō'ò, sī'e and t'yāà; Cahuatache, Silacayoapan and Metlatonoc kàà, Metlatonoc kùñù or Silacayoapan tàà.
- 4 Note Alacatlazala t̄ayì, yābì vs. ñq̄, yūsū and īnā; Mixtepec yābì, s̄a'èà or t-īnā; Metlatonoc t'yāyù, šītò and nāmà. For Diuxi and Coatzospan no clear correspondence can be established.
- 5 Note Ayutla ⁿdà'á', sà'má', ìtú', yù'ú' and one reflex of *low-low': kùmí'; other dialects, e.g. Ocotepc ⁿdā'á', žū'ú' and Cahuatache yīwí.
- 6 Cf. Peñoles kúmí(M) < *k̄w̄ì', ák̄á(M) < *s̄k̄k̄', žk̄k̄(M) < *yá'k̄í'; but: ú'ú' < *ùwì, žž < *íí. But note Daly (1973: 104): "there are no high tone nouns like ú'ú', but all are like kúmí with a basic conditioner."
Diuxi [+A] as used in the revised analysis of Diuxi tone (Daly 1978) can equally be called [+modify]: kó'ó(M) < *kòò', k̄t̄t̄(M) < *k̄t̄t̄'; but: ú'ú' < *ùwì, žž < *íí.
- 7 Cf. Jicaltepec high-high (sandhi class I) kúmí < *k̄w̄ì', šíní < *s̄inì', low-low (sandhi class I) yù'ù' < *yú'ú'; but: high-high (sandhi class III) úná < *òná, low-low (sandhi class II) žž < *íí.
- 8 Cf. Coatzospan á'č̄ < *s̄it̄', k'w̄iá < *k'w̄iyà, è'ì'ì < *wé'yí, šù'ù' < *yú'ú'. Note the appearance of a medial glottal stop in the reflex of *s̄it̄' and other forms. Possibly final glottal stop became a medial glottal stop in this dialect.

- 9 Cf. animal names like *ínà, *láà, *lá'wà, *ísò and *ísù; kinship terms like *sà'yí, *k'wà'á, *xènú and *sítò, *sísì, *yéni; numerals like *ùwì, *ò'ò, *íí.
- 10 There is still another complication. Dürr (1984) gives evidence for compounds having identical semantics, an identical modifier but showing alternation of the nucleus.
- 11 The couplets San Miguel high-low, Molinos high-mid and high-low and Cacaloztepec high-mid never have perturbing power - it seems that all these forms did not result from Proto-Mixtec forms with a final glottal stop.
- 12 There are similar recent sandhi rules perturbing high-high following low tone to low-high in San Miguel, Ocotepc, Xayacatlán and Mixtepec.
- 13 Longacre had only at hand data from two closely related dialects and Rensch leans heavily on Longacre as to Proto-Mixtecan and as to his reconstruction of three phonemic tones in Proto-Otomanguean. A critical attitude towards these reconstructions seems to be characteristic for anyone who works on Proto-Mixtec, cf. Josserand (1983: 101): "A new reconstruction of Proto-Mixtec was presented by Bradley and Josserand (1978, 1982), which will have an effect on the reconstruction of Proto-Mixtecan."
- 14 It may be worth while mentioning that a similar evolution can be documented in Chinese. From the fourteenth century on compounds of two morphemes with similar meaning began to intrude into Chinese novels, the literary form next to spoken language. As a result, present-day Chinese has many bisyllabic words corresponding to Ancient Chinese monosyllabic ones, e.g. Ancient Chinese yǎn "eye" became yǎnjing, ěr "ear" became ěrduo, bí "nose" became bízi (Kuan 1977: 6).
- 15 Longacre (1957) reconstructed four phonemic tone levels for Proto-Mixtecan. Tone 3 is a level tone between mid and low.

