Tonally conditioned laryngogenesis in San Martín Peras Mixtec

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Acknowledgements

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Introduction

Tonogenesis: The diachronic development of contrastive tone, usually from a previous laryngeal contrast.

White Hmong (data from Ratliff 2015)	
*tɔ > tɔ^{55} ‘Deep’	*tɔh > tɔ^{33} ‘Pierced’

Introduction

Usually goes in one direction (Kingston 2011; Ratliff 2015)

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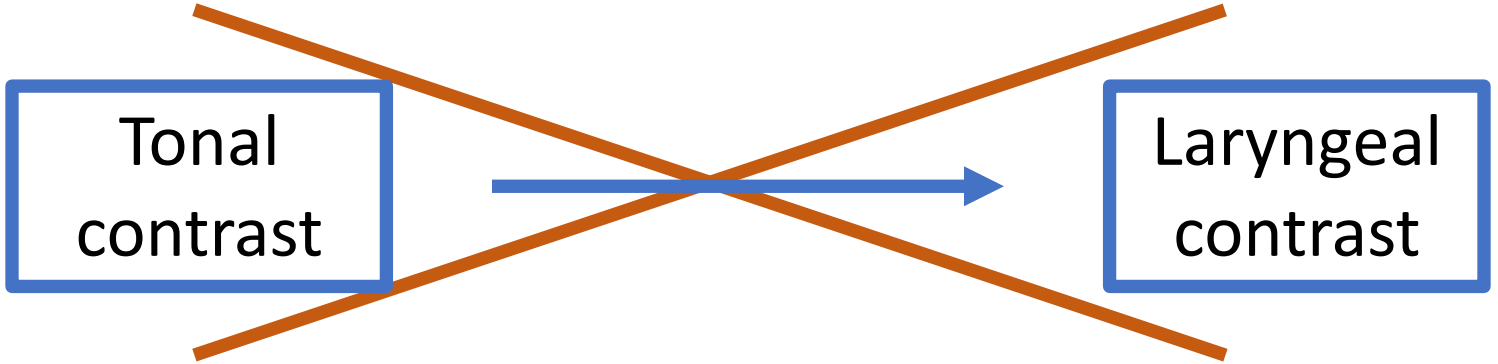
The opposite direction of change is nearly unattested (Uchihara 2016; Yang 2019)



Introduction

Only published example is Quiaviní Zapotec (Uchihara 2016)

Tone-to-laryngeal sound change	
*běll > bèll ‘Deep’	*bèll > bn̰ell ‘Pierced’

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We call this **tonally-conditioned laryngogenesis (TCL):** A tonal contrast gives rise to a laryngeal contrast

- The tonal contrast may then be lost, as in Quiaviní Zapotec (Uchihara 2016)

Introduction

This presentation: A case of tonally-conditioned laryngogenesis (TCL) in San Martín Peras Mixtec (SMP Mixtec; Otomanguean)

