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TOTOZOQUEAN[1]

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This paper uses the comparative method of historical linguistics to investigate the hypothesis that languages of two well-established families of Mesoamerica, Totonacan and Mixe-Zoquean, are related in a larger genetic grouping dubbed Totozoquean. Proposed cognate sets comparing words reconstructed for Proto-Totonacan (PTn) and Proto-Mixe-Zoquean (PMZ) show regular sound correspondences attesting to the descent of these two languages from Proto-Totozoquean (PTz). Identification of sound correspondences facilitates reconstruction of PTz's phonological inventory and vocabulary. The PMZ words used in the comparison are from Wichmann (1995). The PTn words are reconstructed by the authors, who provide the Totonacan cognate sets on which these reconstructions are based, as well as discussion of the classification and phonological history of Totonacan languages. Evidence is cited indicating that Totozoquean is comparable to Indo-European in chronological depth.

[KEYWORDS: historical linguistics, Mesoamerica languages, Mixe-Zoquean, Totonacan]

1. Introduction. This paper assembles 188 cognate sets providing evidence for the phylogenetic relationship of two well-established language families of Mesoamerica, Totonacan and Mixe-Zoquean. Modern languages belonging to the Totonacan family are spoken in east-central Mexico in the states of Hidalgo, Puebla, and (northern) Veracruz. Modern Mixe-Zoquean languages are spoken in southern Mexico in the states of Chiapas, Oaxaca, Tabasco, and (southern) Veracruz (see figure 1).[2] Data assembled and analyzed support the hypothesis that these two families constitute a Mesoamerican super-family to which we have given the name Totozoquean.

While the genetic linkage of the Totonacan (Tn) and Mixe-Zoquean (MZ) families has been proposed in earlier studies (see **7** below), this paper is the

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[2] A map more precisely locating the Totonacan languages included in this study can be found in figure 8 below (see also Kondrak, Beck, and Dilts 2007); Wichmann (1995:xx–xxiii) can be consulted for more detailed maps locating MZ languages.

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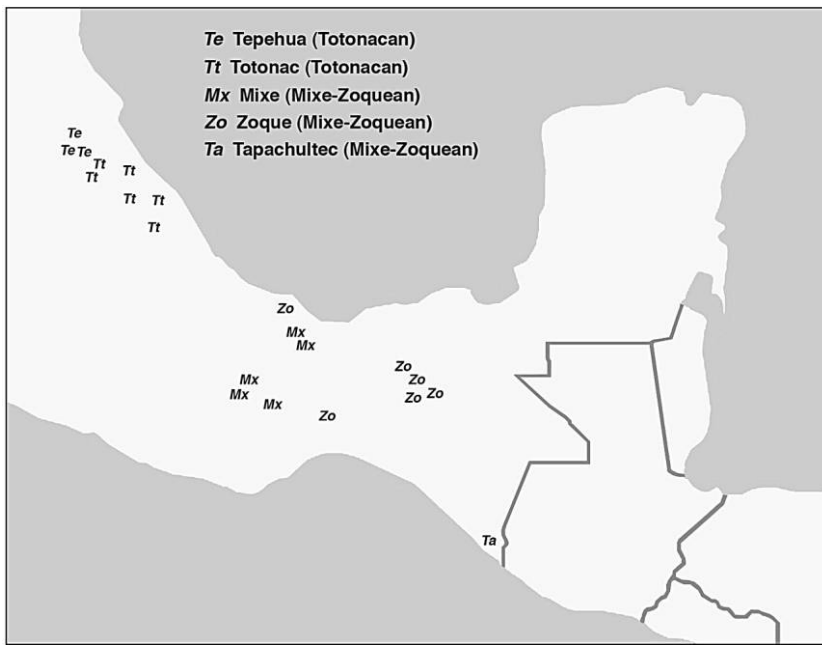

FIG. 1.—Approximate location of Totonacan and Mixe-Zoquean languages.

first systematic attempt to use the comparative method of historical linguistics to find regular sound correspondences for these families. Based on correspondences, we present reconstructions of the phonological inventory of Proto-Totozoquean and of a substantial set of its vocabulary.

2. The comparative corpus. Rather than using words from individual recorded languages, this study directly compares words reconstructed for both Proto-Totonacan (PTn) and Proto-Mixe-Zoquean (PMZ). For PMZ words, we rely on Wichmann (1995), who provides reconstructed words and their meanings—along with supporting cognate sets—not only for PMZ but also for ancestral languages descended from PMZ, including Proto-Mixean (PM), Proto-Oaxaca Mixean (POM), Proto-Zoquean (PZ), and Proto-Gulf Zoquean (PGZ) (see Appendix A for a complete listing of abbreviations). In Wichmann's study, the proto-language level of reconstruction is dependent on distribution of cognates across MZ languages. When such distributions do not support PMZ reconstructions, but rather support reconstructions for PM or POM or PZ or PGZ, we provide our own PMZ reconstructions based on recognition that if a cognate is found in PTn, a cognate form necessarily pertained to PMZ.

To date, no work on the reconstruction of PTn comparable in breadth and scope to Wichmann's for PMZ has been published. Consequently, little reconstructed PTn material is available for securely documenting a Tn/MZ genetic relationship. Earlier Tn comparative studies are tentative and impressionistic at best, or are based on cursory surveys involving small numbers of language communities and/or highly restricted word lists (e.g., Arana Osnaya 1953 and García Rojas 1978). This paper takes as its point of departure recent work by Kondrak, Beck, and Dilts (2007) which yields a considerable number of cognate sets for Tn languages beyond those previously available. These, combined with additional Tn sets assembled specifically for this study (see **5.3**), constitute the basis for reconstructing both the phonological inventory of PTn (**3.1**) and PTn words used in cognate sets for Proto-Totozoquean (**6**).

Our reconstructions for PTn should be regarded as both preliminary and provisional, given the limited nature of the comparative database for Totonacan languages now available, and given that we are concerned primarily with recovering lexicon of PTn relating to PTn/PMZ comparison rather than with providing the definitive statement on Totonacan phonological prehistory. Nevertheless, we hope the present analysis makes a modest contribution toward producing such a statement.

3. Phonological inventories. In this section, we present reconstructed phonological inventories for PTn, PMZ, and Proto-Totozoquean (PTz). The inventory for PTn is developed on the basis of the analysis in **5**, while the inventory for PMZ is that presented in Wichmann (1995). The inventory for PTz is based on analysis of cognate sets presented in **6**.

3.1. Proto-Totonacan phonological inventory. The reconstructed phonological inventory for PTn is presented in figures 2 and 3.[3] The PTn consonant inventory (fig. 2) differs very little from inventories found in most of the extant Tn languages, and differs in only two respects from the inventory reconstructed by Arana Osnaya (1953), these being the postulation of two back fricatives and the tentative inclusion of a glottal stop phoneme (both discussed in **5**). The principal differences involving consonants among PTn daughter languages have to do, for the most part, with the treatment of the uvular stop (q), the back fricatives (x and h), and the lateral obstruents (ɬ and ɮ). These topics are discussed in **5**.

[3] In this study, standard Americanist orthography (Pullum and Ladusaw 1996:298–99, 301–2) is used with the following additions and changes: ȼ = voiceless alveolar affricate; : after a vowel indicates length, ˈ after a vowel indicates laryngealization (creaky voice), ’ after a consonant indicates glottalization (ejectivization), ˊ above a vowel indicates stress. In some cases, orthographic representations used in original sources have been altered in the interest of consistency.

	Bilabial	Alveolar	Palato-alveolar	Palatal	Velar	Uvular	Glottal	Labio-velar
Plosive	p	t			k	q	(ʔ)	
Nasal	m	n						
Fricative		s	š		x		h	
Affricate		ȼ	č					
Approximant				y				w
Lateral Fricative		ɬ						
Lateral Affricate		ƛ						
Lateral Approximant		l						

FIG. 2.—Consonant inventory of Proto-Totonacan (PTn).

Plain

i(:)		u(:)
	a(:)	

Laryngealized

i(:)ˈ		u(:)ˈ
	a(:)ˈ	

FIG. 3.—Vowel inventory of Proto-Totonacan (PTn).

The reconstructed vowel inventory of PTn (fig. 3) is that which predominates among descendant languages—a three-vowel system with each vowel quality showing phonemic distinctions for length and laryngealization (creaky voice). However, as discussed in **5**, the vowel inventories of modern Totonacan languages are more varied than the consonant inventories, with some modern languages having five-vowel systems and others having lost distinctive vowel length and/or laryngealization.[4]

The syllable-nucleus canons for PTn are: V, V:, Vˈ, and V:ˈ.

[4] A competing interpretation, discussed in **5.2.1**, is that vowel creakiness did not pertain to PTn but rather developed from ejective stops and affricates immediately preceding syllable nuclei.

	Bilabial	Alveolar	Palatal	Velar	Glottal	Labio-velar
Plosive	p	t		k	ʔ	
Nasal	m	n				
Fricative		s			h	
Affricate		ʦ				
Approximant			y			w

FIG. 4.—Consonant inventory of Proto-Mixe-Zoquean (PMZ).

i(:)		u(:)
e(:)	ə(:)	o(:)
	a(:)	

FIG. 5.—Vowel inventory of Proto-Mixe-Zoquean (PMZ).

3.2. Proto-Mixe-Zoquean phonological inventory. The reconstructed phonological inventory for PMZ from Wichmann (1995) is presented in figures 4 and 5.

The syllable-nucleus canons for PMZ are: V, Vh,[5] Vʔ, VʔV, V:, and V:ʔ.

The inventories of consonants and vowels of PMZ are generally maintained in the daughter languages. Both PM and PZ retain a system of six vowel qualities, but the distinction of vowel length is lost in Zoquean. Some Oaxaca Mixean variants develop a richer system of vowels due to umlaut. As for the consonants, no major changes are observed. Zoquean and Mixean differ in their reflexes of *s, the former exhibiting a plain sibilant and the latter a palatal or retroflex sibilant (descriptions of individual languages are not always clear on this matter). A syllable-final *w shifts to *ŋ* in Zoquean.

Overall, the consonant inventories of PMZ and PTn are very similar. The inventory of PMZ is smaller than that of PTn by seven segments. All 11 consonants of PMZ are also found in PTn. The major difference between the two is that PTn shows three laterals (*ɬ, *ɮ, *l), while PMZ shows no laterals

[5] PMZ *Vh is phonetically a sequence of a vowel and a glottal fricative. For phonotactic purposes, including the specification of verb root patterns, where CNC is a strongly preferred canon (N being a syllable nucleus), Vh is most appropriately interpreted as a single syllable nucleus.

	Bilabial	Alveolar	Palato-alveolar	Palatal	Velar	Uvular	Glottal	Labio-velar
Plosive	p	t, t^y			k, k^y	q	ʔ	
Nasal	m	n, n^y						
Fricative		s	š		x		h	
Affricate		ȼ	č					
Approximant				y				w
Lateral Affricate		ƛ						
Lateral Fricative		ɬ						
Lateral Approximant		l						

FIG. 6.—Consonant inventory of Proto-Totozoquean (PTz).

i(:)	ɨ(:)	u(:)
e(:)	ə(:)	o(:)
	a(:)	ɔ(:)

FIG. 7.—Vowel inventory of Proto-Totozoquean (PTz).

whatsoever.[6] Other differences are that PTn shows a palato-alveolar fricative (*š), a palato-alveolar affricate (*č), a uvular stop (*q), and a velar fricative (*x), while PMZ does not. The vocalic inventory of PMZ with respect to vowel quality is twice the size of that found for PTn. PMZ is similar to PTn in distinguishing vowel length but different in lacking vowel laryngealization.

3.3. Proto-Totozoquean phonological inventory. The reconstructed phonological inventory for PTz is presented in figures 6 and 7.

The consonant inventory reconstructed for PTz (fig. 6) is somewhat richer than either the inventory of PTn or that of PMZ, the two daughter languages having simplified this stock in different ways.

For PTz we have posited two velar plosives, these being a back velar, k, and a palato-velar, k^y. As outlined in **4.2**, PTz *k^y → PTn *k and PMZ *k, and PTz *k → PTn *q and PMZ *k. Our reconstructed phonology in figure 6,

[6] We reconstruct the three laterals for PTz (**3.3**). Under this interpretation, the laterals have been retained by PTn and have shifted to *y in PMZ (**4.2**).

then, proposes a four-way distinction for PTz involving unvoiced back stops (a palato-velar, a back velar, a uvular, and a glottal). While such a four-way contrast may be rare, it is attested in modern languages—for example, in languages of the North Wakashan family (Lincoln and Rath 1980). However, there is another possibility. As discussed in **5**, *k* and *q* are commonly found to alternate in modern Totonacan languages. Plausibly, instead of a two-way velar distinction in PTz (k and k^y), there was a single velar stop realized variably in PTn as *k and *q (but simply as *k in PMZ). If so, this indicates that the widespread alternation entailing *k* and *q* of living Tn languages traces back to their common ancestor (PTn). In addition to the extra velar stop, other segments reconstructed for PTz but not found in the inventories of either PTn or PMZ are palatalized versions of PTz *t and *n, respectively, *t^y and *n^y.

Like the consonant inventory, the PTz vowel stock is richer than either that of PTn or PMZ with respect to number of vowels of different quality (fig. 7).

The syllable-nucleus canons for PTz are: V, Vh, V:.

We have posited both a low back vowel (*ɔ) and a high central vowel (*ɨ) for PTz, although these persist in neither set of descendant languages. The syllable nuclei of PTz are largely conserved in the daughter languages (see table 3 below). Of the two descendant groups, PMZ has preserved more of the vowel qualities of PTz.

4. Correspondences. In this section, selected correspondences pertaining to MZ are reviewed, and those proposed for Tz are presented. Sound correspondences proposed for Tn languages and the proto-segments from which these have developed are presented and discussed in **5**.

4.1. Mixe-Zoquean correspondences. The MZ family is segregated into Mixean (M) and Zoquean (Z) languages. The selected sound correspondences reviewed here hold between the respective ancestral languages of these two groups, PM and PZ. Awareness of these correspondences is helpful for evaluating patterns involving syllable nuclei in many of the cognate sets in **6**. These correspondences are from Wichmann (1995) and are observed in the following change rules:

PMZ *V:	→ PM *V:
	→ PZ *V
PMZ *CVC	→ PM *CVhC (in stressed, final syllables)
	→ PZ *CVC

It is also helpful for understanding syllable nuclei to know that no PMZ disyllabic forms reconstruct with a second-syllable long vowel (Wichmann 1995).

TABLE 1
CONSONANT CORRESPONDENCES FOR PTN/PMZ AND PTZ SEGMENTS FROM WHICH THESE DEVELOPED

PTz	PTn	PMZ	Number of Cognate Sets
č	č	ȼ	14
h	#h- Ø (elsewhere)	Ø / PTz *CV__C h (elsewhere)	31
k	q	k	38
k^y	k	k	33
l	l	y	11
ɬ	ɬ	y	6
ƛ	ƛ	y	4
m	m	m	19
n	n	n	21
n^y	l	n	2
p	p	p	37
q	q	ʔ	10
s	s	s	19
š	š	s	36
t	t	t	37
t^y	č	t	8
ȼ	ȼ	ȼ	14
w	w	w	13
x	x	h	6
y	t	y	9
ʔ	Ø	ʔ	67

TABLE 2
VOWEL QUALITY CORRESPONDENCES FOR PTN/PMZ AND PTZ SEGMENTS FROM WHICH THESE DEVELOPED

PTz	PTn	PMZ	Number of Cognate Sets
i / I	i	i	38
e / E	i	e	14
ɨ / Ɨ	i	ə	14
ə / Ə	a	ə	18
a / A	a	a	51
u / U	u	u	38
o / O	u	o	21
ɔ / Ɔ	a	o	15

4.2. Totozoquean correspondences. Tables 1, 2, and 3 present regular sound correspondences holding between PTn and PMZ, the segments of PTz from which these have developed, and the number of cognate sets of the 188 in **6** in which these occur.

TABLE 3
SYLLABLE NUCLEUS CORRESPONDENCES FOR PTN/PMZ AND ORIGINAL PTZ NUCLEI

PTz	PTn	PMZ	Number of Cognate Sets
V	V	V	151
Vh	V	V:	21
V:	V:	V:	44

The consonant correspondences are found in table 1.[7] Notable among these correspondences is the relationship between PTz and PTn lateral segments and PMZ *y, the latter proto-language being non-typical among languages for its lack of lateral consonants.

Table 2 presents vowel quality correspondences. Reconstructed PTz segments for the correspondences of table 2 each have two graphic realizations, lowercase and uppercase, both of which indicate the same vowel quality (e.g., both a and A indicate the low central vowel). When the uppercase version is used in a PTz reconstruction (see **6**), this indicates that the PTz word's reflex in PTn shows a laryngealized vowel (see discussion in **5.2.1**). By using this convention, we are acknowledging that at present not enough information is available to take a stand on the issue of what phonological feature or complex in PTz gave rise to laryngealized vowels in PTn, while nonetheless recognizing that such a feature or complex pertained to PTz.

Table 3 presents syllable nucleus correspondences. The only major systematic change in table 3 concerns the loss of nuclei of the Vh pattern in both PTn and PMZ. The latter becomes a simple short vowel in PTn and gives rise to a long vowel in PMZ.

There are also regularities for PTn and PMZ involving context-conditioned change. Some of these entail developments from PTz consonant clusters. These are presented in table 4.[8]

The following are other context-conditioned changes:

PTz *V:# → PMZ *V [Tz6, 32, 33, 66, 69, 82, 115, 123, 134, 139, 166]
PTz *V:h# → PMZ *Vh [Tz20, 37, 180]

[7] Those PTz consonants that are supported by fewer than ten cognate sets are as follows, identified by number from the cognate sets given in **6**: *nʸ (Tz 45, 46), *ɬ (Tz31, 47, 48, 49, 137, 187), *x̌ (Tz50, 51, 62, 63), *q (Tz7, 14, 72, 89, 90, 97, 102, 131, 142, 188), *tʸ (Tz86, 153, 154, 155, 156, 157, 158, 159), *x (Tz51, 179, 180, 181, 182, 183), *y (Tz108, 120, 136, 182, 184, 185, 186, 187, 188).

[8] Cognate sets pertaining to the developments involving consonant clusters (table 4) and flagged by PTz reconstructions are: *mw (Tz65, 66, 67, 160), *kw (Tz30, 31, 32, 105, 121, 122), *nk (Tz50, 143), *nkw (Tz70, 71, 80, 105, 147, 148), *nK (Tz38, 64, 135, 143), *nKw (Tz85, 100), *nq (Tz72).

TABLE 4
PTn/PMZ Correspondences Developed from PTz Consonant Clusters

PTz	PTn	PMZ
mw	w	m
k^yw	k	w
nk^y	nk	k
nk^yw	#n-	w
	-nk	
nk	nq	k
nkw	#n-	w
	-nq	
nq	nq	ʔ

PTz *V:?# → PMZ *Vʔ [Tz22, 47, 53, 167]
PTz *č → PTn *k /#AN_# (where A = affricate [č, ȼ] and N = syllable nucleus) [Tz3, 163, 164]
PTz *#C_1C_2 → PMZ *#C_2 (where C_1 = fricative) [Tz47–49, 105–11, 114, 119–27, 129–32, 134–36]

5. Totonacan languages, phonological history, and cognate sets. When exclusively using reconstructed vocabulary in comparative analysis, the reconstructed words employed should ideally be from sources independent of the current analysis. This optimal situation is only partly realized here. Our PMZ reconstructions are from Wichmann (1995), a work published a decade and a half ago and without bias toward the Totozoquean proposal. However, our PTn reconstructions are necessarily self-supplied, given present deficiencies in the comparative study of Totonacan languages. It is incumbent upon us, the current analysts, to present the most thorough and transparent documentation possible relating to our proposed PTn reconstructions. Nevertheless, readers should bear in mind the preliminary and provisional nature of this analysis, which, while clearly adequate for the comparative analysis of MZ and Tn, is only a modest step toward a definitive description of Totonacan phonological prehistory.