- 16 Tone is indicated as follows: ' = high, ¯ = mid, ` = low, ^ = fh1, ˇ = fml, ˇ = rlh, ˇ = rmh. Note that Diuxi tonemic couplets are given according to the reanalysis of Daly (1978). The apostrophe indicates nonpredictable word-final stress, which is a feature of tone. In Coatzospan, the exclamation mark indicates a process phoneme causing downstepping terrace tone. As an exception, in Peñoles ^ indicates modified low tone and ˇ modified high tone. The tone notation for Cahuatache used by Schultze (1938) is not totally unequivocal.
- 17 The following list contains 110 cognate sets selected from a larger list of 320 reconstructed forms. Of these, 255 sets can be found in my M.A. thesis (Dürr 1982), but there I used a different system of reconstruction, for at that time I had not at hand the reconstructions done by Bradley and Josserand (1982) and Josserand (1983). As a result of the reduction of presented data, several details may seem not as evident as they are in consideration of all cognate sets.
- 18 Josserand (1983: cognate set 22) did not reconstruct a final glottal stop because of lack of data from Ayutla and Zacatepec (both dialects show a non-cognate word).
- 19 This form is in the continuative aspect for which - in area A - high tone is a characteristic feature.
- 20 The form Diuxi tú'tú (Pike and Oram 1976: 322) corresponds either to the tonemic couplet low-'high / 'low-high or to low-'low / 'low-low of Daly's (1978) reanalysis of Diuxi tone. Note, that I had not enough data at hand to standardize tone according to Daly (1978). Therefore most Diuxi forms have been cited as in the source and tone notation is inconsistent.
- 21 In Coatzospan a number of basic tonemic couplets cannot occur in isolation. These couplets have special isolation variants: low-high! for basic couplets high-high! (nouns) and !fh1-high, high-rlh for basic couplets high-low (verbs), high-high! (adjectives) and high-high.
- 22 In Jicaltepec the continuative couplet form low-mid has as incompletive basic form either a couplet high-high or low-low.

REFERENCES

- Alexander, Ruth María
1980 *Gramática Mixteca – Mixteco de Atlatlahuca*. México.
- Bradley, C. Henry
1970 *A Linguistic Sketch of Jicaltepec Mixtec*. Norman.
- Bradley, C. Henry, and J. Kathryn Josserand
1982 "El protomixteco y sus descendientes." In *Anales de Antropología*, 19 (tomo II): 279 - 343, México.
- Daly, John P.
1973 *A Generative Syntax of Peñoles Mixtec*, Norman.
1973a "Tone Sandhi and Rule Ordering in Peñoles Mixtec." In *Workpapers of the Summer Institute of Linguistics, University of North Dakota*, 17: 80 - 105, Grand Forks.
1977 "A Problem in Tone Analysis." In: William R. Merrifield (Ed.): *Studies in Otomanguean Phonology*, pp. 3 - 20, Arlington.
1978 "Notes on Diuxi Mixtec Tone." In *Workpapers of the Summer Institute of Linguistics, University of North Dakota*, 22: 98 - 113, Grand Forks.
- Daly, John P., and Margarita Holland de Daly
1977 *Mixteco de Santa María Peñoles*. México. (Archivo de lenguas indígenas de México 3).
- Dürr, Michael
1982 *Töne und Tonveränderung im Mixtekischen: Vergleich der Tonsysteme mixtekischer Dialekte*. M. A. thesis, Free University of Berlin.
1984 „Die Etymologisierung von Komposita im Mixtekischen. Bemerkungen zur Problematik anhand einiger Beispiele.“ In *Indiana 9* (Gedenkschrift Gerdt Kutscher Teil 1): 189 - 206, Berlin.
- Dwyer, David
1981 "Loma, a Language with Inverted Tones." In *Anthropological Linguistics*, 23: 436 - 442, Bloomington.
- Dyk, Anne, y Betty Stoudt
1965 *Vocabulario mixteco de San Miguel el Grande*. México.
- Hombert, Jean-Marie
1978 "Consonant Types, Vowel Quality, and Tone." In: Victoria Fromkin (Ed.): *Tone – A Linguistic Survey*, pp. 77 - 111, New York.
- Hunter, Georgia, and Eunice V. Pike
1969 "The Phonology and Tone Sandhi of Molinos Mixtec." In *Linguistics*, 47: 24 - 40, The Hague.