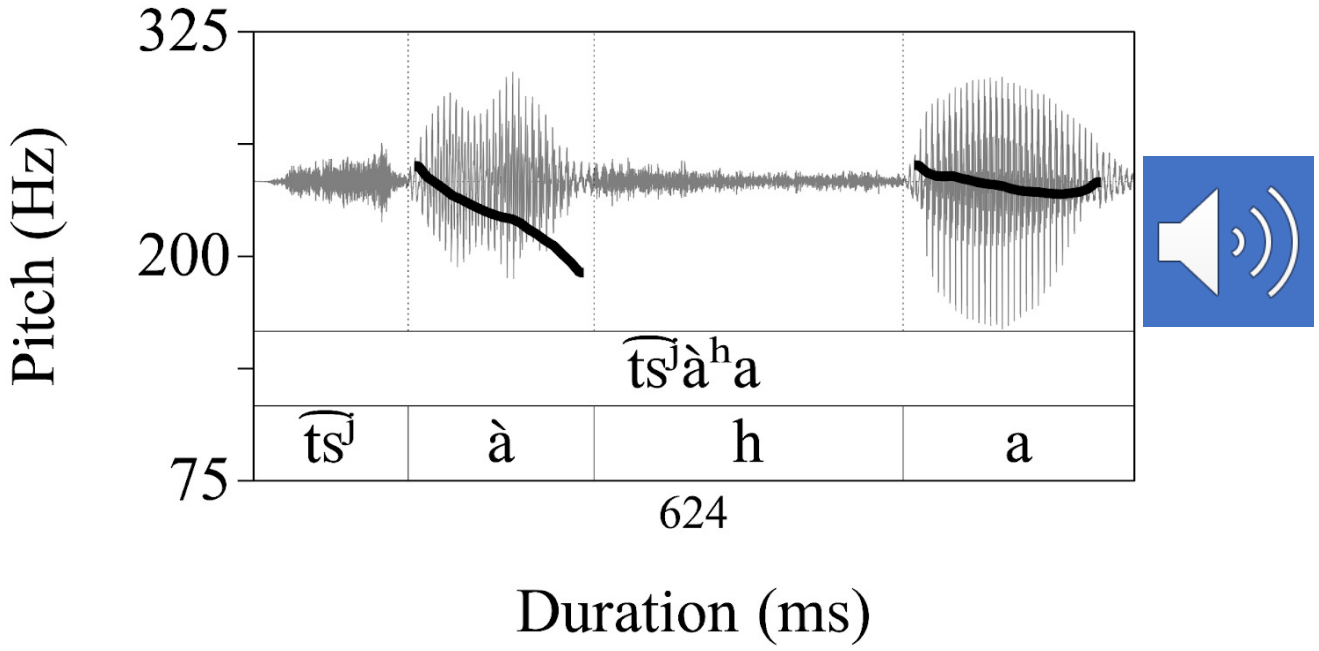
- Some words have medial [h]

Introduction

This presentation: A case of tonally-conditioned laryngogenesis (TCL) in San Martín Peras Mixtec (SMP Mixtec; Otomanguean)

- Some words have medial [h]

1. Tsiàja
   [t͡sʲàʰa]
   ‘Man’
   ‘Hombre’



Introduction

This presentation: A case of tonally-conditioned laryngogenesis (TCL) in San Martín Peras Mixtec (SMP Mixtec; Otomanguean)

- But cognates in other varieties do *not* have medial [h]

Ixpantepec Nieves (Carroll 2015)	**Silacayoapan** (Shields 1988)	**Alcozauca** (Mendoza Ruiz 2016)	**Ayutla** (Hills 1990)
[tʲàa]	[tàa]	[caa^{12}]	[tʲaà]

Introduction

This presentation: A case of tonally-conditioned laryngogenesis in San Martín Peras Mixtec (SMP Mixtec; Otomanguean)

Our proposal: [h] was innovated in tonal melodies involving a low-then-higher tone sequence

Proposed change
*t͡sʲàa > t͡sʲàʰa ‘Man’

Introduction

Two main pieces of evidence:

1. Words with [h] are in tonal complementary distribution with words without [h], and their cognates in other varieties do not have [h].
2. There is no systematic correspondence between SMP Mixtec words with [h] and cognates in Trique varieties, which also have [h]

SMP Mixtec

SMP Mixtec

Spoken by ~11,500 in and around San Martín Peras, Oaxaca, Mexico (INEG 2020)

Also spoken by diaspora communities in California (Mendoza 2020)

