PHONATION TYPES AND TONE IN ZAPOTEC LANGUAGES:

A SYNCHRONIC COMPARISON

ANDREA ARIZA GARCIA


MEXICO
GULF OF MEXICO
PACIFIC OCEAN
OAXACA

1. ZAPOTEC CIVILIZATION

- Native pre-Columbian civilization – Valley of Oaxaca, Mexico
- 2500 years ago – 6th Century BC
- Monte Albán was one of the major cities in Mesoamerica
- Etymology – Nahuatl exonym – *tzapotēcah,*

inhabitants of the place of sapote.

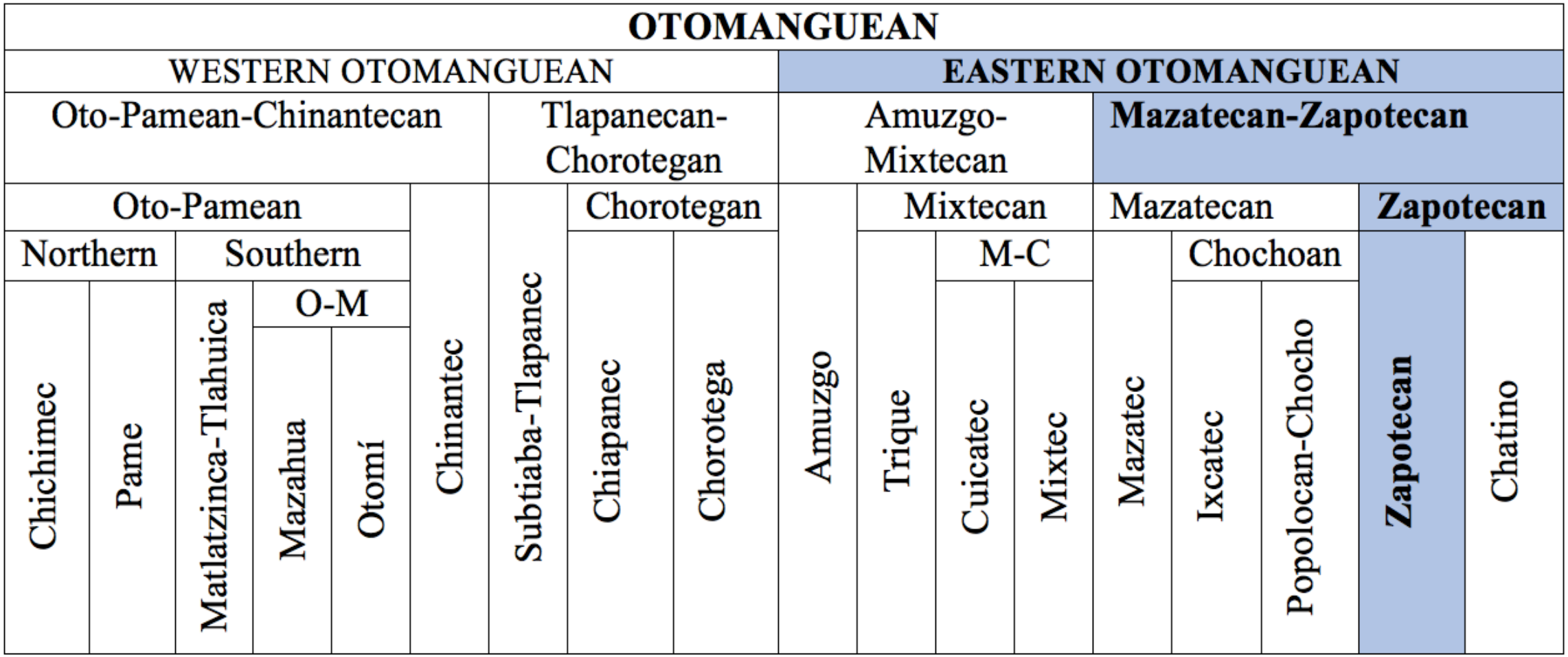
[beʔenaʔa zaʔa], the cloud people.

- Polytheistic
- Calendar and logosyllabic system
- Battles against Aztecs 1497-1502. Defeated by the

Spaniards in 1522 and 1527.