5.1. The Totonacan family tree. With respect to internal reconstruction of the Totonacan family tree, relatively little systematic work has been published (for a detailed overview, see Levy 2005).

In following discussions, the term "Totonacan" (Tn) will be used to designate all languages of the family, including the three languages of the Tepehua branch—Huehuetla, Pisaflores, and Tlachichilco—which probably form a group separate from the others. The Totonacan languages minus Tepehua (Tp) are collectively referred to as "Totonac" (Tot) languages.

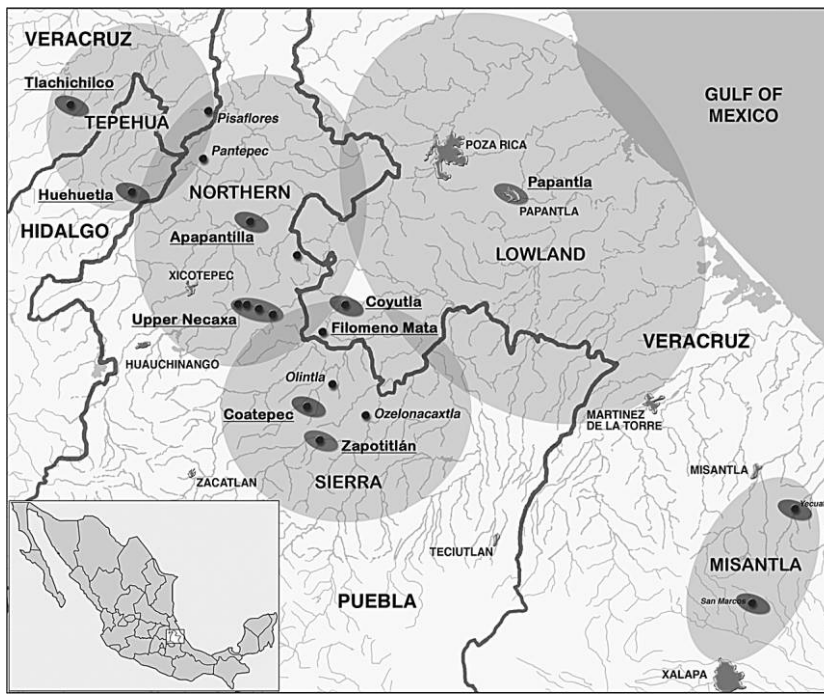

FIG. 8.—Location of Totonacan languages and divisions.

Tot languages have traditionally been grouped into three or four divisions. Here, we recognize Misantla, Northern, Sierra, and Lowland, the last three of these divisions consisting of an undetermined number of mutually unintelligible variants. These groups and some of the languages that make them up, including all of those used extensively in this study, are located on the map in figure 8.

While Misantla, a geographic outlier, is clearly distinct from the other members of the Tot branch, disagreement arises with regard to the relations among what might be called the Central Totonac group—Northern, Sierra, and Lowland. García Rojas (1978) divides this set of languages into two branches, grouping Lowland against Northern and Sierra, which are classified as subdivisions of a single group. On the other hand, Aschmann (cited in Ichon 1969) divides the Central group between Northern and Lowland-Sierra. Certain sound changes (principally, the emergence of phonemic /e/ and /o/) and a handful of grammatical features and lexical isoglosses support this view, as does recent work carried out by the ASJP consortium (Müller et al. 2009), which uses lexicostatistical data to compute lexical distance

TABLE 5
CLASSIFICATION OF TOTONACAN LANGUAGES

- TOTONACAN
  - TEPEHUA
    - Pisaflores
    - Tlachichilco
    - Huehuetla
  - TOTONAC
    - Misantla
    - CENTRAL TOTONAC
      - NORTHERN
        - Upper Necaxa (formerly Patla-Chicontla)
        - [Tecpatlán]
        - [Zihuateutla]
        - [Ozumatlán]
        - Apapantilla (a.k.a. Xicotepec Totonac)
        - [Pantepec]
        - [Cohuahuitlán]?
      - LOWLAND-SIERRA
        - [Filomeno Mata]
        - SIERRA
          - Coatepec
          - Coyutla
          - Zapotitlán (a.k.a. Sierra or Highland Totonac)
          - [Ozelonacaxtla]
          - [Olintla]
          - [Huehuetla Totonac]
        - LOWLAND
          - Papantla

between genetically related languages. Indeed, the latter work fails to distinguish Lowland and Sierra as coherent groups at all, although we will maintain the distinction here.

Given the sketchy evidence available and the lack of systematic efforts at internal reconstruction to date, our conclusions regarding the structure of the Tn family tree—summarized in table 5—should be regarded as tentative.[9] The classification proposed in table 5 is similar to that put forward by Davletshin (2008), who used lexicostatistical data from a smaller number of languages.

The Tp branch is generally thought to consist of three languages (Huehuetla, Pisaflores, and Tlachichilco). The number of languages in the Tot branch is

[9] Languages given in brackets in table 5 are not among the principal languages used in this study; they have been included because data are available relating to their potential classification, and in some cases we have been able to include a few forms from them in our cognate lists. Languages indicated with question marks are especially tentative classifications. Only languages from which data for our cognate sets have been drawn are included on the map in figure 8.

simply unknown. Estimates vary considerably, from three at the low end (MacKay 1994), to between 14 and 20 at the high end (Beck's estimate). While some of the uncertainty comes from the familiar problem of drawing the line between language and dialect, the crux of the matter is simply an absence of documentary materials and comparative work on the family.

5.2. Totonacan comparative phonology. The topic of comparative Tn phonology is a huge one and requires a much broader base of data than that provided by the limited cognate sets used in this study (which include only those PTn forms potentially cognate with PMZ words). Any conclusions drawn in this section, therefore, must be regarded as tentative, given PTn reconstruction is still in early days. Some preliminary work on this topic from a broader perspective has been undertaken by Watters (1992).

5.2.1. Vowels. Proto-Totonacan is reconstructed here with a system of three vowel qualities (the pattern that prevails in most of the daughter languages), *a, *i, and *u, each having a long and a short variant. In addition, following Arana Osnaya (1953), we reconstruct a distinction between modal and laryngealized (creaky) vowels for PTn, laryngealized vowels being a notable feature of most languages of the Tot branch. Individual languages vary as to the exact phonetic expression of laryngealization, although both Aschmann (1946) and Levy (1987) note that a frequent manifestation of vocalic laryngealization in syllables with obstruent onsets, in addition to or instead of non-modal phonation, is the occurrence of a glottal stop either following or preceding the syllable nucleus (Z favoring the former pattern and P the latter for syllables with stop or affricate onsets). For syllables with sonorant onsets, laryngealization is realized as non-modal phonation. In some languages, laryngealization of the final vowel of the verb has become associated with (or the primary exponent of) second-person singular subjects, and in many such contexts the laryngeal feature will spread leftward to adjacent vowels (Watters 1987).

Tp languages are generally analyzed as having no laryngealized vowels but instead have ejective stops (p', t', k', q')[10] and affricates (ȼ' and č') where Tot has the corresponding plain consonant + laryngealized vowel sequence. Our analysis is that the Tp ejectives arose from the migration of the laryngeal constriction associated with a creaky vowel first to the left edge of the nucleus in the form of a glottal stop (as seen in P) and then onto the preceding stop or affricate. This diachronic shift (stop + ʔ → ejective stop) is a cross-linguistically well-attested process (Fallon 2002). Laryngealization was lost in other environments. Some suggestive evidence supporting this approach

[10] This last segment (q') is not found in Tlachichilco, where it has become simply ʔ, and it has disappeared in the speech of younger speakers of Huehuetla Tepehua, where all uvular stops have become ʔ (Smythe Kung 2007). The same is true in Pisaflores Tepehua as well.

TABLE 6
VOWEL CORRESPONDENCES FOR TOTONACAN LANGUAGES

PTn	T	H	M	U	A	Z	C	P
*a	*a*	*a*	*a*	*a, e*	*a, e*	*a*	*a*	*a*
*i	*i*	*i*	*i*	*i, e*	*i, e*	*i*	*i*	*i*
*u	*u*	*u*	*u*	*u, o*	*u, o*	*u*	*u*	*u*
*a:	*a:*	*a:*	*a:*	*a:*	*a:*	*a:*	*a:*	*a:*
*i:	*i:*	*i:*	*i:*	*i:, e:*	*i:, e:*	*i:*	*i:*	*i:*
*u:	*u:*	*u:*	*u:*	*u:, o:*	*u:, o:*	*u:*	*u:*	*u:*
*a'	*a*	*a*	*a'*	*a'*	*a'*	*a'*	*a*	*a'*
*a:'	*a:*	*a:*	*a:'*	*a:'*	*a:'*	*a:'*	*a:*	*a:'*
*i'	*i*	*i*	*i'*	*i'*	*i'*	*i'*	*i*	*i'*
*i:'			*i:'*	*i:'*	*i:'*	*i:'*	*i:*	*i:'*
*u'	*u*	*u*	*u'*	*u'*	*u'*	*u'*	*u*	*u'*
*u:'	*u:*	*u:*	*u:'*	*u:'*	*u:'*	*u:'*	*u:*	*u:'*

is that the creation of ejectives from stop + ʔ sequences is still found morphophonemically in T (Watters 1988:257), and that stops preceding laryngealized vowels are reported by García Ramos (1979) to be ejectives in El Tajín Totonac.

An alternative interpretation, alluded to by Levy (1987:65), is that the Tp pattern is the conservative one, and that laryngealized vowels in Tot are innovative. We have carefully evaluated this position against available evidence and conclude that reconstruction of creaky vowels for PTn is the better approach since, of the two interpretations, the assumption of the priority of creaky vowels entails the least moves with respect to the number of rules that need be posited to account for developments in both branches of the family. However, reconstruction of laryngealized vowels here should not be regarded as conclusive, only somewhat more likely at present given the limited evidence available.[11]

Table 6 shows correspondences for vowels in Tn languages for which we have the best and most complete phonological information. All of the reconstructed vowels in the table are represented by a substantial number of reflexes in the cognate sets assembled below.

Vowel qualities are reasonably well preserved from the proto-language across the family, although sporadic correspondences are found involving all

[11] Should the alternative interpretation eventually prove valid, this would have no impact on the major conclusions of this study. While the precise nature of the sound shifts separating PTn and PMZ might change, the correspondences between cognate sets would not.

three possible alternations, e.g., *a* ~ *i* (T19, 68),[12] *a* ~ *u* (T159), and *i* ~ *u* (T22).[13] The most notable vocalic change in the family is the development of phonemic mid-vowels in Tp and in the Northern branch of Tot. For Tp, Watters (1988) and Smythe Kung (2006) analyze *e* and *o* as phonemic, although in both languages these phonemes are of limited distribution, being mostly the product of proximity to *q* or PTep *q', or created by other (diachronic or synchronic) phonological processes. In Northern Totonac, a number of forms in both U and A occur having no identifiable conditioning environment, although many of the mid-vowels seem to have developed from *i and *u in the proximity of *x (T6, 14, 25) and, to a lesser extent, *y (not attested in **5.3**). In general, however, PTn vowels are not lowered (or raised) consistently enough in Northern Totonac to account for the mid-vowels in terms of synchronic allomorphy.

One regular source of *e* and *o* in Northern Totonac is in forms where *i and *u become *e* and *o* when adjacent to *q* (*ʔ* in U—see **5.2.2**) or *nq (*nʔ*) (T1, 20, 24, 63, 114, 185), the proximity of the uvular triggering the lowering of the high vowels. This is a thoroughgoing change that applies not just in Northern Totonac but in all languages of the family. However, in the other Tot languages, *e* and *o* developed from high vowels are not considered phonemic (although in some cases the lowering of vowels is represented orthographically).

Vowel length seems to be even more consistently retained across the daughter languages, although vowel shortening is also found sporadically in individual cases (T6, 60, 87). P shows a tendency to shorten final long laryngealized vowels (T4, 15, 169, 171), although this is not an across-the-board phenomenon. Also, a few examples where Tp has a short vowel corresponding to a Tot long vowel (T86, 146, 164) occur. Cognate set T161 contains the only instance we have of lengthening of a PTn short vowel, the Northern languages having *oː'* where others have *o'*.

As noted above, one of the most important parameters for recognizing the major division within the Tn family involves laryngealized vowels, these being absent in the Tp branch but present in Tot. One Tot language, C (McQuown 1990), also lacks creaky vowels, and laryngealization is not transcribed in our sources for Ol and HT. For other languages, PTn *V' is generally preserved, although a great deal of sporadic loss of creak across the daughter languages (T29, 51, 58, 59, 93, 106) occurs, as well as some spontaneous creation of laryngealized vowels where we would reconstruct a modal vowel for PTn (T100, 139).

[12] Illustrative cognate sets from **5.3** are referred to by number (T1, T2, etc.).

[13] Variation of this type is also attested within certain modern languages (e.g., M *taq*, *tuq* 'knock [on door]'). Such variation in PTn may have been the source of similar differences between daughter languages.

TABLE 7
CONSONANT CORRESPONDENCES FOR TOTONACAN LANGUAGES

PTn	T	H	M	U	A	FM	Z	C	Co	P
*č	*č*	*č*	*č*	*č*	*č*	*č*	*č*	*č*	*č*	*č*
*čV'	*č'*	*č'*	*č*	*č*	*č*	*č*	*č*	*č*	*č*	*č*
*h	*h*	*h*	—	*x*	*x*	*x*	*h*	*h*	*h*	*x*
*k	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*
*kV'	*k'*	*k'*	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*
*l	*l*	*l*	*l*	*l*	*l*	*l*	*l*	*l*	*l*	*l*
*ɬ	*ɬ*	*ɬ*	*ɬ*	*ɬ*	*ɬ*	*ɬ*	*ɬ*	*ɬ*	*ɬ*	*ɬ*
*ƛ	*ɬ, t*	—	*(t)*	*ɬ*	*ƛ*	*ƛ*	*ƛ*	*ƛ*	*ƛ*	*ƛ*
*m	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*
*n	*n*	*n*	*n*	*n*	*n*	*n*	*n*	*n*	*n*	*n*
*nq	*q*	*q*	*nq*	*n?*	*nq*	*nq*	*nq*	*nq*	*nq*	*nq*
*p	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*
*pV'	*p'*	*p'*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*
*q	*q*	*q*	*q*	*?*	*q*	*q*	*q*	*q*	*q*	*q*
*qV'	*?*	*q*	*q*	*?*	*q*	*q*	*q*	*q*	*q*	*q*
*s	*s*	*s*	*s*	*s*	*s*	*s*	*s*	*s*	*s*	*s*
*š	*š*	*š*	*š*	*š*	*š*	*š*	*š*	—	*š*	*š*
*t	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*
*tV'	*t'*	*t'*	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*
*¢	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*
*¢V'	*¢'*	—	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*	*¢*
*w	*w*	*w*	*w*	*w*	*w*	*w*	*w*	*w*	*w*	*w*
*wa	*hu*	*hu*	*wa*	*wa*	*wa*	*wa*	*wa*	*wa*	*wa*	*wa*
*wi	*u*	*u*	*wi*	*wi*	*wi*	*wi*	*wi*	*wi*	*wi*	*wi*
*x	*h*	*h*	*h, ɬ*	*x*	*x*	*x*	*h*	*x*	*h*	*x*
*y	*y*	*y*	*y*	*y*	*y*	*y*	*y*	*y*	*y*	*y*

5.2.2. Consonants. Consonants on the whole are even more stable than vowels. As attested in table 7, virtual identity for the vast majority of consonant segments across the family is found. Here, we focus only on nonidentical correspondences.

The correspondence of Tp ejective consonants with their non-ejective counterparts in Tot is the only consonantal contrast of table 7 pertinent to distinguishing the two major branches of Tn. This contrast, as discussed in **5.2.1**, relates to developments involving laryngealized vowels, wherein, we speculate, PTn stops and affricates immediately preceding laryngealized vowels have become ejectivized in Tp with vowel creakiness lost, while in Tot ejectivization did not develop and PTn creakiness was retained (e.g., *p'* T180, *t'* T115, *k'* T42, *č'* T15, *¢'* T165).

A certain amount of irregularity is evident with regard to whether or not a Tp language has an ejective consonant where expected. In fact, only one

segment, *k'*, is entirely consistent in this regard (excepting set T165, where *k'* appears in correspondence with Tot qV'). These sporadic gaps in ejective distribution are reminiscent of the sporadic loss of laryngealized vowels found in Tot languages noted above, and further underscores the link between laryngealized vowels and ejective stops and affricates in the family.

While in general *k* corresponds with *k*, and *q* corresponds with *q* in Tn languages, for most languages instances can be found in which *q* aligns with reconstructed *k (e.g., T2, 35, 39, 68, 161, 180) and, conversely, where *k* aligns with reconstructed *q (T7, 164). Much of this variation probably involves alternate forms of the same morpheme, one with *k* and one with *q* (e.g., Z *a'k-*, *a'q-* 'head'). Generally, these are lexically distributed allomorphs which probably owe their origin to a system of uvular harmony, still a synchronic process in M (MacKay 1994) and T (Watters 1988).[14] This process or a similar one in PTn may be responsible for *k* ~ *q* correspondences among reflexes of proto-forms in the daughter languages, although so far no systematicity in the distribution of the alternates is apparent. The realization of PTn *q is also affected by lenition processes, which in many daughter languages (U, and less consistently in T and H) lead to the segment being manifested as a glottal stop (Beck 2006, Smythe Kung 2007, and Watters 1980).

Two of the three lateral segments observed, *l* and *ɬ*, are consistent across the family (with a single known exception [T126]). The third lateral, *ƛ*, shows some variability, which seems consistent with its somewhat unusual nature in Tn (see Levy 1987 and Watters 1992 for discussion). In Tp, *ƛ has been lost (Watters 1992), becoming *t* or *t'* in a syllabic onset preceding a laryngealized vowel and *ɬ* in other environments. MacKay (1997) reports that reflexes of PTn *ƛ have become M *t*. Among the Central Totonac languages, PTn *ƛ has generally been retained except in U, which has neutralized PTn *ɬ and *ƛ to *ɬ*. Among the other languages of the Central group, PTn *ƛ may surface sporadically in individual words as *ƛ*, *ɬ*, *t*, *tl*, *ts*, or *t?* (for an extensive list of examples, see Levy 1987:37–41).

The nasal consonants are consistent in the cognate sets, although a few instances of *m becoming *n* (T62, 96, 159) are found. The latter may be of significance, since it groups the two Northern languages, U and A, against the others based on PTn **tum* 'one' (*tin* in U and A and also in Pn, another Northern language) and may represent an isogloss of possible use in classification.

Correspondences among reflexes of the two back fricatives, *x and *h, show some interesting patterns. As noted in **3.1**, the reconstruction of two back fricatives for PTn is a novel aspect of our proposal. While we view the

[14] Watters (1992) notes that in some languages *k* ~ *q* alternations are sound-symbolic (see **5.2.3**).

proposal as tentative, the comparative evidence examined thus far favors it, a conclusion reached independently by Davletshin (2008). More traditional PTn reconstructions have posited only a single back fricative (given as *x in Arana Osnaya 1953), reflecting the situation reported for most modern languages, which are described as having only a single phoneme of this type.

Unfortunately, not all sources for individual languages provide phonetic transcriptions of the single back fricative. It is transcribed as *h* for T (Watters 1988), H (Smythe Kung 2007), M (Mackay 1994; 1997), HT (Troiani 2004), and Z (Aschmann 1946). On the other hand, in FM (McFarland 2009), A (Reid et al. 1968), and U (and probably generally in the Northern branch of the family),[15] the back fricative is *x*, with allophonic variation in U to *h* in certain environments. Allophonic variation between *x* and *h* is also reported in H (Smythe Kung 2007:34), Ol (J. Tino, personal communication), Z (Aschmann 1946), and in P by Levy (1987), who gives the phoneme as *h* but offers no particular reason for favoring either allophone as basic (although she opts for *x* in her later grammatical sketch [Levy 1990]).[16] In C, however, McQuown (1990:38) posits separate *x* and *h* phonemes: the former is widely distributed, while the latter (excluding *h* added epenthetically by phonological processes) is rare and confined largely to word-initial position. Precisely the same pattern is reported in Oz by Román Lobato (2008:29).