Ahuejutla, Oaxaca

SMP Mixtec

An Otomanguean language in the Amuzgo-Mixtecan subgroup

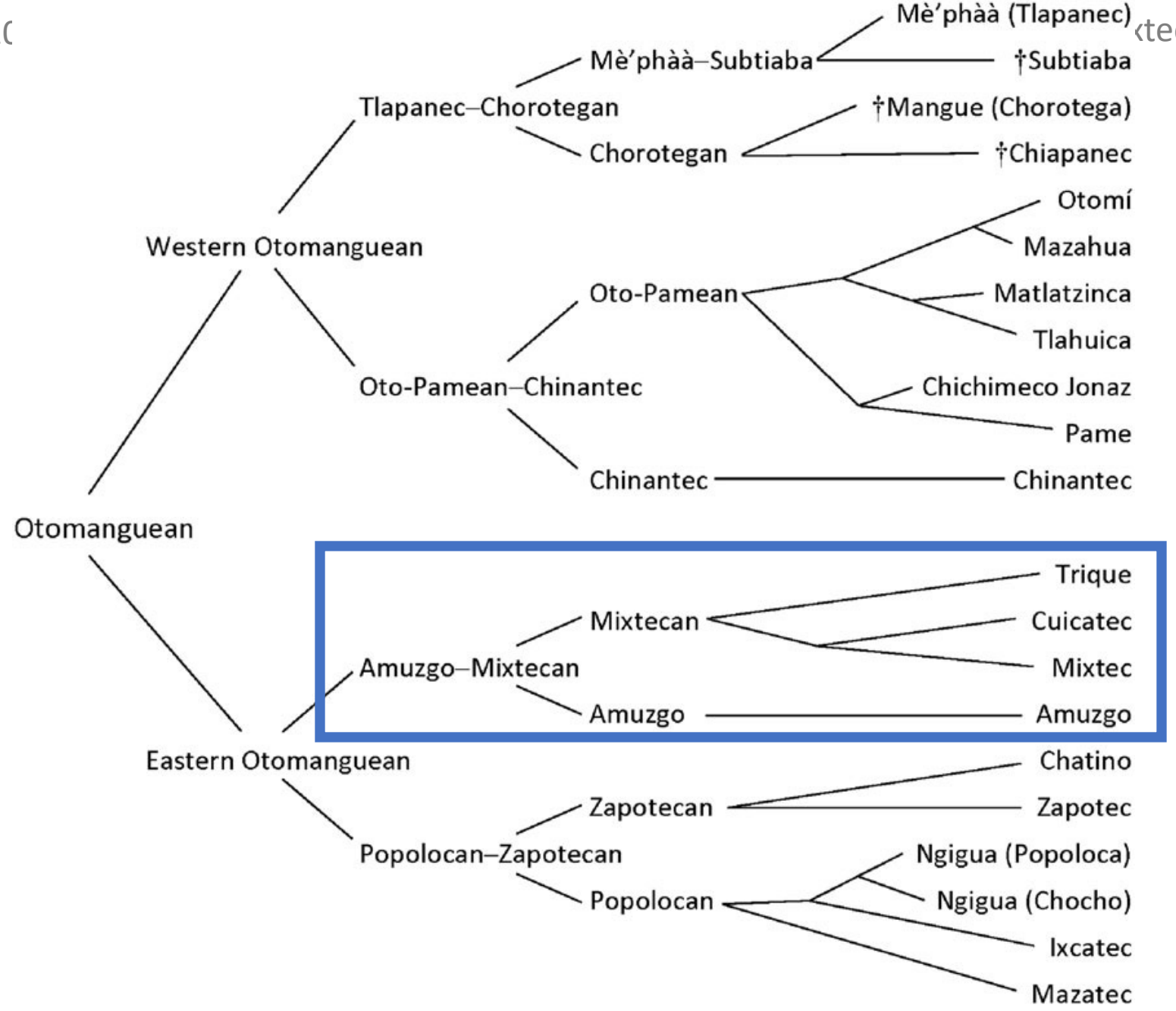
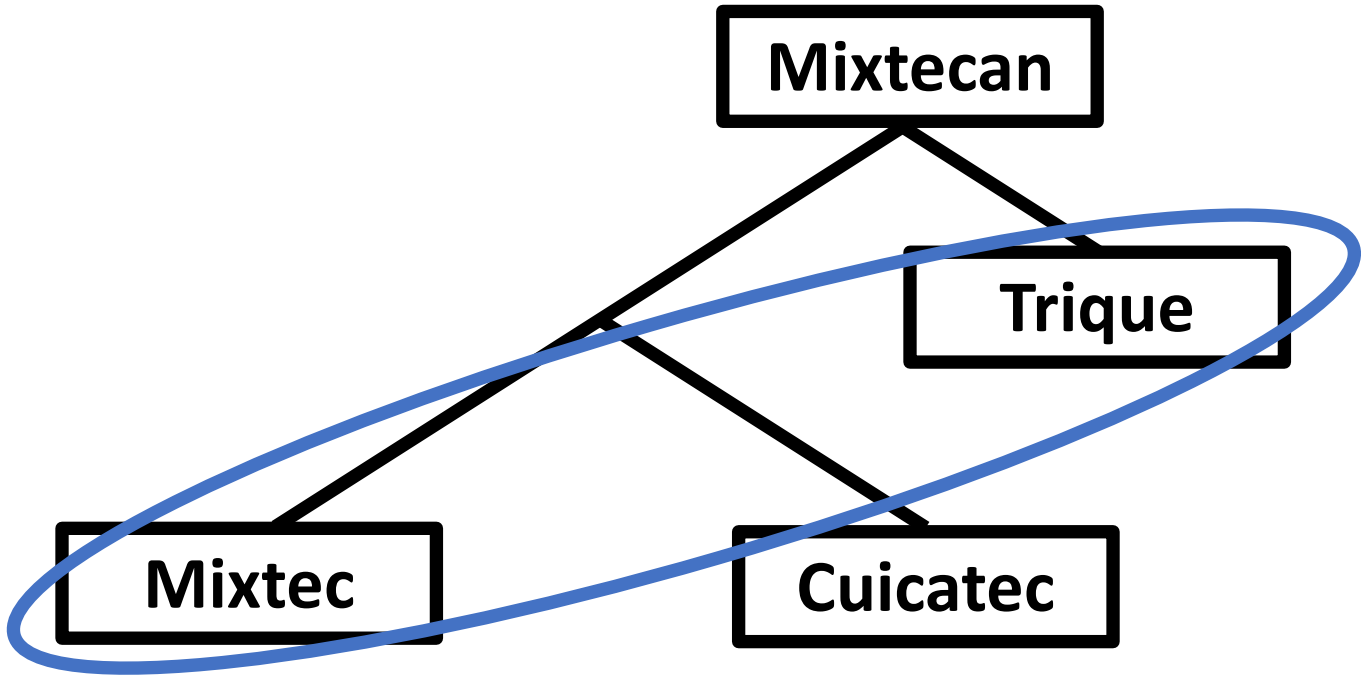