2. THE LANGUAGES

2.1 PHYLUM *Otomanguean family* (Beam de Azcona 2004 ; Kaufman 2004)



2.2 THE LANGUAGES

Around 50 unintelligible varieties

Agglutinative languages

VSO

Alienable/Inalienable nouns

Complex verbal morphology

Complex phonological system

***Laryngeally complex* (Silverman 1997:236)**

- **Contrastive Tones**
- **Contrastive phonation types in vowels**
- Lenis-Fortis consonants
- Sonority Sequence Hierarchy
- Stress

Sample of languages

3. PHONATION TYPES

- Function of the laryngeal system to transform the airstream into audible sound.
- The different degrees of glottal opening are used cross-linguistically to manifest linguistic contrast. Languages may have two, three or four-way contrast systems –or none.
- Phonation types result from the different manners in which vocal folds vibrate.

Figure 4.2. *Continuum of phonation types* (Ladefoged 1971)

3.1 PHONATION TYPES IN ZAPOTEC VOWELS

Zaachila Zapotec, (Ariza García 2014)

Modal	**Creaky**	**Glottalized**	**Breathy**
[dé] *ashes*			[dè̤] *flour*
	[na̰ʧ] *scratchy*		[nà̤dʒ] *wet*
[nálth] *cold*	[nàl̰th] *thick*		
[ʃĩ] *what*		[sìʔ h] *nose*	
	[nàgâ̰ʔ] *raw*	[nàgáʔ] *green*	
		[júʔ] *home*	[jṳ̀] *earth*

4. TOWARDS A TYPOLOGY OF PHONATION TYPES IN ZAPOTEC

Reconstructions of proto-Zapotec (Fernandez de Miranda 1995; Suárez 1973) suggest the presence of two types of non-modal vowel phonation: glottalized and laryngealized [creaky].

	VALLEY				ISTHMUS	SOUTHERN			NORTHERN	
PHONATION TYPES	**ZZ**	**SLQZ**	**SAVZ**	**SPGZ**	**JZ**	**SDMZ**	**SPMZ**	**SAMZ**	**YZ**	**BZ**
MODAL	*	*	*	*	*	*	*	*	*	*
GLOTTALIZED	*	*	*	*	*	*		*	*	*
LARYNGEALIZED	*	*		*	*		*	*	*	*
BREATHY	*	*	*							

TYPE 1 : retention of proto-language phonation types

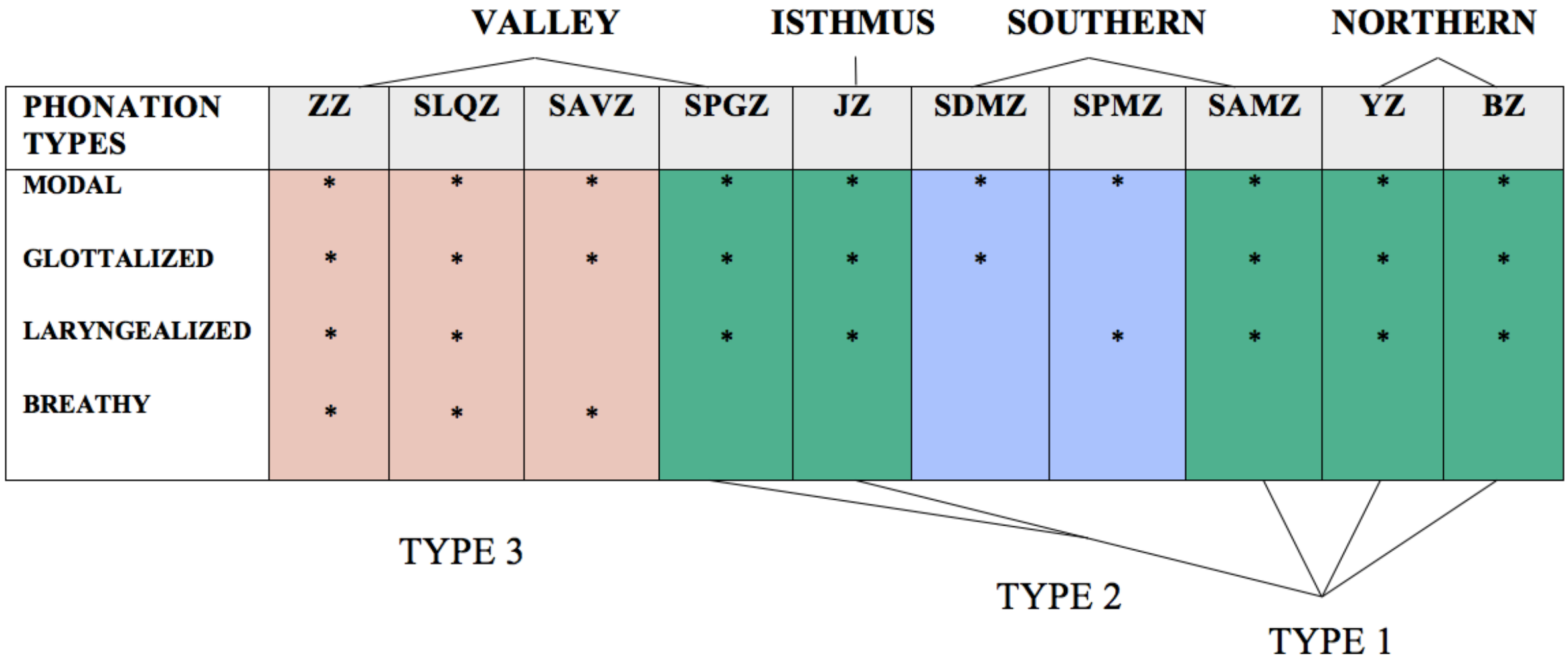
	VALLEY				ISTHMUS	SOUTHERN			NORTHERN	
PHONATION TYPES	**ZZ**	**SLQZ**	**SAVZ**	**SPGZ**	**JZ**	**SDMZ**	**SPMZ**	**SAMZ**	**YZ**	**BZ**
MODAL	*	*	*	*	*	*	*	*	*	*
GLOTTALIZED	*	*	*	*	*	*		*	*	*
LARYNGEALIZED	*	*		*	*		*	*	*	*
BREATHY	*	*	*							