As observed by Davletshin (2008), postulation of a single back fricative for PTn presents difficulties for explaining the diachronic development of a two-way distinction in back fricatives in C having the distribution just described. On the other hand, the observed distribution is consistent with the consonant correspondences outlined in table 1 showing that PTz *x becomes PTn *x across the board and PTz *h becomes PTn *h in initial position and Ø elsewhere. This would imply that C and Oz have preserved the PTn system, while other languages have neutralized the distinction between the two segments, favoring one of the back fricatives over the other. Of course, the distinction between *x* and *h* is sometimes subtle and, given the defective distribution of *h* in the two languages that maintain the contrast, further research may reveal that the pattern observed by McQuown and Román Lobato applies to other varieties as well. Alternatively, subsequent data may suggest other historical scenarios.[17]

[15] This assessment is Beck's, based on impressionistic observations of speakers from other Northern variants such as Zihuateutla and Tecpatlán. Gerry Andersen (p.c., 2010) reports the back fricative to be either *x* or *χ* in Tepetzintla.

[16] In the cognate sets given below, we have used *x* rather than *h* for Papantla forms, following the later practice, at P. Levy's request.

[17] Because only Coatepec and Ozelonacaxtla maintain the PTn *h ~ *x distinction, it is not always possible to reconstruct the specific PTn back fricative for words that begin with initial *x* or *h* in modern Totonacan languages unless reflexes from one of these two languages is available. We have reconstructed forms for which no such data is available with H in the cognate sets (**5.3**).

As noted in **3.1**, our phonological inventory for PTn includes a glottal stop, although this segment is not supported by any of our PTn ~ PMZ correspondences. Several Tn languages have been analyzed as having a phonemic *ʔ* over and above those glottal stops that have arisen from the loss of *q (noted above). However, in each of these cases the distribution of the segment is severely restricted (McQuown 1990, MacKay 1997, Watters 1988, and Smythe Kung 2007) or the analyses involve various kinds of complications indicating that postulation of phonemic *ʔ* is not without problems (Levy 1987:105, McFarland 2009:13–14, and Troiani 2004:33). Given the disparate distributions and analyses of glottal stop phonemes in various Tn languages, the reconstruction of PTn *ʔ is not clear-cut. Arana Osnaya (1953) does not include a glottal stop in her reconstruction, nor does Davletshin (2008). However, Levy (1987:63) believes it will eventually prove necessary to reconstruct PTn *ʔ. There seems to be some morphological evidence for this from certain nominalized verb forms, in U and P at least, and other evidence as well from M involving *ʔ* occurring stem-finally (MacKay 1997:42–45). For this reason, we have included *ʔ in the PTn inventory, although its existence or non-existence has no bearing on our proposed PTn/PMZ correspondences.

5.2.3. Sound symbolism. The final feature of Tn phonology that affects forms in the cognate sets is sound symbolism, a well-known and well-documented phenomenon in the family (Bishop 1984, Levy 1987:115–30, McQuown 1990:66, Watters 1980:121; 1992, MacKay 1997:113–14, Smythe Kung 2006, McFarland 2006, and Beck 2008). Sound-symbolic processes generally involve consonant alternations used to indicate increasing degrees of size, force, or intensity.[18] While some languages make use of *k* ~ *q* alternations (something P. Levy [p.c., 2009] suggests can be reconstructed for PTn), the most widespread sound-symbolic processes in the family involve fricative alternations—specifically, *s* ~ *š* ~ *ɬ* and, to a lesser extent, *ȼ* ~ *č* ~ *ɬ* and *s* ~ *ȼ*—in verbs, adjectives, adverbs, and ideophones. The result is pairs or triplets of forms such as U *saláx* 'broken into splinters', *šaláx* 'broken into shards', *ɬaláx* 'broken into pieces' and *lanʔs* 'hand striking hard', *lanʔš* 'fist striking with force', *lanʔɬ* 'blow striking with great force'.

As seen in these two sets, sound-symbolic fricatives may occur on either edge of a radical, and there is evidence (seen in pairs such as U *naˈpáˈpa*ˈ 'pale, whitish, pasty', *snaˈpáˈpa*ˈ 'pale but shiny') that the pre-radical consonants were in fact grade prefixes (*s- 'diminutive', *š- 'medium', *ɬ- 'augmentative'). The status of the post-radical segments is still uncertain, although evidence exists that these may have been suffixes (e.g., U *ču:noˈʔ* 'wrinkled', *ču:noʔš* 'wrinkled, shriveled'; C *puk-* 'smell (of rotten meat)',

[18] Also, cases of *a* ~ *i* alternations in stems that may be due to sound symbolism occur. This is attested most robustly in ideophones (see Beck 2008 for discussion and references).

TABLE 8
RECONSTRUCTED SOUND-SYMBOLIC FRICATIVES

*hak(S)- 'have an acrid or rotten smell'
*(S)kití 'grind to make tortilla dough'
*(S)kax 'sour, bitter'
*(S)pam- 'soft'
*pa'q(S)- 'break$_{TR}$'
*paq(S)- 'be born; sprout$_{V}$, flower$_{V}$'
*(S)pi'n- 'red'
*(S)pipí 'tremble, shake'
*(S)qa: 'harvest corn; shuck corn'
*(S)qu'tá 'knead'
*(S)ti:'t- 'tear, split, rip'
*(S)tiwí 'rock$_{TR}$, swing$_{TR}$'
*tu'k(S)- 'snap off, break off'
*(S)tu'nq- 'spread$_{TR}$, stretch$_{TR}$, extend$_{TR}$'
*tuq(S)- 'touch, feel, strike'
*(S)wa'tá' 'saw'
*(S)wiq '[repetitious noise]'

puksún 'smell [of rotten meat]', *pukłkún* 'smell [of excrement]'). Sound-symbolic processes, however, seem not to be active parts of synchronic word formation in most of the modern languages. In many of these, only parts (or single elements) of the sound-symbolic triplets have survived, individual languages differing with regard to which of the grades they have conserved.

Where elements in cognate sets in **5.3** lead us to reconstruct a sound-symbolic fricative consonant for the PTn form, and where the modern languages have conserved different grades of that form, we have indicated the sound-symbolic element in the reconstruction as "(S)" and discounted it for the purposes of alphabetization.[19] The forms from the cognate sets that are analyzed as containing sound-symbolic fricatives are given in table 8. In each of these examples, modern daughter languages either show variation with regard to which of the fricatives is found in their reflexes of the PTn form or individual languages have more than one of these fricatives. In one case, **paq(S)-* 'be born; sprout$_{V}$, flower$_{V}$', the sound-symbolic fricative is reconstructed based on its absence in the T reflex, *paq-*, although the fricative is *ɬ* in the other languages. In two cognate sets, **likš-* 'to shake, vibrate' (T46) and **pi'nkš-* 'pinch' (T88), it seems plausible from a semantic point of view that the stem-final consonant is sound-symbolic, but we have no evidence of variation and so have reconstructed the final fricative as part of the

[19] In the cognate sets for PTz, we have not included "(S)" for those PTn forms for which it is reconstructed in **5.3**.

stem, enclosed in braces in the PTz cognate sets (Tz44 and 80) given in **6**. An additional form, **ta'nks-* 'straight, correct' (T147, Tz148), occurs which also has a stop + fricative coda cluster not reconstructible for PTz. The semantics of this stem are less obviously combinable with the grade-suffixes, although it is certainly not inconceivable that this is the origin of the unexplained {s} portion of our PTn reconstruction.

5.3. Totonacan cognate sets. Below are given the cognate sets which are the basis for the reconstructed PTn forms included in Totozoquean sets in **6**. Suggested meanings are presented for the reconstructed forms. When the gloss given in original sources for an individual language reflex is substantially different from, or more specific than, the meaning assigned to a respective PTn form, this is indicated by a gloss immediately following the individual language reflex. In some cases, forms have been changed from those in the original sources in the interest of standardizing the presentation; where possible, inflectional affixes have been removed to allow more direct comparison with reconstructed stems.

Totonacan Cognate Sets

(T1) *-čuqú 'stop', 'stopped' | U *-čo'ʔó*, *tačo'ʔó* 'stop'; A *tačoqó* 'stay; get stuck (in a net)'; FM *čoqo* 'stop'; Ol *tačuqú* 'stop'; Z *tačoqo* 'stop'; Co *tačoqó* 'stop and refuse to go on'; P *tačoqó* 'take shelter; stop; go back; have second thoughts'.[20]

(T2) *-ki:' 'lift' | M *ma:kí:'*; U *ma:'ʔakí:*; A *ma:'qaki:'*, *ta:ki:'* 'get up (someone lying down)', *ʔi:* 'harvest'; FM *ma:ki:'* 'pick up; put away'; Ol *ma:ké* 'pick up'; Z *ma:ki:'*, *ta:ki:'* 'get up'; Co *ta:kí:'* 'get up'; P *taki:'* 'get up', *ki:'* 'harvest (crop)'.[21]

(T3) *-qi:' 'opened (bottle, pot), uncovered' | T *laqɬtiʔa:* 'be open'; Pf *ɬtiʔa:* 'be open'; U *-ʔe:* 'uncovered'; A *ma:'qe:'* 'open$_{TR}$ (bottle, pot)'; FM *qaɬqe:'* 'be open (lid)', *taqe:'* 'open (lid)'; Ol *ma:qaɬqá* 'open$_{TR}$'; Z *qaɬqa:'* 'be open/uncovered (bottle, pot)'; Co *laqaqé:'* 'open$_{INTR}$ (book)', *ma:laqaqé:'* 'open$_{TR}$ (book)'; P *taqaɬqé:'* 'be opened/uncovered (bottle, pot)', *ma:qaɬqé:'* 'open$_{TR}$ (bottle, pot)'.

(T4) *-¢i:' 'tight, closed, blocked' | U *-¢i:*, *la'ʔ¢í:* 'be fine (mesh), *tapis¢í:* 'be hoarse, have a sore throat'; A *tapiš¢í* 'throat (*piš-*) closes up';

[20] In this and the following forms, the hyphen indicates a bound verbal root.

[21] These forms are given with short finals in the original (Aschmann 1973*a*), although they are amended by P. Levy as *taki:'h*, and *ki:'h*, respectively, in her annotations to the Aschmann dictionary. We have followed Levy (1987) in considering final *h* to be due to the devoicing of a long final vowel rather than a phonemic segment /h/. We have applied the same considerations to a few other forms with long accented final vowels given in cognate sets below which are short in Aschmann (1973*a*) and *h*-final in Levy's amendments thereto.

Ol *tapis¢é* ‘have a sore throat (*pis-*)’; Z *laq¢i:*ˈ ‘be crowded or blocked off’; P *laq¢i*ˈ ‘be crowded or blocked off’, *tapiš¢i*ˈ ‘get hoarse’, *tapis¢i*ˈ ‘get hoarse’.

(T5) *-wi:t ‘twisted, winding, curved’ | H *taʔašqawi:t’i* ‘curving’, *ʔašʔawi:t* ‘curve’, *witi* ‘turn in a circle’; P *łqaˈwi:ta* ‘twist (wire or stick to bend it)’.

(T6) *-xu: ‘into downward’ | T *muhú:* ‘stick down into (an enclosed place)’, *tahú:* ‘go down into’; H *-hu*; M *tu:hú:* ‘go inside’; U *-xu:* ~ *-xo:*; A *taxu:* ~ *toxo:* ‘come in’; FM *mu:xu:* ‘put into; serve coffee’, *taxu:* ‘get into a depth’; Ol *tahé* ‘go down in’, *muhú* ‘put in’; C *-xu:*; Z *muhu:* ‘put underneath; toss’, *tahu:* ‘come in from below; stick in’; Co *tahu:* ‘go inside moving downward’; P *muxú* ‘put or throw inside moving downward; bury; put under water’, *tahú* ‘come in from above moving downward’.

(T7) *aqa- ‘ear; the part of something that sticks out’ [meronymic prefix][22] | T *ʔaqa-*, *aqašqol* ‘ear’; Pf *ʔaʔašʔoł*; M *qaˈqaˈšquł* ‘ear’; U *aˈʔa-*; A *aˈqawa:naˈn* ‘hear’, *aˈqaˈšqoˈł* ‘ear’; Pn *aqašqoł* ‘ear’; FM *aqa-*, *taqe:n* ‘ear’; Ol *taqá:n* ‘ear’; Oz *taqe:n* ‘ear’; Z *aˈqawa:nan* ‘hear’, *taqa:n* ‘ear’; C *ʔaqa-*; Co *aqa-*; P *aka-*, *aqa-*, *taqa:n* ‘ear’.

(T8) *ča: ‘ripen’ | T *ča:* ‘ripen; cook$_{INTR}$’; H *č’a:* ‘ripened’; M *ča:n*; U *čaá:* ‘ripen; cook$_{INTR}$’; A *ča:* ‘ripen; cook$_{INTR}$’; FM *ča:* ‘ripen; boil (food)’; Ol *ča:* ‘cook$_{INTR}$’; Z *ča:*; C *ča:-*; Co *ča:n*; P *čá.*

(T9) *čá:ˈkał ‘type of fly’ | U *kał* ‘insect eggs’; Ol *čákał* ‘worm’; Z *ča:ˈkał* ‘maggot; minnow’, *ma:ča:ˈkałna*ˈ ‘bluebottle fly’; P *čá:ˈkał* ‘maggot-producing fly’.

(T10) *čá:ˈmu:n ‘tumpline’ (derived from PTn *čaˈx ‘rope’ + *mu:n ‘forehead’) | FM *mu:n* ‘tumpline’; Z *ča:ˈmun*, *mu:n* ‘forehead’; P *ča:ˈmú:n*, *mu:n* ‘forehead’.

(T11) *čaqa:- ‘house’ | T *čaqá*; H *čaqaʔ* ‘home’; U *čaˈʔa:-* ‘interior (of building)’, *čaˈʔá:n* ‘tie beam (of house)’; A *čaqa:n* ‘tie beam (of house)’; P *čaqá:ˈn* ‘interior of a house, open space inside a house’.

(T12) *čaˈqá:ˈ ‘wash’ | T *čaʔa:*; Pf *čaˈʔa:*; H *č’aqa*; M *čaˈqá:*ˈ; U *čeˈʔé:*; A *čeˈqe:*ˈ; FM *čaqan* ‘wash oneself’, *čeqé:*ˈ ‘wash something’; Ol *čaqá* ‘wash something’; Z *čaˈqa:*ˈ; C *čaqa:*; Co *čeˈqé:*ˈ, *čaˈqá:*ˈ; P *čaˈqé*ˈ, *čaˈqa*ˈ.

(T13) *čaqš- ‘cut off, cut down, snap off’ | T *čaqš-* ‘snap off (to break off forcibly)’; H *čaqš-* ‘cut, cut down, fell, cut with a machete’.

[22] Totonacan languages make extensive use of prefixal forms of body parts for a variety of grammatical processes. Historically, independent nominal terms for body parts were produced from these forms combined with a suffix *-*n* ~ *-*niˈ*.

(T14) *čaxí':t 'hail' | T *čah?i:t*; H *čah?i:t* 'little balls of ice'; M *čéhet*; U *čexé:t*; A *čexet*; FM *čaxa:nan* 'hail$_V$'; Ol *číhit*; Z *čihi:t*; Co *čé:hé:t*; P *číxi:t*.

(T15) *či:ˈ 'tie, tie up' | T *č'í:*, *č'i:mu:k'á*; H *č'i:*, *č'inu:*; U *či*; A *či:ˈ*; FM *či:ˈ*; Ol *če:*; Z *či:ˈ*; C *či:-*; Co *či:ˈ*; P *čiˈ*.

(T16) *čí:naˈ 'pus' | M *či:n*; U *čí:naˈ*; A *či:naˈ*; Ol *čí:ˈna?*; Z *či:naˈ*; P *či:n* 'pus; bodily fluids'.

(T17) *čik 'house, home' | U *čik*; A *čik*; Ol *čik*, *čike?*; Z *čikiˈ*; C *čik*; Co *čik*; P *čiki*, *čik*.

(T18) *čiˈntáˈ 'kick' | T *č'intá:*; H *č'int'a*; U *čiˈntá*; A *čiˈntá*; Z *čiˈntaˈ* 'crush'.

(T19) *čiˈpá ~ čaˈpá 'grab, grasp' | T *č'apá*; H *č'apa*; M *čaˈpá*; U *čiˈpá*; A *čiˈpá*; FM *čipa*; Ol *čapá*; Z *čiˈpa*; C *čapa-*; Co *čiˈpá*; P *čiˈpá*.

(T20) *čiqí 'tear, break' | T *če?e*; U *če'?é*; Co *čeqé*.

(T21) *čiˈt- 'wring out, grind' | T *č'it-*'grind'; H *č'it-*; M *čiˈt-* 'wring out'; U *čiˈt-* 'wring out; mill sugarcane'; A *čiˈt-* 'wring out', *čiˈtnin* 'mill sugarcane'; FM *čit-*; Ol *čit-*; Z *čiˈt-* 'wring out'; Co *laqčiˈt-* 'wring out'; P *čiˈt-* 'wring out; extract juice; mill sugarcane'.

(T22) *čiwí: 'speak' | T *čiwi:ní*; H *čiwinti* 'word'; M *la:čiwí:n* 'word'; U *čiwi:nán*, *tačiwín* 'word; language'; A *čiwi:naˈn*, *tačiwi:n* 'word; voice'; FM *čiwi:nan*; Ol *čuwenán*, *čuwinán*; Z *čuwi:nan*, *tacuwi:n* 'word'; C *čiwi:-*, *tačiwi:n* 'word'; Co *čuwi:nán*, *tačuwí:n*; P *čiwi:nán*, *tačiwí:n* 'word, speech'.

(T23) *ču:ˈn 'vulture' | T *č'u:n*; H *č'u:n*; U *čú:ˈni*ˈ; A *ču:ˈni*ˈ; Ol *čon*; Z *ču:ˈn*; C *ču:n*; Co *ču:ˈn*; P *ču:ˈn*.

(T24) *(aˈq)čuqú 'move around; take a walk' (aˈq- 'head') | T *ti:čoqoˈan* 'go backward', *-čoqo* 'again' [verbal suffix]; U *-aˈ?čoˈ?ó:* 'move around', *taaˈ?čoˈ?ó:* 'take a walk'; A *ta:ˈqčoqó* 'take a walk'; FM *talaqčoqo* 'take a walk'; Ol *ta:qčuqú*; Z *aˈqčoqolapu:la* 'take a walk', *ta:qčoqo* 'take a walk'; Co *talqčoqó* 'take a walk'; P *ta:qčoqó* 'go around from place to place'.

(T25) *čuh- 'spit' | T *čuh?u-* (*?u* 'eat'); H *čuhnu*, *čuhwa* 'spit out'; U *čox-*; A *čoxnuˈn*; FM *čux-*; Ol *čuh-*; Z *čuh-*; C *čuh-*; Co *čuh-*; P *čux-*.

(T26) *hi:qi 'yes' | H *hi:*; U *xe*; C *hi?í:*; Co *héhe*; P *xe?é*.

(T27) *Hak(S)- 'have an acrid or rotten smell' | T *haks-*; H *hakš-*; U *xaksán*, *xakšán*; A *xaks-*; Ol *haks-*; Z *haks-*; P *xaks-*. (H = unspecified back fricative; see n. 22 above.)

(T28) *Haláˈ 'grind (corn)' | U *xalá* 'break in a grinder (esp. corn)'; A *xalaˈnan*; P *xalá* 'grind just to break the skin (corn)'.

(T29) *Halá'n 'embers' | H *ma:halan*; U *xalanát*; A *xalaˈnat*; Ol *halanat*; Z *halaˈnat*; Co *halánat*; P *xalánat*.