- Hyman, Larry M.
1978 "Historical Tonology." In: Victoria Fromkin (Ed.): *Tone – A Linguistic Survey*, pp. 257 - 270, New York.
- Josserand, J. Kathryn
1983 *Mixtec Dialect History*. Ph. D. dissertation, Tulane University, New Orleans.
- Kuan, Yu-chien
1977 *Die Grundregeln des modernen Hochchinesisch*. Hamburg.
- Longacre, Robert E.
1957 *Proto-Mixtecan*. *International Journal of American Linguistics*, 23.4, part 3, Chicago (Publication 5 of the Indiana University Research Center in Anthropology, Folklore, and Linguistics).
- Mak, Cornelia
1953 "A Comparison of Two Mixtec Tonemic Systems." In *International Journal of American Linguistics*, 19: 85 - 100, Chicago.
1958 "The Tonal System of a Third Mixtec Dialect." In *International Journal of American Linguistics*, 24: 61 - 70, Chicago.
- Mak, Cornelia, and Robert E. Longacre
1960 "Proto-Mixtec Phonology." In *International Journal of American Linguistics*, 26: 23 - 40, Chicago.
- Merrifield, William R. (Ed.)
1981 *Proto-Otomanguean Kinship*. Dallas.
- North, Joanne, and Jāna Shields
1977 "Silacayoapan Mixtec Phonology." In: William R. Merrifield (Ed.): *Studies in Otomanguean Phonology*, pp. 21 - 33, Arlington.
1978 *Gramática Popular del Mixteco de Silacayoapan*. México.
- Overholt, Edward
1961 "The Tonemic System of Guerrero Mixtec." In: Benjamin F. Elson (Ed.): *A William Cameron Townsend en el Vigésimoquinto Aniversario del Instituto Lingüístico de Verano*, pp. 597 - 626, México.
- Pankratz, Leo, and Eunice V. Pike
1967 "Phonology and Morphotonemics of Ayutla Mixtec." In *International Journal of American Linguistics*, 33: 287 - 299, Chicago.
- Pensinger, Brenda J.
1974 *Diccionario mixteco-español, español-mixteco*. (Mixteco del este de Jamiltepec, pueblo de Chayuco). México.
- Pike, Eunice V., and John H. Cowan
1967 "Huajuapán Mixtec Phonology and Morphophonemics." In *Anthropological Linguistics*, 9.5: 1 - 15, Bloomington.
- Pike, Eunice V., and Thomas Ibach
1978 "The Phonology of the Mixtepec Dialect of Mixtec." In: Mohammad Ali Yazayerly, Edgar C. Polomé and Werner Winter (Eds.): *Linguistic and Literary Studies in Honor of Archibald A. Hill*, vol. 2 (*Descriptive Linguistics*), pp. 271 - 285, The Hague.
- Pike, Eunice V., and Joy Oram
1976 "Stress and Tone in the Phonology of Diuxi Mixtec." In *Phonetica*, 33: 321 - 333, Basel.
- Pike, Eunice V., and Priscilla Small
1974 "Downstepping Terrace Tone in Coatzacoapan Mixtec." In: Ruth M. Brend (Ed.): *Advances in Tagmemics*, pp. 105 - 134, Amsterdam.
- Pike, Eunice V., and Kent Wistrand
1974 "Step-Up Terrace Tone in Acatlán Mixtec." In: Ruth M. Brend (Ed.): *Advances in Tagmemics*, pp. 81 - 104, Amsterdam.
- Pike, Kenneth L.
1947 "Grammatical Prerequisites to Phonemic Analysis." In *Word*, 3: 155 - 172, Worcester, Mass.
- Pike, Kenneth L.
1948 *Tone Languages*. Ann Arbor.
- Rensch, Calvin R.
1976 *Comparative Otomanguean Phonology*. Bloomington. (Indiana University, Language Science Monographs 14).
- Schuh, Russell G.
1978 "Tone Rules." In: Victoria Fromkin (Ed.): *Tone – A Linguistic Survey*, pp. 221 - 256, New York.
- Schultze Jena, Leonhard
1938 *Indiana III – Bei den Azteken, Mixteken und Tlapaneken der Sierra Madre del Sur von Mexiko*. Jena.
- Zylstra, Carol F.
1980 "Phonology and Morphophonemics of the Mixtec of Alacatlazala, Guerrero." In *S. I. L.-Mexico Workpapers*, 4: 15 - 42, México.