TYPE 2: loss of one phonation type [glottalized or laryngealized]

	VALLEY				ISTHMUS	SOUTHERN			NORTHERN	
PHONATION TYPES	**ZZ**	**SLQZ**	**SAVZ**	**SPGZ**	**JZ**	**SDMZ**	**SPMZ**	**SAMZ**	**YZ**	**BZ**
MODAL	*	*	*	*	*	*	*	*	*	*
GLOTTALIZED	*	*	*	*	*	*		*	*	*
LARYNGEALIZED	*	*		*	*		*	*	*	*
BREATHY	*	*	*							

TYPE 3: develop of breathy phonation in vowels

	VALLEY				ISTHMUS	SOUTHERN			NORTHERN	
PHONATION TYPES	**ZZ**	**SLQZ**	**SAVZ**	**SPGZ**	**JZ**	**SDMZ**	**SPMZ**	**SAMZ**	**YZ**	**BZ**
MODAL	*	*	*	*	*	*	*	*	*	*
GLOTTALIZED	*	*	*	*	*	*		*	*	*
LARYNGEALIZED	*	*		*	*		*	*	*	*
BREATHY	*	*	*							


VALLEY
ISTHMUS
SOUTHERN
NORTHERN
PHONATION TYPES
ZZ
SLQZ
SAVZ
SPGZ
JZ
SDMZ
SPMZ
SAMZ
YZ
BZ
MODAL
GLOTTALIZED
LARYNGEALIZED
BREATHY
TYPE 3
TYPE 2
TYPE 1

5. PHONATION TYPES AND TONES

- Tone – “pitch scalar system” (Hyman 2010)
- Tone and voice register are not sharp boundaries
- Phonation plays an important role in the perception of certain tonal contrasts

    e.g. Vietnamese (Brunelle 2009), Green Mong (Andruski and Ratliff 2000) and White Hmong (Garellek et al. 2013)

(Zsiga, 2012: p. 198)

“should the definition of ‘tone’ be revised to include laryngeal contrasts other than pitch?”

6. PHONATION TYPES AND TONES (Kuang 2013)

Phonation independent from tone

- the phonation contrast has no effect on F0
- the tone contrast has no effect on Contact Quotient
- CQ and F0, are not correlated.