(T30) *Hik- 'fire' | T *híkmi*; Pf *hikmi*; H *hipi*.

(T31) *Hikswá' 'drown' | U *xikswá:*; A *xikswá'*; FM *xi:kswa* 'choke'; Ol *hi:kswán*; Z *hikswa'*; Co *hikswá'*; P *xikswá'n*.

(T32) *ka:'- 'place of' [locative prefix] | U *ka:'-*; A *ka:'-*; Z *ka:'-*; C *ka:* 'concerning an extensive horizontal surface'; Co *ka:'-*; P *ka:'-*.

(T33) *ka:š 'fixed, prepared' | U *ka:š* 'ready, prepared, well set up'; A *ka:šni'x* 'ready', *ka:šwi'* 'be prepared'; Ol *taká:š* 'get ready'; Z *ka:š-* 'well set up'; Co *ka:š* 'be well set up', *ka:šlá* 'be fixed'; P *ka:šlá* 'be prepared, be remedied, be fixed, improve'.

(T34) *ká'ka 'amaranth, edible greens' | A *ka'kán* 'papaloquelite'; FM *káka'* 'edible greens'; Ol *káka*; Z *ká'ka* 'amaranth'; C *kaka* 'edible greens'; P *ka'ka* (cf. *¢awa').

(T35) *kan- 'savory, delicious' | T *kan*; H *kan*; U *káni'*; A *kani*; FM *qama'*; Ol *qáma?*; Co *qáma*; P *qáma*. [Note: The /q/ in the Lowland-Sierra form may be due to sound-symbolic alternation (see **5.2.3**).]

(T36) *(S)kax 'sour bitter' | T *skah*; H *sqah*; U *škax* 'pineapple'; A *ška'x* 'pineapple'.

(T37) *ki:- 'go and return' [verbal prefix] | T *ki:-*; H *ki:-*; U *ki:-*; A *ki:-*; FM *ki:-*; Ol *ki:-*; C *ki:-*; Co *ki:-*; P *ki:-*.

(T38) *kił- 'mouth' | T *kiłna*; H *kił* 'snout; lip'; M *kíłni'*; U *kíłni'*; A *kiłni'*; FM *kíłni*; Ol *kíłne?*; Z *kiłni'*; C *kiłni*; Co *kił-*; P *kiłni*.

(T39) *kin- 'nose' | T *kanka-*; H *kinka* 'point, tip'; M *ki'?*, *qi:n-*; U *kíni'*, *kinka-*, *?en?a-*; A *kini'*, *kinka-*, *qanqa-*; Pn *kini'*; FM *kinkán*; Ol *kankán*; Oz *kankan*; Z *kinkan* 'nose; point'; C *kankan*; Co *kinkán*; P *kinkán*.

(T40) *ki'spa' 'corn (kernels)' | T *k'ispa* 'corn kernels (dry)'; M *kí'spa'* 'corn' (cf. *kúši').

(T41) *(S)kití 'grind on metate' | T *skití*, *skititi* 'tortilla dough'; H *skiti* 'grind, blend', *skitit* 'tortilla dough, dough'; M *skití* 'grind'; U *ski'ti* 'work tortilla dough', *taskí't* 'tortilla dough', *xki'tí* 'crush'; A *skití* 'grind', *taskit* 'tortilla dough'; FM *skiti*, *škití* 'crush; grind on metate'; Ol *skití*, *maskitinən* 'make grind'; Z *skiti*; C *skiti-* 'grind'; Co *skití* 'grind'; P *skití*, *skítit* 'tortilla dough; flour', *škití:* 'squeeze'.

(T42) *kí'wi' 'tree, wood, firewood, stick' | T *k'iw* 'wood'; Pf *k'iw* 'tree'; H *k'iw*; M *ki'?* 'tree'; U *kí'wi'*; A *ki'wi'*; Pn *kiwi'*; FM *kiwi'*; Ol *kíwe?*; Oz *ki'w*; Z *ki'wi'*; C *kiwi* 'tree'; Co *kí'wi* 'tree'; P *ki'wi*.

(T43) *kúši' 'corn (maize), corn kernels' | T *kuši* 'corn'; H *ku:š*; U *kú'ši'*; A *kuši'* 'corn kernels (dry)'; FM *kúši'*; Ol *kúše?*; Z *kuši'*; C *kuši*; Co *kuši'*, P *kuši'* (cf. *kí'spa').

(T44) *la:pán 'person' | T *lapána:ki*; H *lapanak*; U *la:páni:'* 'wild carnivorous animal'; Ol *la:pánit*; Z *la:'pani:t* 'wild animal'; Co *la:páni:t* 'wild animal'; P *la:páni:t* 'wild animals that kill to eat'. [Note: The

original meaning of the PTn word was probably ‘person’, which in most modern Totonacan languages is now *kristiano* (from Spanish *cristiano*); in post-contact times the word was extended to ‘wild animal’, related to the common understanding that non-Christian (non-baptized) persons were “savage” and “wild.”]

(T45) *lamá ‘flame$_V$, burn’ | H *lam lam* ‘tongue of fire; flickering light; motion of waves in the ocean’; U *lamá* ‘burn, catch fire’; A *lamá*; FM *láma láma* ‘flickering fire’; P *lamaná* ‘flame, bonfire’.

(T46) *likš- ‘to shake, vibrate’ | U *li'kšli'kš* ‘something sounding so loud that it shakes’; Ol *likš-*; Z *likšnan* ‘jump, vibrate’; P *likša* ‘shake$_{TR}$, hit’.

(T47) *lú:qu' ~ *lú:'qu' ‘throat; swallow$_V$; egret or heron (long-necked bird)’ | T *talóq* ‘swallow$_V$’, *pa:talóqni* ‘throat’; H *t'uloq* ‘gulp down’, *sloqoti* ‘type of bird’, *pat'uloq* ‘esophagus of a bird’, *šnapapa lo:qoqo* ‘heron’ (*šnapapa* = ‘white’); U *lo:?lo:?* ‘gulping, swallowing whole’, *šlo:?šlo:?* ‘a bird swallowing’, *slo:?slo:?* ‘small object being gulped down (e.g., pill)’, *ló?o* ‘egret’; A *lo:'qo* ‘egret’; Ol *lú:qu?*; Z *lo:'qo'* ‘egret’; P *lo:qo'* ‘egret’, *lo:qo:t* ‘larynx’. [Note: The words for ‘egret’ may be nominalizations of a verb meaning ‘swallow’ produced by a suffix *-? that has the effect of shifting stress leftward and laryngealizing the final vowel in the stem. If so, the laryngealization of the vowel in the first syllable may be due to regressive assimilation of creaky voice, and the PTn form would be better reconstructed as *lu:qú.]

(T48) *lú'šu' ‘cloth, clothes’ | U *lú'šu'*; A *lu'šu'* ‘dress’; Z *lu'šu'* ‘cloth, rags’; P *lušu* ‘handkerchief, kerchief, cloth’.

(T49) *łka: ‘measure$_V$’ | T *łka:*; H *łka:*; M *łka:*; U *łka:*; FM *łka*; A *łka:*; Z *łka:*; Co *łka:*; P *łka:*.

(T50) *łqut- ‘braid$_V$’ | H *łqot-*; Z *łqoti* ‘make crooked, warp’; P *łqotili* ‘warped, bent, wavy’, *ma:łqotí* ‘bend, put curves in’ (cf. *qu'nqš-).

(T51) *łta'lá ‘red hot, burning’ | Z *łtala*; P *łta'lá*.

(T52) *łú:wa' ‘much, many’ | T *łúwah*, *łuw*; H *łu:*; M *łu?*; U *łú:wa'*; A *łu:wa'*; FM *łú:wa*; Ol *łúwa?*; C *łu:wa*; Co *łú:wa*; P *łu:wa*.

(T53) *ƛank- ‘big, more’ | Ol *ƛánka?* ‘big’; Z *ƛanka'* ‘big’, *ƛanka'nan* ‘flood$_V$’; Co *ƛanga*, *ƛanka'*; P *ƛanka'nán* ‘flood$_V$’.

(T54) *ƛax- ‘earn, win’ | T *ƛaha:*; U *ƛaxá*; A *ƛaxá*; FM *ƛaxá*; Ol *ƛahá*; C *ƛaxá*; Z *ƛahá*; Co *ƛahá*; P *ƛaxá*.

(T55) *ma:' ‘be lying down’ | T *ma:ł*; Pf *ma:ł*; H *ma:ł*; M *ma:'ł*, *tamá:'* ‘lie down’; U *ma:ł*, *tamá:* ‘lie down’; A *ma:'*; FM *ma:'*; Ol *ma:*; Z *ma'h*; C *ma*, *tama:-* ‘lie down’, *pu:tama:* ‘lie down on’; Co *mah*; P *ma:*.

(T56) *ma¢át ‘salt’ | T *má¢ati*; H *ma¢at*; M *má¢at*; U *ma¢át*; A *ma¢at*; FM *má¢ati*; Ol *má¢at*; Z *ma¢at*; C *ma¢at*; Co *má¢at*; P *má¢at*.

(T57) *maka- ‘hand’ | T *maka:*; Pf *maka?*; H *maka?*; M *makála't*; U *makán*; A *makan*; FM *makan*; Pn *makan*; FM *makan*; Ol *makán*; Oz *makan*; Z *makan*; C *makan*; Co *makán*; P *makán*.

(T58) *ma'ƛ- ‘bamboo’ | T *mátak'i*; U *ma:łú:k*; A *ma'ƛu:'k*; FM *máƛuki*; Ol *máƛuk*; Z *ma'ƛu:'k*; Co *máƛu:'k*; P *máƛu:'k*.

(T59) *ma'ntáx ‘sweet potato’ | T *mantah*; H *má:nta:*; M *spa:tamúntał*; U *mantá'j*; A *ma'ntax*; Ol *mánta*; Z *ma'ntah*; C *manta*; P *mántax*.

(T60) *maqá:n ‘old, ancient’ | T *maqa:n* ‘long time’; H *maqaniya:* ‘ancient; a long time (ago)’; M *maqá:'n* ‘old’; U *ma'ʔá:n*; A *maqa:n* ‘for a long time, a long time ago’; FM *maqá:n* ‘old, ancient, a long time ago’; Ol *maqán*; Z *maqa:n*; Co *maqá:n*; P *maqá:n* ‘before, a long time ago’.

(T61) *min ‘come’ | T *min*; Pf *min*; H *min*; M *min*; U *min*; A *min*; Pn *min*; FM *min*; Ol *min*; Oz *min*; Z *min*; C *min*; Co *min*; P *min*.

(T62) *mispá: ‘know’ | T *mispá:* ‘know how to, know’; H *mispa:* ‘know, meet; read; confirm, to prove’; M *nispá:* ‘be familiar with’.

(T63) *munqá: ‘covered in dew’ | U *monʔa:'n* ‘get damp’, *monʔá:'wa* ‘wet, damp’; A *mo'nqa:'wa'* ‘damp’; FM *monqa:nan* ‘fall (dew)’; Ol *manqaná?* ‘dew’; Z *monqa* ‘get wet, be covered in dew’, *monqa:na'* ‘dew’, *monqa:nat* ‘dew’; P *monqá:* ‘be covered in dew; dew falls’, *monqwa* ‘damp’, *monqa:ná* ‘dew, the damp’.

(T64) *mu'nú: ‘make wet’ | U *mu'nú:* ‘pour water into something’; A *mu'nu:* ‘spray, put water on’; FM *munu:*; Ol *munú* ‘baptize’; Z *mu'nu* ‘spray, wet, baptize’; C *munu* ‘spray, wet, baptize’; Co *munu* ‘spray, wet, baptize’; P *munú:* ‘spray, throw water, get something wet, baptize’.

(T65) *mú'sni' ‘spring (water)’ | U *mú'sni'*; A *mu'sni'*; Co *músni*.

(T66) *nanq ‘having to do with water’ | H *šnaʔ šnaʔ* ‘of falling water’; U *nanʔáx* ‘watery’; Z *na'nqa:n* ‘stagnant water’; Co *tananqa'ƛ-* ‘have waves (water)’; P *nanqa:n* ‘lagoon’.

(T67) *nápa ‘aunt’ | U *nap*; A *nap*; FM *nápa'*; Ol *nápa*; Z *napa*; C *nápa*; Co *napa*; P *napa*.

(T68) *naq- ~ *nik- ‘beat, hit’ | T *naq-*; H *naq*; U *nik-* ‘hit with stick’; FM *nik-* ‘hit with stick’; Z *nik-*; Co *nik-*; P *nik-* (cf. *niq-).

(T69) *ni: ‘negation’ | H *ni:*; Ol *ni:*; Z *ni:*; C *ni:*; Co *ni:*; P *ni:*.

(T70) *nípši' ‘squash’ | T *niwkši*; H *nipš*; M *nípši*; U *nípši'*; A *nipši'*; FM *nípši*; Ol *nípše?*; Z *ni'pši*; C *nipši*; P *nipši'*.

(T71) *pá:qa' ‘Brown Jay’ | T *pá:ʔa* ‘Brown Jay’; H *paqa* ‘type of bird’; U *pá:'ʔa'*; A *pa:qa'*; Ol *pí:qaʔ*; Z *pa:qa'*; P *pa:qa'*.

(T72) *(S)pam- ‘soft’ | Pf *pamał*; U *spamáma* ‘velvety, mossy’, *łpaˈmáma* ‘cuddly, soft and furry’; A *spampalaˈ*; Ol *spamám*; Z *spamam* ‘soft and white, fluffy’; P *spamam* ‘soft and white’.

(T73) *panq- ‘burst, explode’ | H *p’a?* ‘thunder’; U *pan?-* ‘make a loud bang, burst’; A *panq-* ‘it bursts’; FM *panq-* ‘explode’; Ol *panq-*; Z *panq-* ‘explode, crack, shatter, burst’; C *panq-* ‘explode’; Co *panq-* ‘explode, crack, shatter, burst’; P *panq-* ‘crack, shatter, explode, burst’.

(T74) *papáˈ ‘moon, month’ | M *pap* ‘moon’; U *pap*; FM *papá:ˈ* ‘moon, month’; Ol *papá?*; Z *papaˈ*; C *papa* ‘moon’; Co *papá* ‘moon’; P *papáˈ*.

(T75) *paˈq(S)- ‘break$_{TR}$’ | T *paq-* ‘burst$_{INTR}$’; U *paˈ?ł-*, *paˈ?špaˈ?š* ‘person crunching food’; A *paˈqł-*; FM *paˈqł-*; Ol *paqł-*; Z *paˈqł-*; Co *paˈqł-*, *paˈqš-* ‘making a dry sound’; P *paˈqł-* ‘break something into pieces’, *paˈqš-* ‘peel something’, *paˈqs-* ‘peel something (coffee, egg)’ (cf. *paq(S)-). [Note: The form *paˈqł- and the following PTn stem have become homophonous in several daughter languages, most likely because of the plausible metaphorical link between ‘bloom, sprout’ and ‘break’ (i.e., that flowers, seeds, etc., break open when they start to grow). In T, the short laryngealized vowel in the reflex of *paˈq(S)- has become modal and the stem is intransitive. In U and P, the modal vowel of *paq(S)- has become laryngealized but the different valencies of the PTn forms have been conserved; the reflexes of the two verbs continue to be distinct in A, FM, and Z.]

(T76) *paq(S)- ‘be born; sprout$_{V}$, flower$_{V}$’ | T *paq-* ‘be born’, *ma:paʔa:* ‘make explode’; U *paˈ?ł-* ‘bloom, flower’; A *paqł-* ‘flower, sprout (corn); be cultivated’; FM *paqł-*; Ol *paqł-*; Z *paqł-* ‘sprout (flower)’; P *paˈqł-* ‘flower, open (flower), sprout’ (cf. *paˈq-).

(T77) *paqa- ‘arm, wing, branch’ | T *paqáčuh* ‘wing’; H *pa:qaču* ‘feather; fish fin’; U *peˈ?én* ‘arm; wing; foreleg of a quadruped; sleeve’; A *peqen* ‘arm; branch; wing; shoulder (animal); fin (fish); sleeve (dress)’; Ol *páqneʔ*; Z *paqan* ‘bird; wing’; C *paqátu* ‘arm’; Co *peqe-* ‘arm’; P *paqán*, *paqén* ‘arm; wing; pin feather; fin; branch; handle’.

(T78) *paš- ‘bathe$_{INTR}$’ | T *paš-*; H *paš-*; M *paš-*; U *paš-*; A *paš-*; FM *paš-*; Ol *paš-*; Z *paš-*; C *paš-*; Co *paš-*; P *paš-* ‘bathe$_{INTR}$’.

(T79) *pikš- ‘itch$_{V}$’ | U *pikšnín* ‘have an itch’; A *pikš-* ‘cause itching’.

(T80) *piˈn ‘chili pepper’ | T *p’in*; H *p’in*; M *piˈn*; U *piˈn*; A *piˈn*; FM *piˈn*; Ol *pin*; Z *piˈn*; C *pin*; P *piˈn*.

(T81) *(S)piˈn- ‘red’ | U *łpiní:n* ‘red of wine or blood’, *spiˈnénʔe:ˈ* ‘orange-red’; A *spiˈnenqeˈ* ‘red’; FM *špinín* ‘intense red’; Ol *spiní:n*; Z *piˈnin* ‘red’; C *pini:n* ‘bright red’, *spini:n* ‘pink’; P *piˈnini* ‘pink, light red’.

(T82) *piˈnkš- ‘pinch’ | U *piˈnʔš-*; Z *piˈnkš-*.

(T83) *(S)pipí ‘tremble, shake’ | T *škapiknin*; H *łkipipi*; U *łpiˈpéˈ?* ‘trembling with emotion’, *špiˈpí* ‘tremble’; A *łpipeq la* ‘be startled’ (*la* ‘do’); FM *łpipi* ‘tremble’; Ol *łpipí*; Z *łpipi*; C *łpipi*; Co *łpipí*; P *łpipaq* ‘startled, shaken, afraid’, *łpipí* ‘shake$_{TR}$’.

(T84) *pisí:s ‘Elephant Ear (plant with edible tuber)’ | U *pisí:s*; A *pisisi* ‘cassava, yucca’; Ol *písis*; Z *pisi:s*; P *pisi:s*.

(T85) *pu:čí:ˈ ‘rot$_V$’ | T *pu:č’í:*, *pu:č’i:ní* ‘rotten’; H *p’u:č’i*, *p’uč’i* ‘rot$_N$’; M *pu:číˈ?* ‘rotten log’; U *pučíˈ* ‘rotten log’; A *puˈčiˈwaˈ* ‘gnawed, bug-eaten, rotten (wood)’ (*wa* ‘eat’); P *pu:číˈ* ‘rot (wood or plant)’.

(T86) *pu:ƛ ‘mud’ | T *puɬ?an* ‘mud’; H *puɬqom* ‘mud, clay’; U *pu:łú:n*; A *pu:ƛu:ˈn*; FM *pu:ƛún*; Ol *pu:ƛón*; Z *pu:ƛu:ˈn*; Co *pu:ƛu:ˈn*; P *pu:ƛú:ˈn*.

(T87) *pu:šú: ‘drizzle$_V$’ | T *pu:šwa:* ‘spray$_V$’; M *pu:šunúˈ?* ‘rain$_N$’; U *pušunúˈ* ‘drizzle$_N$’, *pušúm* ‘drizzle$_N$’; A *pu:šunúˈ* ‘drizzle$_N$’; Z *pušu:nan*, *pušu*, *pušu:n* ‘drizzle$_N$’; P *pušu:m* ‘drizzle’.

(T88) *puˈč- ‘tear, break, snap (something long and thin)’ | U *puˈčéˈ?š-* ‘break up something crumbly’; Z *puˈč-* ‘tear, break (thread)’; Co *lakpúˈtš-* ‘break into pieces’; P *puˈč-* ‘tear (thread, twine, creeping vine)’.