Diagram from Campbell (2017)

SMP Mixtec

In the Mixtecan major subgroup along with Trique and Cuicatec

- Comparison with Trique will be important later



SMP Mixtec

Canonical root shape is bimoraic, with optional onsets and no codas

CVCV	**VCV**	**CVV**	**VV**
Ntivi [ⁿtiβi] ‘beautiful’ ‘bonito’	Ìvì [ìβì] ‘two’ ‘dos’	Ntsìì [ⁿt͡sìì] ‘dead’ ‘muerto’	Iin [ĩĩ] ‘one’ ‘uno’




SMP Mixtec

Each mora may host one of (at least) five contrastive tones (Peters 2018) - H(igh), M(id), L(ow), R(ising), and F(alling)

H-L	**M-L**	**L-L**	**LH-L**	**HL-L**
Nánà [nɑ́nɑ̀] ‘mother’ ‘madre’	Konì [konǐ] ‘will see’ ‘verá’	Ònì [ònǐ] ‘three’ ‘tres’	Xǐyò [ʃǐjò] ‘dress’ ‘vestido’	Xânù [ʃânŭ] ‘cigarette’ ‘cigarillo’

SMP Mixtec

Ø ~ [ʔ] contrast following first mora; can be analyzed as laryngealized phonation (Eischens and Hedding to appear, cf. Peters 2018)

- **Laryngeally-complex** (Silverman 1997): Tone and phonation (nearly) fully cross-classified on the same TBU

H-L	**M-L**	**L-L**	**LH-L**	**HL-L**
Xá’nù [ʃáˀnṹ] ‘old’ ‘viejo/grande’	Sa’và [saˀβà] ‘frog’ ‘Rana’	Ì’vì [ìˀβì] ‘pain’ ‘dolor’	Mǎ’na [mǎˀnǎ] ‘sleepless’ ‘desvelado’	??