↓

- tone and phonation are phonologically contrastive and phonetically independent.
- Yi (Kuang 2013), Mpi (Silverman 1997), Mazatec (Garellek and Keating 2011), White Hmong (Esposito 2012)

Phonation dependent from tone

- voice quality is tied to F0
- Non-modal phonation is allophonic or a secondary cue for tonal contrast

↓

- voice quality is predictable from F0.
- Mandarin, Cantonese (Kuang 2013)

Mixed system
Laryngeally complex

- Contrastive phonation and contrastive tones
- combined contrast and correlation between tones and phonation

↓

- non-modal phonation can be pitch-independent and thus phonemic
- non-modal phonation can also be pitch-dependent
- Black Miao (Kuang 2013), Some Zapotec languages

Phonation independent from tone	**Phonation dependent from tone**	**Mixed system** ***Laryngeally complex***
• the phonation contrast has no effect on F0 • the tone contrast has no effect on Contact Quotient • CQ and F0, are not correlated.	• voice quality is tied to F0 • Non-modal phonation is allophonic or a secondary cue for tonal contrast	• Contrastive phonation and contrastive tones • combined contrast and correlation between tones and phonation
• tone and phonation are phonologically contrastive and phonetically independent. • Yi (Kuang 2013), Mpi (Silverman 1997), Mazatec (Garellek and Keating 2011), White Hmong (Esposito 2012)	• voice quality is predictable from F0. • Mandarin, Cantonese (Kuang 2013)	• non-modal phonation can be pitch-independent and thus phonemic • non-modal phonation can also be pitch-dependent • Black Miao (Kuang 2013), Some Zapotec languages

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	LANGUAGES	VOWELS	TONES	PHONATION TYPES: MODAL	LARYNGEALIZED	GLOTTALIZED	BREATHY
VALLEY ZAPOTEC	ZAACHILA ZAPOTEC	[i, e, u, o a]	H L F R	* H L F R	* H L F ~~R~~	* H L ~~F R~~	* L F
	SAN LUCAS QUIAVINÍ ZAPOTEC	[i, ɨ, e, u, o, a]	H L F R	* H L F R	* H L F	* H L F	* L F
	SANTA ANA DEL VALLE ZAPOTEC	[i, ɨ, e, u, o, a]	H F R	* H R	* F		* F
	SAN PABLO GUILÁ	[i, ɨ, e, u, o, a]	H L F R	* H L F R	* H L F R	* H L F R	
ISTHMUS ZAPOTEC	ISTHMUS JUCHITÁN ZAPOTEC	[i, e, u, o, a]	H L F R LHL	* H L F R LHL	* L F R	* H L	
SOUTHERN ZAPOTEC	SANTO DOMINGO DE MORELOS ZAPOTEC	[i, e, ɛ, u, o, a]	H L F R	* H L F R		* H F	
	SAN PEDRO MIXTEPEC ZAPOTEC	[i, e, u, o, æ, a]	H L F R HH	* H L F R HH	* H L R		
	SAN AGUSTIN MIXTEPEC ZAPOTEC	[i, e, u, o, æ, a]	H L R	* H L R	* H L R	* H L	
NORTHERN ZAPOTEC	YALALÁG ZAPOTEC	[i, e, u, o, a]	H L F	* H L F	* H L F	* H L F	
	BETAZA ZAPOTEC	[i, e, u, o, a]	H L F R	* H L F R	* H L F R	* H L F	

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7. CONCLUSIONS AND FURTHER RESEARCH

7.1 CONCLUSIONS

Phonation types in Zapotec languages

Proto-Zapotecan – two types of non-modal phonation: glottalized and laryngealized.

- Type 1: Northern and Isthmus Zapotec languages have maintained the two non-modal vowels. But also some languages from the Valley and Southern Zapotec.
- Type 2: Southern Zapotec languages have simplified the contrast reducing it to one type of non-modal phonation : glottalized or laryngealized.
- Type 3: Valley Zapotec languages have not only retained the proto-Zapotecan contrast, but they have also developed a new phonation type: breathy voice.

Phonation and tone interaction:

Most of the languages – MIXED SYSTEM

San Pablo Guilá Zapotec and Yalalág Zapotec – INDEPENT SYSTEM

7.2 FURTHER RESEARCH

- Why the development of breathy voice? Contact?
- Correlations between phonation types in different languages - evolution
- More languages
- Measurements of tone and phonation
- More comparative analyses with other languages
- Better classification of the Zapotec languages

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Kíſtíòſbù

Спасиьа

Thanks