(T89) *púˈk(S)- ‘smell rotten, stink’ | T *p’uks* ‘foul smell’; H *p’uks-*; U *púˈksaˈ* ‘smelly’; A *puˈksa* ‘stinky’; FM *puks-*; Ol *puks-* ‘stink’; Z *puˈksa* ‘fetid smell’; C *puk-* ‘smell (of rotten meat)’, *puksún* ‘smell (of rotten meat)’, *pukłkún* ‘smell (of excrement)’; Co *puˈksán*; P *puˈksa* ‘stinky, smelly’.

(T90) *punqú ‘bubble, bubbly, foamy’ | T *poqóqo* ‘bubble, balloon’; U *pon?ó:ˈx*; P *sponqó* ‘make soap; soap something; make clothes foamy’.

(T91) *pupú ‘boil$_V$’ | T *pu:pú*; H *pu:pu:*; M *qa:ˈqpúput* ‘froth’; U *pupú*; A *pupú*; FM *pupu*; Ol *pupú*; Z *pupu*; C *pupu*; Co *pupú*; P *pupú*.

(T92) *puq ‘gourd’ | A *tampo:q* ‘gourd’; P *poqeˈ* ‘gourd’.

(T93) *puˈqš(niˈ) ‘dust’ | T *p’óqšni*; H *poqšni* ‘pollen’; U *póˈ?šniˈ*; A *poqšniˈ*; Ol *púqšne?*; Z *poˈqšniˈ*; Co *póqšni*; P *poˈqšni*.

(T94) *puˈquˈ ‘belly, stomach’ | U *póˈ?oˈ*; A *poˈqoˈ*; Ol *pú:qu?*; Z *poˈqoˈ*; C *puqu*; Co *póˈqoˈ*; P *poˈqoˈ*.

(T95) *puˈš- ‘pick (fruit), tear off ’ | T *p’uš* ‘take off of a branch’; H *p’uš-* ‘pick, cut down’; M *puˈš-* ‘pick’; U *puˈš-* ‘pluck, tear off with force’; A *puˈš-* ‘pick (fruit from a tree)’; FM *puš-* ‘pick (fruit from a tree)’; Ol *puˈš-* ‘pick’; Z *puˈš-* ‘pick’; Co *puˈš-* ‘pick or harvest (coffee, fruit)’; P *puˈš-* ‘pick or loosen by the stem’.

(T96) *puˈšám ‘twenty’ | T *p’u:šawn*; H *p’u:šam*; U *puˈšam*; A *puˈšam*; FM *pušam*; Ol *pušúm*; Z *puˈšaˈm*; C *pušam*; Co *puˈšáˈm*; P *puˈšúm*.

(T97) *(S)qa: ‘harvest corn; shuck corn’ | T *šqa:* ‘pick corn’; H *šqa:* ‘shuck corn’; M *šqa:* ‘harvest (corn)’; U *š’a:* ‘shuck corn’, *s’a:*

'crack something'; A *šqa:* 'rip; shuck (corn)'; FM *šqa:nan* 'shuck corn'; Ol *šqa* 'split something'; Z *šqa:* 'shuck corn', *sqa:* 'split something, divide something'; C *šqa:* 'rip, shuck (corn)'; Co *šqa:nán* 'harvest (corn)', *tasqa:* 'split$_{INTR}$'; P *šqá* 'shuck (corn)', *sqa:* 'split something'.

(T98) *qá:ˈti: 'plant with hollow stem' | T *aktiya:ti*; U *a:ˈti:yá:k* 'Spanish Cane; flute'; A *qa:ˈtiˈya:ˈt*; Ol *qá:tit*; Z *qa:ˈti:t*; Co *qá:ˈti:t* 'plant with hollow stem; caña del río (plant)'; P *qá:ˈti:t* 'plant with hollow stem; caña del río (plant)'.

(T99) *qaˈší 'strike with hand' | FM *qaši*; Ol *qaší*; Z *qaˈši*; Co *qaˈší*; P *qaˈši*'.

(T100) *qašmát- 'hear' | T *qasmát-*; Pf *ʔasmat-*; H *qasmat-*; M *qašmát-*; U *ʔešmáˈt-* 'hear; understand'; A *qašmat-*; Pn *qašmat-*; FM *qašmat-*; Ol *qášmat-*; Oz *qašmat-*; Z *qašmat-*; C *qašmat-*; Co *qašmát-*; P *qašmat-*.

(T101) *qaštax 'lime (calcium hydroxide)' | T *qáyštah*; H *qešta:*; M *qáštał*; U *ʔeštáx*; A *qaštax*; Ol *qášta*; Z *qaštah*; P *qašta*.

(T102) *quˈnqš- 'braid' | T *ʔo:qɬ-*; H *ʔoqɬ-*; U *ʔoˈnʔš-*; A *qoˈnqš-*; FM *aqonqš-*; Ol *qunqš-*; C *qunqš-*; Co *qonqš-*; P *qoˈnqš-* (cf. *qut-).

(T103) *quˈt- 'drink, swallow' | T *ʔot-* 'drink'; Pf *haʔotnun* 'drink'; H *qot-* 'drink'; M *quˈt-* 'swallow'; U *ʔoˈt-* 'drink alcohol'; A *qoˈtnu:n* 'drink water'; Pn *qot-* 'drink'; FM *qo:t-*; Ol *qut-*; Oz *qotnan*; Z *qoˈt-* 'drink alcohol'; C *qut-* 'swallow'; Co *qoˈt-*; P *qoˈt-* 'drink, be a drinker'.

(T104) *(S)quˈtá 'knead' | U *laˈʔɬˈótá*, *laˈʔšˈóˈtá*; A *šqoˈtáˈ*; P *šqoˈtáˈ*.

(T105) *saˈqáqa 'white' | A *saˈqaqa*; FM *saqáqa*; Ol *saqáqa*; C *saq*, *saqáqa* 'white (like paper)'; P *saqaqa*.

(T106) *siːˈmaˈqáːˈt 'tongue' | T *simáʔa:ti*; Pf *simaʔat*; H *si:maqat*; M *si:maqa:ˈt*; U *si:maˈʔáːˈ*; A *si:ˈmaˈqa:ˈt*; FM *si:máqati*; Ol *semáqat*; Z *siːˈmaˈqa:ˈt*; Co *siːˈmáqa:ˈt*; P *siːˈmáqa:ˈt*.

(T107) *síːˈqnaˈ 'chicozapote (?)' (→ later PTn 'banana, plantain') | M *či:q*; U *séːˈʔnaˈ*; A *seːˈqnaˈ*; FM *se:qna*; Ol *sí:qnaʔ*; Z *seːˈqnaˈ*; C *si:qna*; P *se:qna*.

(T108) *ská:ta 'louse' | T *skáta*; Pf *skata*; H *ská:taˈ*; M *ska:t*; U *ská:ta*; A *ska:ta*; FM *ska:tiˈ*; Pn *skata*; Ol *ska:ta*; Oz *ska:t*; Z *ska:ta*; C *ská:ti*; P *ska:ta*.

(T109) *skaw 'rabbit' | Pf *skaw*; H *skaw*; U *skaw*; A *skaw*; Z *skaw* 'cord, thread'; C *skaw*; P *skaw*.

(T110) *skúnkaˈ 'having the odor of fish or metal' | U *skúnkaˈ*; Ol *skunk-*; Z *skúnka*; P *skúnka*.

(T111) *snapápa 'white' (= *s- 'diminutive' + *napápa 'white') | T *snapapa*; H *šnapap*; M *snapáp*; U *snaˈpáˈp* 'pale but shiny', *naˈpáˈpaˈ* 'pale, white, pasty'; FM *snapápa*; Ol *snapápa*; Z *snapapa*; C *snapápa*; Co *snapápa*; P *snapapa*.

(T112) *spiˈt- ‘roll, spin; return’ | T *tasp’ít-* ‘return’; H *tasp’it-* ‘return’, *ma:tasp’it-* ‘turn something over’; U *-spiˈt* ‘turn, twist’, *taspíˈt-* ‘return’; A *taspiˈt-* ‘return’, *tapa:spiˈt-* ‘roll, spin’; FM *ma:spit-* ‘turn something over’, *tapa:spit-* ‘turn belly up’; Ol *taspít-* ‘go back’; Z *taspiˈt-* ‘return’, *spiˈt-* ‘go back’; C *spit-* ‘return’; Co *pu:spiˈt-* ‘return something’; P *taspiˈt-* ‘return’, *ta:qpu:spiˈt-* ‘roll’.

(T113) *sqatán ‘plum’ | T *sqátan*; H *sqatan*; U *s’atán*; A *sqatan*; Ol *sqat*; Co *sqatán*; P *sqatan*.

(T114) *squlíˈ ‘suck, use mouth to make something whistle’ | T *sqoli*; U *s’olí* ‘make something whistle; play a wind instrument’; FM *sqoli* ‘whistle; play a wind instrument’; Ol *sqúli*; Co *sqoli* ‘whistle’.

(T115) *staːˈ ‘sell’ | T *st’a:*; H *st’a:*; M *sta:ˈ*; U *sta:*; A *sta:ˈ*; FM *sta:ˈ*; Ol *sta:*; Z *sta:ˈ*; C *sta:*; Co *sta:ˈ*; P *sta:ˈ*.

(T116) *staˈx- ‘drip$_V$, get wet’ | T *št’ah* ‘slow, repeated drops’ [ideophone]; H *št’ah-* ‘melt, liquify; drain, leak, spill; overflow; drip’; M *staˈh-* ‘get wet’; U *staˈx-*; A *staˈx-* ‘run’ (liquid); drain off ’; FM *stax-* ‘get wet’; Ol *stah-*; Z *staˈh-* ‘drip, run (liquid), get wet’; Co *staˈh-* ‘get wet’; P *staˈx-* ‘spill, drip, run (liquid), leaks’.

(T117) *stak- ‘grow’ | T *staknán* ‘rest’, *łi:sták-* ‘take care of ’; U *staˈk-*; A *stak-*; FM *stak-*; Ol *stak-*; Z *stak-*; C *stak-*; Co *stak-*; P *stak-*.

(T118) *stápu ‘bean’ | T *stápu*; H *stapu*; M *stápu*; U *stapún*; A *stapun*; FM *stápu*; Ol *stápu*; Z *stapu*; C *stápu*; P *stapu*. [Note: The final /n/ in some of the reflexes is probably a reanalyzed plural suffix.]

(T119) *stánkuˈ ‘younger sibling’ (= *s- ‘diminutive’ + *tánkuˈ) | U *stánkuˈ* ‘younger sibling’; A *stanku* ‘younger sibling’; FM *stánku*.

(T120) *suːˈnú ‘blow, blow on’ | T *su:nu*; H *su:nu:*; M *sunú’?*; U *suˈnú*; A *suˈnú*; FM *sunu* ‘blow into’; Ol *sunú* ‘blow on something’; Z *suˈnu*; C *sunu*; Co *sunú*; P *suˈnú*.

(T121) *súˈkuˈ ‘perforated’ | U *suˈkúˈkuˈ* ‘perforated, full of holes’; A *suˈku:ˈ*; Ol *súkuk* ‘hollow’; P *sukíˈ:*, *sukˈukˈu* ‘pierced, pin-pricked; hollow’.

(T122) *swiˈt- ‘tie together, tangle, wrap’ | U *swiˈt-* ‘wind (string, rope)’; A *swiˈt-* ‘tangle’; Z *swiˈt-* ‘wrap, tangle, tie together’; Co *swit-* ‘wrap’; P *swit-* ‘wrap, tangle’ (cf. **wi:t*).

(T123) *ši:ł ‘mange, scabies’ | U *ši:ł* ‘disease causing itchy white patches on skin’; A *ši:ł*; Z *ši:ł*; P *ši:ł*.

(T124) *šíːpa ‘Hog Plum’ | U *šíːpaˈ*; A *ši:pa*; Ol *šíːpa*; P *ši:pa*.

(T125) *šiˈn ‘itch$_V$’ | U *šiˈnkí* ‘scratch oneself (animal)’; FM *šin* ‘itch’; Ol *šin* ‘itch’; Z *šiˈn*; P *šiˈn*.

(T126) *šil ‘snot’ | T *šił*; H *šił*; M *qi:nšilít* (*qi:n-* ‘nose’); U *šiˈlít*, *ʔenʔašiˈlíː* ‘have a runny nose’ (*ʔenʔa-* ‘nose’); A *qanqašiliːˈt* (*qanqa-* ‘nose’); FM *qanqašili* ‘have a runny nose’.

(T127) *ška ‘bite; hurt’ | T *ška* ‘hurt’; H *ška* ‘hurt’; U *ška* ‘bite (animal); sting (insect)’; A *ška* ‘bite (animal); sting (insect)’; FM *ška* ‘bite’; Ol *ška*; Co *ška* ‘bite’; P *ška:* ‘bite (animal); sting (insect); cause an itch’.

(T128) *škáˈpaˈ ‘tick’ | U *škáˈpaˈ*; A *škaˈpaˈ*; Z *škáˈpaˈ*; P *šk’apˈaˈ*.

(T129) *škútiˈ ‘coatimundi’ | U *škúˈtiˈ*; A *škuti*; Ol *škut*; Z *škut*; C *škúti*; P *škutí*.

(T130) *šlaˈ ‘he, she, it’ (= *iš ‘3po’ + *laˈ [pronominal stem]) | U *šla*; A *šláˈ*; Ol *šla?*; Z *šlaˈ*; Co *šla*; P *šla*.

(T131) *šlámuˈ ‘dew, dewdrops’ | U *šlámuˈ*; P *šlimu*.

(T132) *šniq- ‘wilt, dry out (plant, flower)’ | U *šneˈ?-*; A *šneq-*; Ol *šnaq-*; Z *šnaq-*; Co *šneq-*; P *šnaq-* (cf. *nap- ~ *nik-).

(T133) *šqapat ‘corn ground into a powder and eaten with sugar (pinole)’ | U *š’apát*; A *šqapat*; Ol *šqápat*; Z *šqapat*; P *šqápat*.

(T134) *šqiˈqíˈn ‘type of bird’ | U *š’eˈ?éːˈn* ‘Green Jay’; A *šqeˈqeˈniˈ* ‘pájaro de primavera (bird)’.

(T135) *šquq ‘row (of plants), furrow’ | U *š’oˈ?* ‘furrow’; Ol *šquq* ‘furrow’; Z *šqoqo* ‘furrow’; P *šqoqo* ‘furrow’.

(T136) *šta'q- ~ *štiˈq- ‘woven sleeping mat’ | T *štáʔaːti*; H *št’aqati*; M *štíˈkaˈt*; U *štiˈkát*; A *šiˈkat*; Ol *štíkat*; Z *štiˈqat*; Co *štíkat*; P *štíˈkat*.

(T137) *štapú ‘dam (water), disturb’ | U *štaˈpú* ‘dam (water) to make a pool; dredge’; Z *štapu* ‘ruin, disturb’.

(T138) *štaq- ‘leave something, give’ | T *štaq-* ‘give’; H *štaq-* ‘gush, to spring, to give’, *štaqni* ‘to give’; U *šteˈ?-* ‘leave something, put something back’; FM *aqšteq-* ‘leave something behind’; Z *štaq-* ‘leave something, hand over’; C *štaq-* ‘close up’; Co *šteq-* ‘leave something, hand over’; P *štaqá* ‘leave something empty’.

(T139) *štuq- ‘gather together$_{INTR}$, meet’ | T *paːštoq-* ‘meet’, *maːlaqštóq-* ‘gather$_{TR}$’; H *lamaqayšt’oq-*, *štoq-* ‘gather together; close’; M *maːstúˈq* ‘gather$_{TR}$’; U *-štoˈ?* ‘together’, *maːtaštoˈ?óː* ‘gather$_{TR}$’, collect$_{TR}$’; A *paːštoq-* ‘meet’; FM *štoq-* ‘gather, join’; Z *štoq-* ‘be face to face’, *paːštoq-* ‘meet’; C *-štuq* ‘gather’; Co *paːštóq-* ‘meet’, *tastóq-* ‘come together’, *maːstóq-* ‘gather$_{TR}$’.

(T140) *šúːˈn ‘bitter’ | T *suːn*; H *suːn*; M *šuːˈn*; U *šúːniˈ*; A *šuˈnú*; FM *šuːn*; Ol *šon*; Z *šuːˈn*; C *šuːn*; Co *šuːˈn*; P *šuːˈn*.

(T141) *šúqiˈ ‘snail, slug’ | U *šóˈ?eˈ*; Ol *šúqa*; Z *šoqa*; P *šoqe*.

(T142) *šwáːˈtiˈ ‘metate’ | T *šwáːti*; H *šwaːt’i*; M *šwaːˈt*; U *šwáːˈtiˈ*; A *šwaːˈtiˈ*; Ol *šwáːteʔ*; Z *šwaːˈtiˈ*; P *šwaːtiˈ* (cf. *waːˈt).

(T143) *šwanq- ‘open, having a cavity’ | T *šwaː* ‘a large opening (of a mouth); U *šwanʔála*.

(T144) *ta¢a- ‘tooth’ | T *ta¢álaːti*; Pf *ta¢alat*; H *ta¢alat*; M *ta¢álaˈt*; U *ta¢án*; A *ta¢an*; FM *ta¢an*; Pn *ta¢an*; FM *ta¢an*; Ol *ta¢án*; Oz *ta¢an*; Z *ta¢an*; C *ta¢an*; Co *ta¢an*; P *ta¢án*.

(T145) *tálu 'rash, skin disease' | H *talu*; U *tálu*ˈ; A *talu*; Z *talu:y*; P *talaw*, *talu:n*.

(T146) *tama:wá 'buy' | T *lakłi:tamáw* 'market'; H *tamahu*, *łatamawnanan* 'spend'; M *í:ˈwa*ˈ; U *tama:wá:*; A *tama:wá*; FM *tama:wa*; Ol *tama:wá*; Z *tama:wa*; C *tama:wa*; Co *tama:wá*; P *tama:wá*.

(T147) *taˈnks 'straight, correct' | Ol *tanks-* 'correct'; Z *taˈnks* 'exact, correct'; C *tanks* 'lined up'; Co *taˈnks* 'level, upright, straight, correct'; P *taˈnks* 'straight, upright'.

(T148) *tantín 'defecate' (*tan- 'anus' + *tin 'excrement') | H *tanti*; U *tantín*; A *tanti:*, *tantin*; FM *stin* 'defecate' (cf. *(ʔił)tín). [Note: The PTn meronymic prefix, *tan-, is reconstructed here as 'anus', although it has additional meanings in daughter languages including 'buttocks', 'genitals', 'trunk of the body', and 'digestive system'.]

(T149) *taˈsá 'cry, yell, vocalize' | T *t'asá*; H *t'asa*; M *qiłtasá* (*qił-* 'mouth'); U *taˈsá*; A *taˈsá*; FM *tasa* 'weep'; Ol *tasá* 'weep'; Z *taˈsá* 'weep'; C *tasa* 'weep'; Co *taˈsá*; P *taˈsá:*.

(T150) *ti: 'dry up' | T *ma:ti:* 'put (clothes) out to dry'; H *ma:ti:*; M *ti*; U *pu:tí:* 'evaporate (water), go down (level of river)', *maʔapu:tí:* 'cause to dry up'; A *ti: laqapu:ti:*; FM *pu:ti* 'evaporate'; Z *pu:ti:* 'cause diarrhea, cause indigestion' (*pu:-* 'interior'); Co *qałpu:ti:* 'be thirsty' (*qał-* 'mouth').

(T151) *ti: 'what?, who?' | T *ti:sun*(*ča*) 'what?'; H *ti:č'u* 'who?'; M *tiyu:* 'who?'; U *ti:* 'who?; who, that'; A *ti:* 'who?; who, that'; Ol *ti:* 'what?, who?'; Z *ti:* 'who?'; C *ti:* 'who?; who, that'; Co *ti:* 'who?; who, that'; P *ti:* 'who, that'.