SMP Mixtec

Main points:

1. Common ancestor (Proto-Mixtecan) with Trique
2. At least five tones, including falling tones
3. Contrast between [V] and [V^{ʔ}] can be analyzed as modal vs laryngealized phonation

Tonal restrictions

Tonal restrictions

Unlike on roots with [ʔ], there are stringent tonal restrictions on roots with [h]

Roots with [h] are in tonal complementary distribution with words that have neither [ʔ] or [h].

- This can be understood if [h] was innovated on roots with particular tonal melodies.

Tonal restrictions

In a ~900-item database, [ʔ] is attested with many tonal melodies

Tone of mora 1 \ Tone of mora 2	**H**	**M**	**L**	**LH**
H	✓	✓	✓	✓
M	✓	✓	✓	✓
L	✓	✓	✓	✓
LH	✗	✓	✓	✗
HL	?	?	?	?
ML	?	?	?	?

Table:
Attested tonal melodies
on roots with [ʔ]

The distribution of [h]

[h] is only attested with **four** tonal melodies

Tone of mora 1 \ Tone of mora 2	H	M	L	LH
H	×	×	×	✓
M	×	×	×	✓
L	×	✓	×	✓
LH	×	×	×	×
HL	×	×	×	✓
ML	×	×	×	✓

Table:
Attested tonal melodies
on roots with [h]

Tonal restrictions

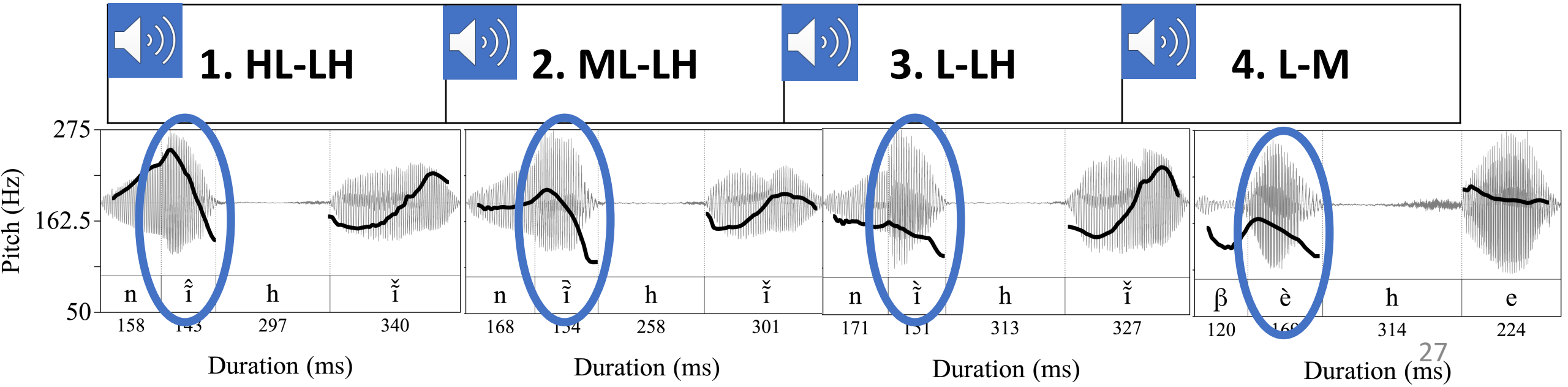
[h] is only attested with **four** tonal melodies