(T152) *tił- 'spread out (to dry)' | T *tikł* 'scattered'; U *tił* 'dispersed', *stił* 'spread out' (*s-* 'diminutive'), *stiłma:pí:* (*ma:pí:* 'spread something out (to dry)'); A *stiłma:pi:*ˈ 'spread something out (to dry)'; FM *ma:tiłni:* 'make someone mess something up'; Co *tił* 'crumbled, piled, in small pieces'.

(T153) *(ʔił)tiˈn 'excrement' | T *ʔiłt'i*; H *ʔiłt'i*; M *iˈłti*ˈ; U *iłtín*; A *i:ˈłtiˈn*; Ol *stin-* 'defecate'; C *stin-* 'defecate' (cf. *tantín).

(T154) *tiˈn 'seed' | T *t'in*; H *t'in*; A *tiˈni*ˈ.

(T155) *tip- 'shoot arrow' | H *pa:tip-*; U *tiˈp-*, *pu:tíˈpni*ˈ 'arrow'; A *tip-*, *li:tipni*ˈ 'arrow'; Z *pu:tipni*ˈ 'arrow', *li:tipni*ˈ 'arrow'; C *tip-*; Co *tipní:n* 'shoot arrows', *pu:tipni* 'bow'; P *tip-*, *li:tipni* 'goad, harpoon, arrow, dart'. [Note: Cf. also possibly T *tiwkʔi* (< tipʔ) 'smash against'.]

(T156) *(S)tiːˈt- 'tear, split, rip' | H *łt'it* 'sound of a seam ripping on a piece of clothing'; M *łtiːˈt-* 'tear'; U *štiˈt-* 'tear, rip', *štiːˈtštiːˈt* 'paper tear-

ing', *sti'sti't* 'corn being husked, cloth being torn', *łti:'ƛti:'t* 'splitting apart'; A *šti:'t-* 'tear (cloth, paper)'; FM *šti:t-* 'tear something'; Ol *štet-*; Z *šti:'t-* 'tear, shred'; C *šti:t* 'tearing, shredding'; Co *šti:t-* 'tear'; P *šti:'t-* 'tear up, shred'.

(T157) *(S)tiwí 'rock$_{TR}$, swing$_{TR}$' | H *łt'iw* 'action of swinging or rocking'; U *stiwí*; Z *stiwi'*; P *stiwí*.

(T158) *tu'k(S)- 'snap off, break off' | H *tuks paks* 'sound of something small snapping'; U *tu'kš-*; A *tu'kš-*; FM *tukš-*; Ol *tukš-* 'break'; Z *tukš-*; Co *tu'kš-*; P *tu'kš-*.

(T159) *tum 'one' | H *tam*; Pf *tam*; T *tawn*; U *tin*; A *tin*; Pn *tin*; FM *tim*; Ol *tum*; Oz *tum*; Z *tum*; C *tum*; Co *tum*; P *tum*.

(T160) *(S)tu'nq- 'spread$_{TR}$, stretch$_{TR}$, extend$_{TR}$' | U *sto:'nʔ-* 'straighten out'; A *što:'nq-* 'stretch$_{TR}$'; FM *štonq-* 'stretch$_{TR}$'; Ol *stunq-* 'stretch$_{TR}$'; Z *sto'nq-* 'spread$_{TR}$', *što'nq-* 'stretch$_{TR}$'; Co *što'nq-* 'stretch$_{TR}$', *sto'nq-* 'stretch$_{TR}$'; P *što'nq-* 'stretch$_{TR}$', *sto'nq-* 'straight, stretched out, extended'.

(T161) *tú'qu' 'old woman' | T *t'aku* 'female (used mostly for animals)'; Pf *t'aku* 'woman'; M *tá'ku* 'woman'; U *tóʔo'*; A *to'qo*; C *tuqu*; P *to'qo'* 'mole (on skin)'.

(T162) *tuq(S)- 'touch, feel, strike' | M *taq-*, *tuq-* 'knock (on door)'; U *to'ʔɬ-*; Ol *tuqɬ-* 'touch$_{TR}$'; Z *toqɬ-*; Co *toqɬ-* 'hinder; squeeze'; P *toqɬ-*, *tukɬ-*.

(T163) *tuqú 'jab, prick, poke' | T *štoqo* 'pierce, stab'; H *toqo*; U *što'ʔó* 'jab; inject; nail'; A *štoqó* 'nail'; FM *štoqo* 'inject; jab'; Ol *štuqú* 'nail$_{TR}$'; Z *štoqo* 'string together, nail'; Co *štoqó* 'nail'; P *štoqó* 'nail, string together like a necklace, sew'.

(T164) *¢aká:t 'rubber, elastic' | H *li¢akat* 'chewing gum'; U *¢a'ká:t* 'Gumtree; rubber, slingshot'; A *¢aka:t*; Ol *¢áka:t*; Z *¢aka:t*; P *¢a'ka:'t* 'chewing gum'.

(T165) *¢a'qá' 'bite, chew' | T *¢'ak'a* 'bite'; H *¢'ak'a* 'bite, chew, sting'; M ¢a'qá'; U *la'ʔa'ʔá, ¢a'ʔanán* 'chew gum'; A *¢a'qá'*; FM *¢aqa* 'chew something'; Ol *¢aqá*; Z *¢a'qa'*; C *¢aqa-*; Co *¢a'qá'*; P *¢a'qá'*.

(T166) *¢a'tá'ta' 'soft' | M *¢a'tá't*; U *¢a'tá'ta'*, *¢a'tá'x*, *ła'tá'ta'* 'soft, springy'; A *¢a'ta'ta'*; Ol *¢atáta?*; Z *¢a'ta'ta'*; C *¢atata*; Co *¢a'tá'ta'*, *¢a'ta'tá'n* 'soften'; P *¢a'ta'ta'*.

(T167) *¢áwa' 'amaranth' | T *¢aw*; H *¢aw*; U *¢áwa:'*; A *¢awa'*; P *¢awa* 'red amaranth' (cf. *ká'ka).

(T168) *¢i' 'black' | T *¢'íti*; M *¢i't*; U *pu'¢é'nʔs*, *pu'¢é'nʔe'*; A *¢i'¢e'qe*; Ol *¢i¢áqa*; Z *¢i'¢i:'qe* 'black, mole (on skin)'; Co *¢i'¢é'qe*; P *¢'i¢'eqe* 'black, dark'.

(T169) *¢i:' 'mother' | T *¢iʔi* 'girl'; U *¢i:'*; A *¢i:'t*; Ol *¢eʔ*; Z *¢i'*; C *¢i*; Co *¢i'*; P *¢i'*, *¢e'*.

(T170) *¢íˈ¢i ‘infection, sore, canker’ | T *¢’iɬ’i* ‘canker’; H *¢’iɬ’i* ‘zit, bump’; U *¢íˈ¢i* ‘wound, scrape, swelling, insect bite’; A *¢iˈ¢i*; Ol *¢íɬe?*; Z *¢iˈ¢i*; Co *¢íˈ¢i*; P *¢iˈ¢i* ‘zit, infection, rash’.

(T171) *¢iˈkíː ‘suckle’ | T *¢’ik’í*; H *¢’ik’i*; M *¢iˈkiːˈnán*; U *¢iˈkíː*, *¢iˈkí* ‘milk; breast’; A *¢iˈkiː* ‘milk, breast’; FM *¢ikiːˈ*; Ol *¢iké*; Z *¢iˈkiːˈ* ‘mother; breast; mother’s milk’; C *¢ikiː*; Co *¢iˈkiːˈ*; P *¢iˈkíˈ*.

(T172) *¢uːˈk- ‘kiss’ | FM *¢uːk-*; Ol *¢ok-*; Z *¢uːˈka*; C *¢uːk-*; Co *¢uːˈk-*.

(T173) *¢uˈɬú ‘suck’ | T *č’uč’ú*; H *paːč’uč’u* ‘suck through a straw; lick off of the finger’; M *čuˈčú* ‘suck’, *¢uˈɬú* ‘smoke (cigarettes)’; U *¢uˈɬú*; A *¢uˈɬúˈ*; FM *¢uɬu*; Ol *¢uɬú*; Z *¢uˈɬuˈ*; P *¢uˈɬúˈ*. [Note: The /č/ ~ /¢/ alternations in the reflexes of this root probably have their origins in sound-symbolism, raising the possibility of also reconstructing *čuˈčúˈ.]

(T174) *¢ukú ‘begin’ | T *¢uku*; H *¢uku* ‘begin; live’; M *¢ukú*; U *¢ukú*; A *¢ukú*; FM *¢uku*; Ol *¢ukú*; Z *¢uku*; C *¢uku-*; Co *¢ukú*; P *¢ukú*.

(T175) *¢uˈq- ‘write, draw, paint’ | T *¢’oq-*; H *¢’oq-*; U *¢oˈʔ-*; A *¢oˈq-*; FM *¢oq-*; Ol *¢oq-*; Z *¢oˈq-*; C *¢uq-*; Co *¢oˈq-*; P *¢oˈq-*.

(T176) *¢uqus- ‘knee’ | T *¢oqoq-*; Pf *¢oʔotni*; H *¢oqot*; M *¢uqúsniˈ*; U *¢oˈʔósniˈ*, *¢oˈʔos-*; A *¢oqosniˈ*; Pn *¢uqusniˈ*; FM *¢oːqosni*; Ol *¢uqúsneʔ*; Oz *¢uqusniˈ*; Z *¢oqosniˈ*; C *¢uqusni*; Co *laq¢oqósni*; P *¢oqosni*, *¢oqos-*.

(T177) *uyúːl ‘jug’ | T *úyul* ‘jug’; P *úyuːɬ* ‘the pot or jug used to hold fresh water’. [Note: Huastec (Mayan) *xuyuːl* ‘jug’, a probable loan from a Tn language.]

(T178) *waːq ‘scratch, dig’ | A *waːqnaˈn* ‘dig in the ground’; P *waːq-*, *weːq-* ‘scratch’.

(T179) *waːˈt ‘tamale’ | H *šqapawaːt* ‘bread’; U *waːˈ*; A *waːˈt*; Ol *wat*; Z *waːˈt*; C *waːti*; P *waːti* (cf. *wáːˈtiˈ).

(T180) *(S)wak- ‘plane$_V$’ | T *ɬwaq* ‘divide, split’; H *ɬwak ɬwak* ‘sound of rapid cutting with a saw’, *slewak slewak* ‘cutting something into strips with a machete’; U *šwak-*; FM *šwak-*; Z *šwak-*; P *šwak-*.

(T181) *waˈká ‘be high’ | T *huk’aɬ*, *tawk’a* ‘go up high’; U *wakáɬ*; A *waˈká*; FM *waka*; Ol *wáka*; Z *waˈkaˈh*; Co *wak’a*; P *wakaˈ*.

(T182) *wan ‘say’ | T *hun*; H *hun*; M *wan*; U *wan*; A *wan*; FM *wan*; Ol *wan*; Z *wan*; C *wan*; Co *wan*; P *wan*.

(T183) *waš- ‘scratch’ | FM *waš-*; Z *waš-*; C *waš-*; Co *waš-*; P *waš-*.

(T184) *(S)waˈtá ‘saw’ | T *šut’a*; H *ɬwat’at’a* ‘action and sound of rapid sawing’; U *šwaˈtá*; A *šwaˈtá*.

(T185) *(S)wiq ‘[repetitious noise]’ | T *šweq* ‘screeching’; H *weq weq* ‘rib-biting’; U *šweˈʔén* ‘wooden noisemaker’.

(T186) *wiš ‘you$_{SG}$’ | T *ušínt’i*; H *ʔušint’i*; M *wiˈš*; U *wiˈš*; A *wiˈš*; Pn *wiš*; FM *wiš*; Ol *wiš*; Oz *wiš*; Z *wiˈš*; C *wiš*; Co *wiš*; P *wiš*.

(T187) *xá:kaˈ ‘Marmalade Fruit’ | T *ha:ka* ‘banana’; H *ha:k* ‘banana’; M *ha:k*; U *xá:kaˈ*; A *xa:ka*; Z *ha:ka*; C *xa:ki*; P *xa:ka*.

(T188) *xin ‘smoke$_V$’ | T *hin*; H *hin*; M *hiˈn* ‘smoke$_N$’; U *xin*; A *xin*; Ol *xíne?*; Oz *xin*; Z *hin*; C *xini* ‘thick smoke’; Co *hin*; P *xin*.

(T189) *xú:kiˈ ‘deer’ | T *hú:ki* ‘beast of burden’; H *hu:k*; M *hú:kiˈ*; U *xu:kiˈ*; A *xu:kiˈ*; FM *xu:kiˈ*; Ol *xú:ke?*; C *xu:ki*; Z *hu:kiˈ*; P *xu:kiˈ*.

(T190) *xun ‘hummingbird’ | T *hun*; Pf *fun*; H *hun*; U *xu:n*; A *xun*; FM *xuniˈ*; Ol *hun*; Z *hun*; C *xun*; P *xun*.

6. Cognate sets and words reconstructed for PTz. The 188 cognate sets provided as evidence for the genetic affiliation of PTn and PMZ are presented below. Each set, preceded by an identification number, is headed by a word reconstructed for PTz based on proposed sound correspondences and on the hypothesized phonological inventory for PTz. This is immediately followed by the divider “|” and then by the PTz word’s reflex in PTn, which consists of a reconstructed PTn word and its proposed meaning. (Cognate sets supporting PTn reconstructions are given in **5.3**.) Next presented is a reconstructed form for a MZ proto-language extracted from Wichmann (1995). In most instances, the reconstructed word is for PMZ, but, barring the availability of the latter, the word is a reconstruction for PM, POM, PZ, or PGZ. The meanings associated with reconstructed MZ words are those assigned by Wichmann (1995).

When a reconstruction for PM, POM, PZ, or PGZ, but not for PMZ, is found in Wichmann (1995) and employed in a cognate set, we also provide a PMZ reconstruction for the set, given in brackets following Wichmann’s reconstruction. This PMZ reconstruction is the form that conforms best, in terms of sound correspondences, to both the reconstruction from Wichmann (for PM, POM, PZ, or PGZ) and the PTz word.[23]

We indicate for PTn and PMZ corresponding reconstructions those parts of respective forms that are extraneous to derivation from a pertinent PTz root by grouping those segment in braces ({. . .}). In general we make no attempt to account for these “residues”; however, some common patterns are observed. One of these is the frequent case (24 forms) where a reconstructed PTz verb stem and its PMZ reflex lack a final vowel but the PTn reconstruction has a stressed final vowel. Many modern Tn languages show traces of an earlier PTn system of verbal derivation involving a vowel-harmonic suffix

[23] When a word from PM, POM, PZ, or PGZ is cognate with a word from PTn, that necessarily means that the cognate words are reflexes of a PTz form and, consequently, that there was a reflex of the latter in PMZ even if distributions of reflexes across contemporary MZ languages on their own do not attest to a PMZ form (and, thus, is not reconstructible for Wichmann [1995]).

-V or -V: acting as either a verbalizer or a transitivizer, this suffix bearing the word-level accent.[24] Also found are three reconstructed PTz forms (*məhʔkʸ, *pak, and *təhɬ) which correspond to prefixal body-part terms in PTn (*mak{a-} 'hand', *paq{a-} 'arm, wing, branch', *taɬ{a-} 'tooth'), where a final vowel seems to have been added. The segment *-a-* is attested as a connective element in compounds in at least some Tn languages, suggesting the extraneous *a* in the PTn forms may have come about as the result of the compounding of body-part terms with verb stems. Various other PTn forms show residues that resemble nominalizers in modern Tn languages; however, investigation of specific cases remains for future research.

For some cognate sets, notes are given in brackets. Notes provide additional information bearing on some feature or features of cognate sets. Semantic information may be presented that contributes to understanding meaning equations. Information relating to phonological changes may be given that is not covered in the text. When a PTn or PMZ reflex of a PTz word is unexpected phonologically, the expected reflex is noted. Miscellaneous other issues are dealt with as bracketed notes as well.

Some PTz forms are reconstructed with stem-initial H. These are isomorphic with PTn words also reconstructed with stem-initial H (**5.3**). In PTn reconstructions, H indicates that the segment could be either *h* or *x*, and is thus ambiguous because of evidence missing from Totonacan languages (see **5.2.2**, n. 16). H in PTz reconstructions flags the same ambiguity.

Totozoquean Cognate Sets

(Tz1) *akə | PTn *aqa- 'ear, the part of something that sticks out' [meronymic prefix]; PMZ *ʔak(ə) 'bark, skin'.[25] [Note: POM *ta:ɬk ʔak 'exterior part of ear'.]

(Tz2) *čA | PTn *čá:ˈ{mu:n} 'tumpline' (derived from PTn *čaˈx 'rope' + *mu:n 'forehead'); PMZ *ɬa{y} 'fiber rope'.

(Tz3) *čA:č | PTn *čá:ˈk{ał} 'type of fly'; PM *ɬaɬi 'fly$_N$' [PMZ *ɬa:ɬ{i}]. [Note: PM *ɬa:ɬi is expected.]

(Tz4) *ča:m | PTn *ča: 'ripen'; PMZ ɬa:mʔ 'ripen'.

(Tz5) *čahʔ | PTn *ča{xí:t} 'hail'; PMZ *ɬa:ʔ 'stone'.

(Tz6) *čE: | PTn *či:ˈ 'tie, tie up'; PGZ *ɬen 'tie' [PMZ *ɬe{n}].

(Tz7) *čEq ~ *čAq | PTn *čaˈq{á:ˈ} 'wash'; PZ *ɬeʔ 'wash' [PMZ *ɬeʔ].

(Tz8) *čEʔt | PTn *čiˈt- 'wring out, grind'; POM *ɬeʔt ~ *ɬeʔet 'squash, crush' [PMZ *ɬeʔt].

[24] Another possibility is that some or all of these final vowels were present in PTz and conserved in PTn, but lost in PMZ. Our PTz reconstructions contain relatively few stems of the form (X)CV.

[25] It is assumed that MZ roots beginning with a vowel automatically take a stem-initial glottal stop (#ʔ-) creating words conforming to CVC, the MZ canon.

(Tz9) *či:n | PTn *čí:n{aˈ} ‘pus’; PMZ *¢i:n{u} ‘honey’.

(Tz10) *čih | PTn *či{qí} ‘tear, break’; PZ *¢ih ‘break’ [PMZ *¢ih].

(Tz11) *čuh | PTn *čuh- ‘spit’ [PMZ *¢uh ‘spit’]. [Note: PTn *ču- is expected.]

(Tz12) *čuku | PTn *{(aˈq)}čuqú ‘move around; take a walk’ (aˈq- ‘head’); PM *¢ukut ‘move (arm, leg)’ [PMZ *¢uku{t}]. [Note: SaP *¢ugut* ‘move’.]

(Tz13) *čƏ ~ *čɬ | PTn *čiˈ{pá} ~ *čaˈ{pá} ‘grab, grasp’; PZ *¢ək ‘grasp’ [PMZ *¢ə{k}].

(Tz14) *hi:q | PTn *hi:qi ‘yes’; PMZ *hə:ʔ ‘yes’.

(TZ15) *Hakʸ | PTn *Hak ‘acrid or rotten smell’; PZ *hak(a) ‘bad smelling’ [PMZ *hak].

(Tz16) *Haʔ | PTn *Ha{láˈ} ‘grind (corn)’; PZ *haʔp ‘grind’ [PMZ *haʔ{p}]. [Note: TxZ *ha:ʔp* ‘grind on a metate’.]

(Tz17) *Haʔl ~ *Huʔl | PTn *Hal{áˈn} ‘embers’; PMZ *huʔy{i} ‘coal’.

(Tz18) *Hikʸʔ ~ *Hukʸʔ | PTn *Hik- ‘fire’; PMZ *huk ʔ ‘to smoke’.

(Tz19) *Hiʔkʸs | PTn *Hiks{wáˈ} ‘drown’; PM *hiʔkš ‘drown’ [PMZ *hiʔks].

(Tz20) *kʸA:h | PTn *ka:ˈ- ‘place of’ [locative prefix]; POM *kahpVn ‘village, town’ [PMZ *kah + *pən, literally, ‘place’ + ‘people’].