1. HL-LH	**2. ML-LH**	**3. L-LH**	**4. L-M**
Níjǐ [nî^{h}ǐ] ‘skinny’ ‘delgado’	Nijǐ [nī^{h}ǐ] ‘corn cob’ ‘mazorca’	Nìjǐ [nì^{h}ǐ] ‘blood’ ‘sangre’	Vèje [βè^{h}e] ‘heavy’ ‘pesado’

Tonal restrictions

Each melody with [h] contains…

a. An initial tone that ends **Low**

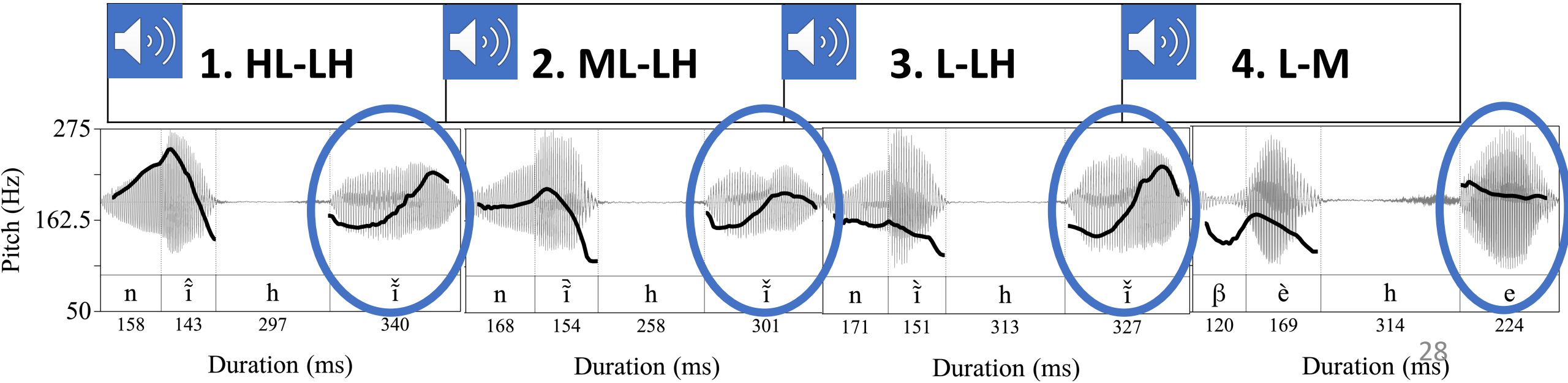


Tonal restrictions

Each melody with [h] contains…

a. An initial tone that ends **Low**

b. A final tone that is either **Rising** or **Mid**



Tonal restrictions

Generalization 1
[h] only occurs when Tone 1 ends **Low** and Tone 2 is **Rising** or **Mid**

Tonal restrictions

Roots without [ʔ] or [h] **never** have these tonal melodies

- These roots have a long vowel (1) or medial voiced consonant (2-3)
- We'll call these **CV(D)V** roots for convenience's sake

1. Ñuù [ɲũǔ̃] 'town' 'pueblo'	2. Òni [ònǐ̃] 'three' 'tres'	3. Lalò [lālò] 'crunchy' 'crujiente'

Tonal restrictions

CV(D)V roots have many melodies, but **not** those of roots with [h]

Tone of mora 1 \ Tone of mora 2	**H**	**M**	**L**	**LH**
H	✓	✓	✓	✓
M	✓	✓	✓	✓
L	✓	×	✓	×
LH	×	✓	✓	✓
HL	×	×	✓	×
ML	×	×	✓	×

Attested tonal melodies on CV(D)V roots

Tonal restrictions

CV(D)V roots have many melodies, but **not** those of roots with [h]

Tone of mora 1 \ Tone of mora 2	**H**	**M**	**L**	**LH**
H	✓	✓	✓	✓
M	✓	✓	✓	✓
L	✓	✗	✓	✗
LH	✗	✓	✓	✓
HL	✗	✗	✓	✗
ML	✗	✗	✓	✗