(Tz21) *kʸa | PTn *ka{x} ‘sour, bitter’; PMZ *ka{¢u(¢)} ‘sour, bitter’.

(Tz22) *kʸI:ʔ | PTn *-kiːˈ ‘lift’; PZ *kiʔm ‘ascend’ [PMZ *kiʔ{m}].

(Tz23) *kʸin | PTn *kin- ‘nose’; PZ *kinə ‘nose, point, peak’ [PMZ *kin{ə}].

(Tz24) *kʸIs (cf. *kʸuši') | PTn *kíˈs{paˈ} ‘corn (kernels)’; PMZ *{ʔə}ks{-i} ‘corn nibs [kernels] (dry)’. [Note: The PMZ form could occur in either of two cognate sets, meaning that only one of the two sets is valid.]

(Tz25) *kʸə:š | PTn *ka:š ‘fixed, prepared’; PM kəš ‘to finish’ [PMZ *kə:s]. [Note: PM *kə:hš is expected.]

(Tz26) *kʸən | PTn *kan- ‘savory, delicious’; PGZ *kə:n ‘savory’ [PMZ *kən]. [Note: Long vowel is a secondary development in GZ languages.]

(Tz27) *kʸɬCI | PTn *kíˈwiˈ ‘tree, wood, firewood, stick’; PMZ *kəpi ‘tree, firewood’. [Note: C in the PTz reconstruction stands for some bilabial segment.]

(Tz28) *kʸihʔt | PTn *kit{í} ‘grind on metate’; PMZ *kə:ʔt ‘grind pinole’.

(Tz29) *kʸušI (cf. *kʸiˈs) | PTn *kúši' ‘corn (maize), corn kernels’; PMZ *{ʔə}ks-i ‘corn nibs (dry)’. [Note: The PMZ form could occur in either of two cognate sets, meaning that only one of the two sets is valid.]

(Tz30) *kʸwAhkʸw | PTn *káˈk{a} ‘amaranth, edible greens’; PM wa:w ‘edible piper’ [PMZ *wa:w].

(Tz31) *k^{y}weh?ɬ | PTn *kiɬ- ‘mouth’; POM *we:?y ‘to lick’ [PMZ *we:?y].

(Tz32) *k^{y}wi: | PTn *ki:- ‘go and return’ [verbal prefix]; PZ *witu? ‘to return’ [PMZ *wi{tu?}].

(Tz33) *kA: | PTn *qá:ˈ{ti:} ‘plant with hollow stem’; PMZ *ka{pe} ‘type of bamboo’.

(Tz34) *kA:t | PTn *{si:ˈma'}qá:ˈt ‘tongue’; PZ *kat ‘lick’ [PMZ *ka:t].

(Tz35) *kA | PTn *{¢a'}qá' ‘bite; chew’; PM *kay ‘eat tortillas’ [PMZ *ka{y}].

(Tz36) *kaš | PTn *qáš{tah} ‘lime (calcium hydroxide)’; PM *{?a}kaš ‘lime (calcium hydroxide)’ [PMZ *?akas].

(Tz37) *kE:h | PTn *-qi:' ‘opened (bottle, pot), uncovered’; PM *keh ‘untie’ [PMZ *keh].

(Tz38) *ke?nkš ~ *kO?nkš or *kU?nkš | PTn *quˈnqš- ‘braid$_{V}$’; PM *ke?kš ‘braid$_{V}$’ [PMZ *ke?ks].

(Tz39) *kos | PTn *{¢u}qus- ‘knee’; PMZ *kos{o(k)} ‘knee’.

(Tz40) *kU?t | PTn *quˈt- ‘drink, swallow’; PZ *ku?t ‘eat something soft’ [PMZ *ku?t].

(Tz41) *kɔš | PTn *qaˈš{í} ‘strike with hand’; PMZ *kos ‘hit with fist’.

(Tz42) *lo:?k | PTn *lú:qˈ{u'} ~ *lú:ˈq{u'} ‘throat, swallow$_{V}$, egret or heron (long-necked bird)’; PMZ *yo?k{(-tu)} ‘neck’. [Note: PMZ *yo:?k(-tu) would be expected given the PTz form; NHM *yo?kt* ‘neck, throat, scruff of the neck’.]

(Tz43) *lə? | PTn *{š}laˈ ‘he, she, it’ (= *išə- ‘3po’ + *laˈ [pronominal stem]); PMZ *yə? ‘(demonstrative pronoun) this’. [Note: SJ *yə?ə* ‘he, she, it, him, her–specific’.]

(Tz44) *li?k^{y} | PTn *lik{š}- ‘to shake, vibrate’; PZ *yə?k ‘shake’ [PMZ *yə?k].

(Tz45) *n^{y}ema | PTn *lamá ‘flame$_{V}$, burn’; PZ *nema ‘flame’ [PMZ *nema].

(Tz46) *n^{y}U?š | PTn *lúˈš{u'} ‘cloth, clothes’; PMZ *nu?s ‘to cover’. [Note: PZ *nu?s-kuy ‘blanket, jacket, sarape’.]

(Tz47) *ɬk^{y}ə:? | PTn *ɬka: ‘measure$_{V}$’; PMZ *kə? ‘hand, arm’. [Note: TxZ *kə?* ‘. . . hand (measure of five)’.]

(Tz48) *ɬku?t | PTn *ɬqut- ‘braid$_{V}$’; POM *ku?t ~ *ku?ut ‘braid$_{V}$’ [PMZ *ku?t].

(Tz49) *ɬtɔl | PTn *ɬtaˈl{á} ‘red hot, burning’; PMZ *toy ‘to burn, to hurt’.

(Tz50) *ƛah?nk^{y} ~ *ƛeh?nk^{y} | PTn *ƛank- ‘big, more’; PMZ *ye:?k ‘to grow’.

(Tz51) *ƛɔx | PTn *ƛax ‘earn, win’; PMZ *yoh ‘owe, pay’. [Note: PTn *ƛa is expected.]

(Tz52) *mA:hʔ | PTn *ma:ˈ ‘be lying down’; PMZ *ma:hʔ ‘sleep$_V$’.
(Tz53) *ma:ʔ | PTn *{ta}ma:{wá} ‘buy’; PMZ *maʔ{ay} ‘sell’.
(Tz54) *mah | PTn *ma{qá:n} ‘old, ancient’; PM *mah-Vt ‘old (living being)’ [PMZ *mah]. [Note: POM *mah haʔy ‘old (man, animal)’.]
(Tz55) *mat | PTn *{qaš}mát- ‘hear’; PMZ *mat{ow} ‘hear’.
(Tz56) *ma¢ | PTn *ma¢{át} ‘salt’; PM *ta:ma¢ ‘salty’ [PMZ *{ta:}ma¢].
(Tz57) *min | PTn *min ‘come’; PMZ *min ‘come’.
(Tz58) *mis ~ *mus | PTn *mis{pá:} ‘to know’; PZ *mus ‘know’ [PMZ *mus].
(Tz59) *mUh (cf. *muˈʔ) | PTn *muˈ{nú:} ‘make wet’; PMZ *muh ‘to soak’.
(Tz60) *mUʔ (cf. *muˈh) | PTn *múˈ{sniˈ} ‘spring (water)’; PMZ *muʔ{t} ‘spring (water)’.
(Tz61) *məhʔk^y | PTn *mak{a-} ‘hand’; PMZ *məːʔk{s} ‘wring out’. [Note: PM *məːʔkš-i(k) ‘fist’, and TxZ *bəʔks* ‘squeeze (with the hand)’.]
(Tz62) *məƛ | PTn *maˈƛ- ‘bamboo’; PM *məhy ‘long grass’ [PMZ *məy].
(Tz63) *mən | PTn *maˈn{táh} ‘sweet potato’; PMZ *mən{(i)} ‘sweet potato’.
(Tz64) *mənkʔ ~ *monkʔ or *munkʔ | PTn *munq{á:} ‘covered in dew’; PMZ *məkʔ ‘dew’.
(Tz65) *mwA | PTn *{lú}waˈ ‘much, many’; PMZ *ma{y} ‘much’.
(Tz66) *mwə: | PTn *waːˈ{t} ‘tamale’; PM *məʔk-i ‘tamale’ [PMZ *mə{ʔk}].
(Tz67) *mwiš | PTn *wiš ‘you $_{SG}$’; POM *miš ‘(pronoun) you (masculine vocative), boy (vocative)’ [PMZ *mis].
(Tz68) *nak | PTn *naq- ~ *nik- ‘beat, hit’; PMZ *nak{s} ‘to whip, beat’.
(Tz69) *ni: | PTn *ni: ‘negation’; PMZ *ni ti ‘(particle) nothing’. [Note: PM *ni ‘(particle) negation’.]
(Tz70) *nk^{y}wapah | PTn *nápa ‘aunt’; PZ *ʔapah ‘mother’ [PMZ *wapah]. [Note: PMZ stem-initial *w was dropped to dissimilate from -p- in the PZ reflex. In Wichmann (1995), there are no PZ forms that reconstruct *wVp. However, such forms do reconstruct for Mixean proto-languages, such as the following from Wichmann (1995): PM *wip, *wipš, *wop, and POM *wəːʔpš.]
(Tz71) *nk^{y}wip | PTn *níp{šiˈ} ‘squash’; POM *wip ‘chayote vine’ [PMZ *wip]. [Note: Chayote is a squash-like fruit.]
(Tz72) nəhnq | PTn *nanq ‘having to do with water’; PMZ *nəːʔ ‘water’.
(Tz73) *oːʔl | PTn *{uy}úːl ‘jug’; POM *ʔoːʔy ‘jug’ [PMZ *{ʔ}oːʔy].
(Tz74) *ohʔp | PTn *pupú ‘boil$_V$’. [Note: Possibly from onomatopoeic PTn *up + *up + *up]; PM *ʔoːʔp ‘to foam’ [PMZ *{ʔ}oːʔp].

(Tz75) *pa:k | PTn *pá:q{aˈ} ‘Brown Jay’; POM *pak (dove’ [PMZ *pa:k]. [Note: POM *pa:hk is expected.]

(Tz76) *pak | PTn *paq{a-} ‘arm, wing, branch’; PMZ *pak ‘bone’.

(Tz77) *pAk | PTn *paˈq- ‘break$_{TR}$’; PZ *pak ‘to hit, to knock down’ [PMZ *pak]. [Note: PZ *pak is from Kaufman (2007).]

(Tz78) *pikʸš | PTn *pikš- ‘itch$_{V}$’; PMZ *piks ‘to tap, pick at’.

(Tz79) *pIn | PTn *piˈn- ‘red’ or PTn *piˈn ‘chili pepper’; PMZ *{nəʔ}pin ‘blood’. [Note: Probably derived from PMZ *nəʔ ‘water’ + *pin ‘red’.]

(Tz80) *pInkʸw | PTn *piˈnk{š}- ‘pinch’; PMZ *piw ‘to pick up’. [Note: Cn *pi:w ~ piw* ‘pick up (with fingers, e.g., corn kernels)’.]

(Tz81) *pip ~ *pup | PTn *pip{í} ‘tremble, shake’; PZ *pup ‘shake’ [PMZ *pup].

(Tz82) *pisi: | PTn *pisí:{s} ‘Elephant Ears (plant with edible tuber)’; PMZ *pisi ‘*Manihot* spp.’. [Note: A *pisisi* ‘cassava, yucca’ (*Manihot* spp.).]

(Tz83) *po:ʔɤ̆ | PTn *pu:ɤ̆ ‘mud’; PZ *poʔyo ‘sand’ [PMZ *po:ʔy{o}]. [Note: Some reflexes mean ‘fine dirt’.]

(Tz84) *pok | PTn *puq ‘gourd’; PMZ *pok{(ok)} ‘gourd’.

(Tz85) *ponkw | PTn *punq{ú} ‘bubble, bubbly, foamy’; PZ *poh ‘to steam’ [PMZ *pow]. [Note: The PZ form is a correction of PZ *pow, a typographical error in Wichmann (1995).]

(Tz86) *pOtʸ | PTn *puˈč{a} ‘tear, break, snap (something long and thin)’; PM *poht ‘tear something long and thin’ [PMZ *pot]. [Note: PM form is revised by Wichmann for this paper (cf. Wichmann 1995:436).]

(Tz87) *pu:š | PTn *pu:š{ú:} ‘drizzle$_{V}$’; POM *pu:šypy ‘vapor’ [PMZ *pu:s]. [Note: Some reflexes mean ‘steam after a rain’.]

(Tz88) *pu:čʔ | PTn *pu:č{í:ˈ} ‘rot$_{V}$’; PMZ *pu:ȼʔ ‘rot’.

(Tz89) *pUq | PTn *puˈq{uˈ} ‘belly, stomach’; PMZ *puʔ{pu} ‘intestines’. [Note: Olp *puʔpu* ‘belly’.]

(Tz90) *pUqš | PTn *puˈqš{(niˈ)} ‘dust’; PM *puʔš{u(m)} ‘dust’ [PMZ *puʔs{u(m)}].

(Tz91) *pUš | PTn *puˈš{ám} ‘twenty’; PMZ *{ʔi:ʔ}ps ‘twenty’.

(Tz92) *pUš | PTn *puˈš ‘pick (fruit), tear off ’; PM *puhš ‘cut with a machete’ [PMZ *pus]. [Note: PM form is revised by Wichmann for this paper (cf. Wichmann 1995:429).]

(Tz93) *pUʔkʸ | PTn *púˈk- ‘smell rotten, stink’; PMZ *puʔk{s} ‘to gain color, to ripen’. [Note: AyZ *puʔks* ‘rot’.]

(Tz94) *pɔ | PTn *papáˈ ‘moon, month’; PMZ *po{yʔa} ‘moon, month’.

(Tz95) *pɔhpʔɔʔ | PTn *{sna}pápa ‘white’ (= *s- ‘diminutive’ + *napápa ‘white’); PMZ *po:pʔoʔ ‘white’.

(Tz96) *pɔn ~ *pɔm | PTn *pam- ‘soft’; PZ *ponon ‘soft’ [PMZ *pon{on}].

(Tz97) *pɔq | PTn *paq ‘be born; sprout$_{V}$, flower$_{V}$’; PZ *poˀ ‘sprout$_{V}$, be born’ [PMZ *poˀ].

(Tz98) *pɔˀt | PTn *{šqa}pat ‘corn ground into a powder and eaten with sugar (pinole)’; PZ *poˀte ‘flour, corn ground into a fine powder and eaten with sugar (pinole)’ [PMZ *poˀt{e}].

(Tz99) *pən | PTn *{la:}pán ‘person’; PMZ *pən ‘man’.

(Tz100) *pənkw | PTn *panq- ‘burst, explode’; PZ *pəh ‘to burst’ [PMZ *pəw].

(Tz101) *pəš | PTn *paš- ‘bathe$_{INTR}$’; PMZ *pəs{-V(k)} ‘sweat’; PZ *pəs ‘sweat’. [Note: N *pəs* ‘sweat, put water on it’.]

(Tz102) *qOhˀt | PTn *quˈt{á} ‘knead’; PMZ *yo:ˀt ‘knead’. [Note: Possibly PTz *q → PMZ *y/#__ (no counter-evidence yet observed).]

(Tz103) *sAhka | PTn *saˈqá{qa} ‘white’; PMZ *sa:ka ‘white’. [Note: PMZ form reconstructed by Wichmann for this paper. The reconstruction is based on To *winša:hk* ‘whitened pupil of the eye due to some injury’ (*wi:hn* ‘eye’), and Cp *pokasaka* ‘egg white’ (*poka* ‘egg’).]

(Tz104) *sE:ˀkn | PTn *sí:ˈqn{aˈ} ‘chicozapote (?)’ (→ later ‘banana, plantain’); PMZ *seˀn{ke} ~ *seˀn{ki} ‘chicozapote (*Manilkara zapota*)’. [Note: Reconstruction by Wichmann for this paper. This reconstruction is based on SaP *šeˀnk* ‘chicozapote’, GU *šeˀenky* ‘chicozapote’, and Cn *šeˀñ* ‘chicozapote’. PMZ *se:ˀnke ~ *se:ˀnki is expected as a reflex of the PTz form.]

(Tz105) *skʸwoˀnkʸw | PTn *skúnk{aˈ} ‘having the odor of fish or metal’; PGZ *woˀh ‘fish’ [PMZ *woˀw].

(Tz106) *skʸɔ | PTn *ska{w} ‘rabbit’; PMZ *ko{ya} ‘rabbit’. [Note: Huastec (Mayan) *koy* ‘rabbit’, a probable loan from an MZ language.]

(Tz107) *skoˀl | PTn *squlíˈ ‘suck; use mouth to make something whistle’; PM *koˀy ‘to suck (inside the mouth)’ [PMZ *koˀy].

(Tz108) *skɔya | PTn *sqatá{n} ‘plum’; PZ *koya ‘tomato’ [PMZ *koya].

(Tz109) *spIt | PTn *spiˈt- ‘roll, spin; return’; PMZ *pit ‘roll up’. [Note: PM *wimpit ‘return’.]

(Tz110) *stAˀ | PTn *staˈ{x-} ‘drip$_{V}$, get wet’; PM *taˀkš ‘to drip’ [PMZ *taˀ{ks}].

(Tz111) *stɔ:ˀkʸ | PTn *sta:ˈ ‘sell’; PM *to:ˀk ‘to sell’ [PMZ *to:ˀk].

(Tz112) *sU | PTn *súˈ{kuˈ} ‘perforated’; PMZ *su{t} ‘to perforate’.

(Tz113) *sU:hˀ | PTn *su:ˈ{nú} ‘blow, blow on’; PMZ *su:hˀ ‘blow’.

(Tz114) *swɬhˀt | PTn *swiˈt- ‘tie together, tangle, wrap’; PM *wə:ˀt ‘to tie together (poles, cane)’ [PMZ *wə:ˀt].

(Tz115) *ši: | PTn *ši:{ɬ} ‘mange, scabies’; PM *ni:-šihk ‘mangey, having scabies’ [PMZ *si{k}]. [Note: PM form is revised by Wichmann for this paper (cf. Wichmann 1995:440).]

(Tz116) *ši:pa | PTn *šíːpa ‘Hog Plum’; PZ *sapane ‘marmalade fruit (mamey)’ [PMZ *sa:pa{ne}].

(Tz117) *ši | PTn *ši{l} ‘snot’; PZ *sit ‘snot’ [PMZ *si{t}].

(Tz118) *šIʔ | PTn *šiˈ{n} ‘itch$_V$’; PM *šiʔp ~ *ši:p ‘cause an itch’ [PMZ *si:ʔ{p}].

(Tz119) *šk^{y}Ap | PTn *škáˈp{aˈ} ‘tick’; PM *kapi(C) ‘scorpion’ [PMZ *kap{i}]. [Note: Both creatures are arachnids.]

(Tz120) *šk^{y}uʔy | PTn *škút{iˈ} ‘coatimundi’; POM *kuʔuy ‘large, red squirrel’ [PMZ *kuʔy]. [Note: Coatmundis and squirrels have a superficial resemblance, including long, furry, looping tails.]

(Tz121) *sk^{y}wa:t | PTn *ská:t{aˈ} ‘louse’; PMZ *{ʔa}wat ‘louse’.

(Tz122) *šk^{y}wa | PTn *ška ‘bite; hurt’; PZ *was ‘chew’ [PMZ *wa{s}]. [Note: ChZ *was* ‘chew, bite’ and AyZ *was* ‘bite, to hurt’.]

(Tz123) *ška: | PTn *šqa: ‘harvest corn, shuck corn’; PMZ *ka{ma} ‘cornfield’.

(Tz124) *škEhkʔ | PTn *šqiˈq{íˈn} ‘type of bird’; PMZ *ke:kʔ ‘to fly’. [Note: PM *ke:k-an ‘wing’.]

(Tz125) *škuk | PTn *šquq ‘row (of plants), furrow’; PMZ *kuk ‘middle’. [Note: NHM *kuhk* ‘vertical, straight’.]

(Tz126) *šləm | PTn *šlám{uˈ} ‘dew, dewdrops’; PM *yəməm ‘to drizzle’ [PMZ *yəm{əm}].

(Tz127) *šnihʔk | PTn *šniq- ‘wilt, dry out (plant, flower)’; PM *ni:ʔk{š} ‘to fade, dry (flower)’ [PMZ *ni:ʔks].

(Tz128) *šokI | PTn *šúqiˈ ‘snail, slug’; PZ *soki ‘snail’ [PMZ *soki].

(Tz129) *štAhkʔ ~ *štIhkʔ | PTn *štaˈq- ~ *štiˈq- ‘woven sleeping mat’; PMZ *ta:kʔ ‘to weave’.

(Tz130) *štapu | PTn *štápu ‘bean’; PZ *tapu ‘wart’ [PMZ *tapu].

(Tz131) *štuq- | PTn *štuq- ‘gather together$_{INTR}$, meet’; PZ *tuʔm ‘to gather’ [PMZ *tuʔ{m}].

(Tz132) *štɔʔp | PTn *štap{ú} ‘dam (water), disturb’; PGZ *toʔp ‘to hamper’ [PMZ *toʔp]. [Note: Cc *toʔpɸəʔy* ‘to become obstructed or blocked’.]

(Tz133) *šU:n | PTn *šúːˈn ‘bitter’; POM *šuhn ~ šun ‘to become sour’ [PMZ *su:n]. [Note: POM *šu:hn is expected.]

(Tz134) *šwA: | PTn *šwáːˈ{tiˈ} ‘metate’; PMZ *wa{y} ‘to grind’. [Note: TxZ *way* ‘grind (with metate)’.]

(Tz135) *šwəʔnk | PTn *šwanq- ‘open, having a cavity’; POM *ʔa-wəʔk ~ *ʔa-wəʔək ‘to open the mouth’, PZ *ʔah-wak ‘to open’ [PMZ *wəʔk].

(Tz136) *šyak | PTn *štaq ‘leave something, give’; PMZ *yak ‘give’.

(Tz137) *taɬ | PTn *táɬ{u} ‘rash, skin disease’; PMZ *tay ‘to scar’.

(Tz138) *tE:t | PTn *ti:ˈt- ‘tear, split, rip’; PZ *tet ‘to split, tear’ [PMZ *te:t].

(Tz139) *ti: | PTn *ti: ‘what?, who?’; PMZ *ti ‘what?’.

(Tz140) *tik ~ *tuk or *tok | PTn *tuq- ‘touch, feel, strike’; PZ *tikin ‘to touch’ [PMZ *ti{kin}].

(Tz141) *tin | PTn *{(ʔiɬ)}tín ‘excrement’ and PTn *{tan}tín ‘defecate’ (*tan- ‘anus’ + *tin ‘excrement’); PMZ *tin ‘excrement’.

(Tz142) *tOqO | PTn *túˈqu ‘old woman’; POM *toʔošy-təhk ‘woman’ [PMZ *toʔo].

(Tz143) *tOʔnk ~ *tOʔnkʸ | PTn *tuˈnq- ‘spread$_{TR}$, stretch$_{TR}$, extend$_{TR}$’; PMZ *toʔk ‘to spread out on the ground’.

(Tz144) *tUkʸ | PTn *tuˈk ‘snap off, break off ’; PMZ *tuk ‘pick fruit’.

(Tz145) *tum | PTn *tum ‘one’; PMZ *tum ‘one’.

(Tz146) *təhɬ | PTn *taɬ{a-} ‘tooth’; PMZ *tə:ɬ ‘tooth’.

(Tz147) *tənkʸw | PTn *stánk{uˈ} ‘younger sibling’ (= *s- ‘diminutive’ + *tánkuˈ); PZ *təwə ‘brother’ [PMZ *təw{ə}].

(Tz148) *tƏnkʸw | PTn *taˈnk{s} ‘straight, correct’; PMZ *təw ‘be upright, straight’. [Note: POM *təwy ‘true’.]

(Tz149) *tɨ:ɬʔ | PTn *ti: ‘dry up’; PMZ *tə:ɬʔ ‘to dry out, become thin’.

(Tz150) *tɨhʔ | PTn *ti{wí} ‘rock$_{TR}$, swing$_{TR}$’; PM *tə:ʔy ‘to rock’ [PMZ *tə:ʔ{y}]. [Note: SaP *təʔy* ‘swing’.]

(Tz151) *tɬm ~ *tɬn | PTn *tiˈn ‘seed’; PMZ *təm ‘fruit’.

(Tz152) *tɨp | PTn *tip- ‘shoot arrow’; PMZ *təp ‘stab, shoot with arrow’.

(Tz153) *tʸEhʔn | PTn *čiˈn{táˈ} ‘kick’; PMZ *te:ʔn ‘to step on, to tread on, to trample, stand up’.

(Tz154) *tʸih | PTn *či{wí:} ‘speak’; POM *tih ‘say’ [PMZ *tih].

(Tz155) *tʸU:ʔn | PTn *čuːˈn ‘vulture’; PZ *tuʔnuk ‘turkey’ [PMZ *tu:ʔn{uk}]. [Note: The superficial resemblance between vultures and wild turkeys is the likely basis for the common English name for *Cathartes aura*, Turkey Vulture.]

(Tz156) *tʸuk | PTn *-čuq{ú} ‘stopped’; PMZ *{ʔaw-}tuk ‘to close’. [Note: Ja *ʔadúk* ‘to stop’.]

(Tz157) *tʸək (cf. *tʸɨkʸ) | PTn *čaq{a:-} ‘house’; PMZ *tək ‘house’. [Note: The PMZ form could occur in either of two cognate sets, meaning that only one of the two sets is valid if this is not otherwise explained by the alternation of *k* and *q* found in some Tn languages.]

(Tz158) *tʸəʔkš | PTn *čaqš- ‘cut off, cut down, snap off ’; PZ *təʔks ‘to break or cut’ [PMZ *təʔks]. [Note: NE *təʔks* ‘cut with a machete, chop into chunks’.]

(Tz159) *tʸɨky (cf. *tʸək) | PTn *čik ‘house, home’; PMZ *tək ‘house’. [Note: The PMZ form could occur in either of two cognate sets,

meaning that only one of the two sets is valid if this is not otherwise explained by the alternation of *k* and *q* found in some Tn languages.]

(Tz160) *¢amwA | PTn *¢áwaˈ ‘amaranth’; PMZ *¢ama{m} ‘a kind of edible green’. [Note: NHM *¢ámən* ‘quintonil (*Amaranthus hypocondricus*)’].

(Tz161) *¢I | PTn *¢iˈ ‘black’; POM *¢iš-y ‘dark’ [PMZ *¢i{s}]. [Note: POM *¢ihš ~ ¢iš ‘to become sooted’; Cn *¢išy* ‘color black’; SJ *¢ihš ~ ¢iš* ‘to blacken’.]

(Tz162) *¢I | PTn *¢íˈ¢iˈ ‘infection, sore, canker’; PMZ *¢í{pin} ‘wart’. [Note: Perhaps, originally, literally ‘pimple red’ (see PTz *piˈn).]

(Tz163) *¢Iʔč | PTn *¢iˈk{íːˈ} ‘suckle’; PM *¢iʔ¢ ‘suckle’ [PMZ *¢iʔ¢].

(Tz164) *¢oʔč | PTn *¢uk{ú} ‘begin’; PZ *¢oʔ¢ ‘begin’ [PMZ *¢oʔ¢].

(Tz165) *¢əkʸəː | PTn *¢aká:{t} ‘rubber, elastic’ [note: U *¢aká:t* ‘Gumtree’]; PM *¢əkək ‘Gumbolimbo (*Bursera* spp.)’ [PMZ *¢əkə{k}].

(Tz166) *¢Ɨː | PTn *¢iːˈ ‘mother’; PM *¢əʔ ‘older sister, aunt’; PZ *¢ə¢ə ‘older sister, aunt’ [PMZ *¢ə].

(Tz167) *¢Ɨːʔ | PTn *-¢iːˈ ‘tight, closed, blocked’; PM *¢əʔkš ‘to become tight’ [PMZ *¢əʔ{ks}].

(Tz168) *¢Uːʔkʸ | PTn *¢uːˈk- ‘kiss’; PM *¢uːʔkš ‘kiss’ [PMZ *¢uːʔk{s}].

(Tz169) *¢Uk | PTn *¢uˈq- ‘write, draw, paint’; PMZ *¢uk{s} ‘to scratch, to sketch, to outline’.

(Tz170) *¢Uʔ¢ | PTn *¢uˈ¢{úˈ} ‘suck’; PMZ *¢uʔ¢ ‘suckle, bite’.

(Tz171) *wan | PTn *wan ‘say’; POM *wanahn ~ *wanaʔan ‘to say’, PZ *wan ‘to sing’ [PMZ *wan].

(Tz172) *wiːʔt | PTn *-wiːt ‘twisted, winding, curved’; PMZ *wiːʔt ‘to twist’.

(Tz173) *wiʔk | PTn *wiq ‘[repetitious noise]’; PM *wiːk ~ *wiʔk ‘to whistle’ [PMZ *wiʔk].

(Tz174) *wɔːʔk | PTn *waːq ‘scratch, dig’; PMZ *woːʔk ‘to grasp a fistful of something’. [Note: Cn *<wo.k ~ wo:k* → (vt) ‘dig’, Gu *<wo:k, wʸo.ʔpʸ* → ‘scratch, scratch (leaving a mark)’.]

(Tz175) *wɔhʔš | PTn *waš- ‘scratch’; PMZ *woːʔs ‘to scrape’.

(Tz176) *wəkʸ | PTn *wak- ‘planeV’; PZ *wək ‘to slice’ [PMZ *wək].

(Tz177) *wƏt | PTn *waˈt{áˈ} ‘saw’; PZ *wət ‘break’ [PMZ *wət]. [Note: SoZ *wə:t* ‘chop down’.]

(Tz178) *wƏʔkʸ | PTn *waˈk{áˈ} ‘be high’; PZ wəʔks ‘to hook’ [PMZ *wəʔk{s}]. [Note: N *wəʔks* ‘hook something, hang something’.]

(Tz179) *xaːkʸ ~ *waːkʸ | PTn *xáːk{aˈ} ‘Marmalade Fruit’; PM *kaʔwak ‘Red Sapote’ [PMZ *{kaʔ}wak].

(Tz180) *xoːh | PTn *-xu: ‘into downward’; PM *hoːht-pi ‘inside’, PZ *hoh ‘contents’ [PMZ *hoh]. [Note: PM *hoht-pi is expected.]

(Tz181) *xon | PTn *xun ‘hummingbird’; PMZ *hon ‘bird’.
(Tz182) *x(əy)u:k^{y} | PTn *xú:k{iˈ} ‘deer’; POM *həyuk ‘beast of burden’ [PMZ *həyuk]. [Note: Ju, Ja *həyúhk* ‘animal, horse’.]
(Tz183) *xin | PTn *xin ‘smoke$_{V}$’; PM *həhn ‘fire, cooking fire’ [PMZ *hən].
(Tz184) *yA | PTn *{¢aˈ}táˈtaˈ ‘soft’; PZ *ʔuya ‘soft’ [PMZ *{ʔu}ya].
(Tz185) *yahʔk^{y} ~ *yehʔk^{y} | PTn *{s}tak- ‘grow’; PM *ye:ʔk ‘grow’ [PMZ *ye:ʔk].
(Tz186) *yAʔs | PTn *taˈs{á} ‘cry, yell, vocalize’; PM *yaʔš ~ *ya:š ‘cry, yell’ [PMZ *yaʔs].
(Tz187) *yeɬ ~ *yeʔɬ | PTn *tiɬ- ‘spread out (to dry)’; PMZ *ye(ʔ)y ‘to lay out (. . . beans), dry’.
(Tz188) *yoqo- | PTn *tuqú ‘jab, prick, poke’; POM *yoʔ¢ ~ *yoʔo¢ ‘to pierce’ [PMZ *yoʔo{¢}].

7. Discussion. The data presented above provide evidence for the proposal that languages of the Totonacan and Mixe-Zoquean families are descended from a common ancestor. Although the genetic linkage of Tn and MZ has been postulated by others (Belmar 1910, Whorf 1935, McQuown 1942; 1956, Witkowski and Brown 1978, Greenberg 1987, and Campbell 1997:324), this study is the first to compile extensive comparative evidence for the hypothesis.[26] For the most part, previous proposals have been part of larger schemes of related families. However stated, the basic hypothesis has typically been presented in the absence or near-absence of explicit, supporting evidence.

Swadesh (1954), for example, compared lexical evidence from Chiapas Zoque, Totonac, Yucatec Maya, and Huave, concluding that Chiapas Zoque and Totonac are the most closely related of these languages and claiming, on the basis of eight to ten CVC correspondences, that relatedness between the two is an “extremely safe conclusion.” Subsequently, Swadesh (1959) restates the hypothesis, proposing a “Macro-Mixe” grouping consisting of Zoquean and Totonac. This hypothesis resurfaces in a later work (Swadesh 1961), where an inventory of phonemes for the hypothetical ancestor of Totonacan, Mixe-Zoquean, and Mayan is presented.[27]

The present work differs in two important ways from previous proposals for a genetic link between Tn and MZ. First, earlier compilations of lexical similarities are nowhere close in size to the robust assemblage of the current

[26] This evidence involves only phonology and the lexicon. We have yet to undertake comparative investigation of grammar.

[27] There have been other proposals relating MZ to various different groups as well; for example, Suárez (1975) links MZ to Huave, Brown and Witkowski (1979) link it to Mayan, and Wichmann (2003) links it to Uto-Aztecan. Further comparative work is required to evaluate these proposals and how they relate, if at all, to the Totozoquean hypothesis.

investigation. Second, when they do provide evidence, earlier proposals are based on comparisons of words from individual languages. In contrast, the comparative corpus of this study proceeds from reconstructed lexicons of parent languages of Tn and MZ. The individual-language approach of earlier proposals/efforts greatly augments the possibility that observed lexical similarities are the result of chance or borrowing rather than other factors such as genetic relationship. Coincidental resemblance is significantly reduced by limiting comparative analysis to proto-forms.

The findings of this study are consistent with recent work by the Automated Similarity Judgment Program (ASJP) consortium, which uses computer automation to classify languages according to lexical similarity. ASJP has produced a classificatory tree for more than half of the world's approximately 6,500 languages (Müller et al. 2009).[28] On this huge tree, Tn and MZ languages are uniquely branched together to the exclusion of any other of the world's languages, attesting to their special lexical resemblance, if not to their genetic affiliation. In fact, this finding was one of the motivations for our revisiting the long-neglected hypothesis that the two families might be genetically linked.

The ASJP consortium also assembles evidence relating to the chronological depth of Totozoquean (Holman et al. [n.d.]). Through automated judgment of lexical similarity, ASJP produces similarity scores holding between all possible pairs of languages of a genetically related group. This allows comparison of Proto-Totozoquean and other proto-languages of the world with respect to the average degree of lexical similarity among their respective offspring branches. On a scale from 0 to 100, with 0 indicating no lexical similarity and 100 indicating complete lexical identity, the average lexical similarity between Tn and MZ languages is 5.55. This compares to an average of 5.56 between languages in the different major branches of Indo-European (excluding from consideration Anatolian and Tocharian languages), which suggests that the chronological depth of Proto-Totozoquean is about the same as that for Proto-Indo-European. By way of comparison, the average lexical similarity between Totonac and Tepehua languages is 38.4, and that between Mixean and Zoquean languages (minus Tapachultec) is 38.6. These two similarity scores indicate that the chronological depths for both Tn and MZ are somewhere between the dates at which Proto-Slavic and Proto-Romance respectively diverged into daughter languages.

The lexical similarity apparent for languages of the Tn and MZ families has also been recognized in a recent paper by Kaufman and Justeson (2008), who attribute it largely to diffusion rather than to genetic relationship. A number of the forms regarded by these authors as being loans from one of

[28] The tree can be accessed at the consortium's web page: ⟨http://email.eva.mpg.de/~wichmann/ASJPHomePage.htm⟩.

the families into the other (see especially Kaufman 2007) are included in our Tz cognate sets in **6**.[29] Some of these may indeed be loans, but Kaufman (2007) does not provide detailed evidence in support of his view.[30] We prefer to treat such similarities as due to inheritance until such evidence of borrowing is forthcoming. Whatever the decisive evaluations of individual instances of lexical similarity may eventually be, given the large number of supporting cognate sets and the systematicity of sound correspondences, we are confident that ours is a convincing case for Tn and MZ lexical similarity being due, in greatest part, to common inheritance.

APPENDIX A
Language Abbreviations, Family Identifications, and Sources

Abbreviations of names for languages used in this study are listed here in alphabetical order. Languages are also identified with respect to genetic affiliation (either Totonacan [Tn] or Mixe-Zoquean [MZ]). In addition, the source for information on each language is given in parentheses. Wichmann (1995) is presented as "W."

A	Apapantilla Totonac [Tn] (Reid and Bishop 1974)
AyZ	Ayapa Zoque [MZ] (W)
C	Coatepec Totonac [Tn] (McQuown 1990)
Cc	Central Chiapas Zoque [MZ] (W)
ChZ	Chimalapa Zoque [MZ] (W)
Cn	Coatlán [MZ] (W)
Co	Coyutla Totonac [Tn] (lexical database prepared by H. Aschmann)
Cp	Zoque Copainalá [MZ] (Harrison and García 1981)
FM	Filomeno Mata Totonac [Tn] (lexical database prepared by T. McFarland)
GU	Guichicovi [MZ] (W)
H	Huehuetla Tepehua [Tn] (Smythe Kung 2007 and p.c.)
HT	Huehuetla Totonac (Troiani 2004)
Ja	Jaltepec [MZ] (W)
Ju	Juquila [MZ] (W)
LM	Lowland Mixe [MZ] (W)
M	Misantla Totonac [Tn] (MacKay and Trechsel 2005)
N	Northern Chiapas Zoque [MZ] (W)
NE	Northeastern Chiapas Zoque [MZ] (W)
NHM	North Highland Mixe [MZ] (W)
Ol	Olintla Totonac [Tn] (word list prepared by Jorge Tino; Jorge Tino, p.c.)
Olp	Oluta Popoluca [MZ] (W)

[29] We have excluded two additional sets with forms that have been widely discussed as possibly diffused: sets with words designating copal (incense) and cacao.

[30] Many of the putative borrowings identified by Kaufman pertain to basic, everyday vocabulary. This would seem to contradict his proposal that words have diffused primarily due to interaction among elites rather than among common folk.

Oz	Ozelonacaxtla Totonac [Tn] (word list prepared by Gabriela Román Lobato)
P	Papantla Totonac [Tn] (Aschmann 1973*a* and amendments thereto by P. Levy)
Pf	Pisaflores Tepehua [Tn] (Albert Davletshin, p.c.; additional data from J. Watters)
PGZ	Proto-Gulf Zoquean [MZ] (W)
PM	Proto-Mixean [MZ] (W)
PMZ	Proto-Mixe-Zoquean [MZ] (W)
Pn	Pantepec Totonac [Tn] (word list prepared by Gabriela Román Lobato)
POM	Proto-Oaxaca Mixean [MZ] (W)
PTn	Proto-Totonacan [Tn]
PTz	Proto-Totozoquean
PZ	Proto-Zoquean [MZ] (W)
SaP	Sayula Popoluca [MZ] (W)
SJ	San José Paraíso [MZ] (W)
SoZ	Sierra Popolua [MZ] (W)
T	Tlachichilco Tepehua [Tn] (Watters 2007)
To	Mixe Totontepec [MZ] (Schoenhals and Schoenhals 1965)
Tp	Tepehua
Tot	Totonac [Tn]
TxZ	Texistepec Popoluca [MZ] (W)
U	Upper Necaxa Totonac [Tn] (Beck 2011)
Z	Zapotitlán de Méndez Totonac [Tn] (Aschmann 1973*b*)

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