Attested tonal melodies on CV(D)V roots

Tonal restrictions

Generalization 1	**Generalization 2**
[h] only occurs when Tone 1 ends **Low** and Tone 2 is **Rising** or **Mid**	There are no CV(D)V roots with these tonal melodies

Tonal restrictions

Finally, cognates of SMP Mixtec roots with [h] are all CV(D)V roots:

San Martín Peras	Kuîjǐ [kʷîʰǐ] ‘green’ ‘verde’	Yòjǒ [jòʰǒ] ‘moon’ ‘luna’	Ntsiajyǐ [ⁿt͡sʲāʰjǐ] ‘broth’ ‘caldo’	Ìjmă [ìʰmǎ] ‘wax’ ‘cera’
Alcozauca (Mendoza Ruiz 2016)	[kʷii^{434}]	[ɻoo^{14}]	[ⁿdaɻu^{34}]	[ima^{14}]
Yucuquimi de Ocampo (León Vázquez 2017)	[kᶣîi]	[ʒòò]	[ⁿdéè]	[nìmà]
Silacayoapan (Shields 1988)	[kʷîi]	[jòò]	[ⁿdájì]	[ɲìmà]

Tonal restrictions

Generalization 1	**Generalization 2**	**Generalization 3**
[h] only occurs when Tone 1 ends **Low** and Tone 2 is **Rising** or **Mid**	There are no CV(D)V roots with these tonal melodies	Cognates of roots with [h] are all CV(D)V roots

Tonal restrictions

If [h] was innovated on CV(D)V roots with these melodies…

Generalization 1	**Generalization 2**	**Generalization 3**
[h] only occurs when Tone 1 ends **Low** and Tone 2 is **Rising** or **Mid**	There are no CV(D)V roots with these tonal melodies	Cognates of words with [h] are all CV(D)V roots

Then this tonal complementary distribution is predicted

Tonal restrictions

If [h] was innovated on CV(D)V roots with these melodies…

Generalization 1	**Generalization 2**	**Generalization 3**
[h] only occurs when Tone 1 ends **Low** and Tone 2 is **Rising** or **Mid**	There are no CV(D)V roots with these tonal melodies	Cognates of roots with [h] are all CV(D)V roots

And we capture the fact that cognates of roots with [h] are CV(D)V roots

Tonal restrictions

Argument:

[h] in SMP Mixtec is an **innovation** that was conditioned by tonal melody

Tonal restrictions

Two final points to consider:

1. What ties together the four melodies in which [h] was innovated?
2. Why might [h] have been innovated in these melodies?

Tonal restrictions

1. **What ties together the four melodies in which [h] was innovated?**

- HL-LH, ML-LH, and L-LH all have a **Low** and then a **LH rise**
- But L-M is **Low then Mid**

The melodies with [h] all involve a **Low tone** followed by a **higher tone**

- But, L-H also involves a Low followed a higher tone
- There are no L-H roots with [h]

Tonal restrictions

CV(D)V roots with L-H melodies are vanishingly rare

- We know of 8 CV(D)V roots with this melody

Their L-H melodies have alternative explanations, like…

- Vocative intonation
- Negative grammatical tone
- Lexicalized compounds

Tonal restrictions

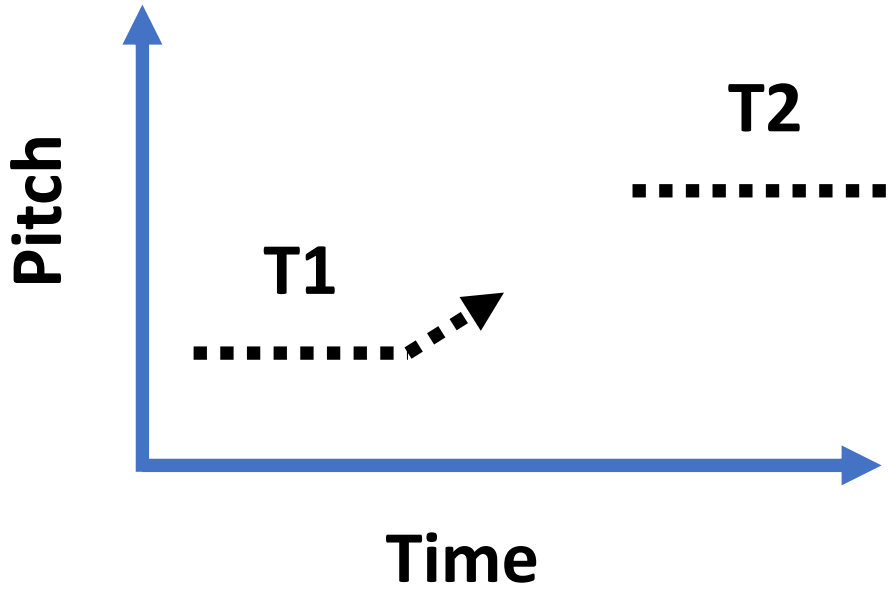
1. **What ties together the four melodies in which [h] was innovated?**

- The melodies with [h] all involve a **Low tone** followed by a **higher tone**
- L-H melody absent for independent reasons

Tonal restrictions

2. Why might [h] have been innovated in these melodies?

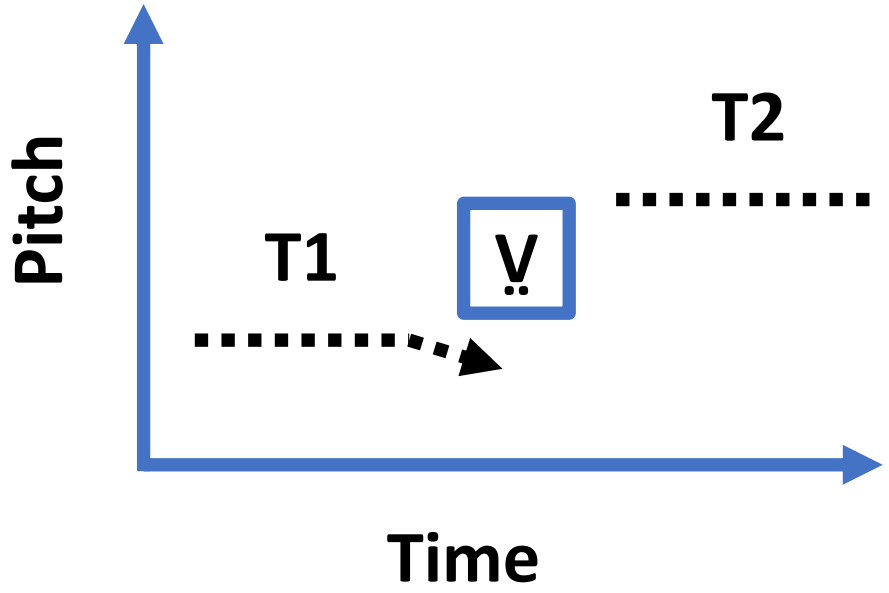
- When a lower tone followed by a higher tone, there is often coarticulatory pitch-raising of Tone 1 (e.g., Myers 2003; Chen et al 2018; cf. Hyman 2009; Flemming 2011)



Tonal restrictions

Pitch often lowers in breathy voicing (DiCanio 2009, 2012; Garellek and Keating 2011)

- [h] may have begun as breathy voicing, serving to counteract coarticulatory pitch-raising pressures



Tonal restrictions

What we've seen…

- [h] has a tonally restricted distribution, complementary distribution with CV(D)V roots
- Innovation of [h] has phonetic motivation

Conclusion:

[h] in SMP Mixtec is an **innovation** that was conditioned by tonal melody

But how do we know [h] wasn't retained from Proto-Mixtecan?

Comparative evidence

Comparative evidence

There are two logically possible explanations for the distribution of [h] in SMP Mixtec, and its absence in other varieties:

Hypothesis 1
SMP Mixtec innovated [h] in particular tonal melodies

Comparative evidence

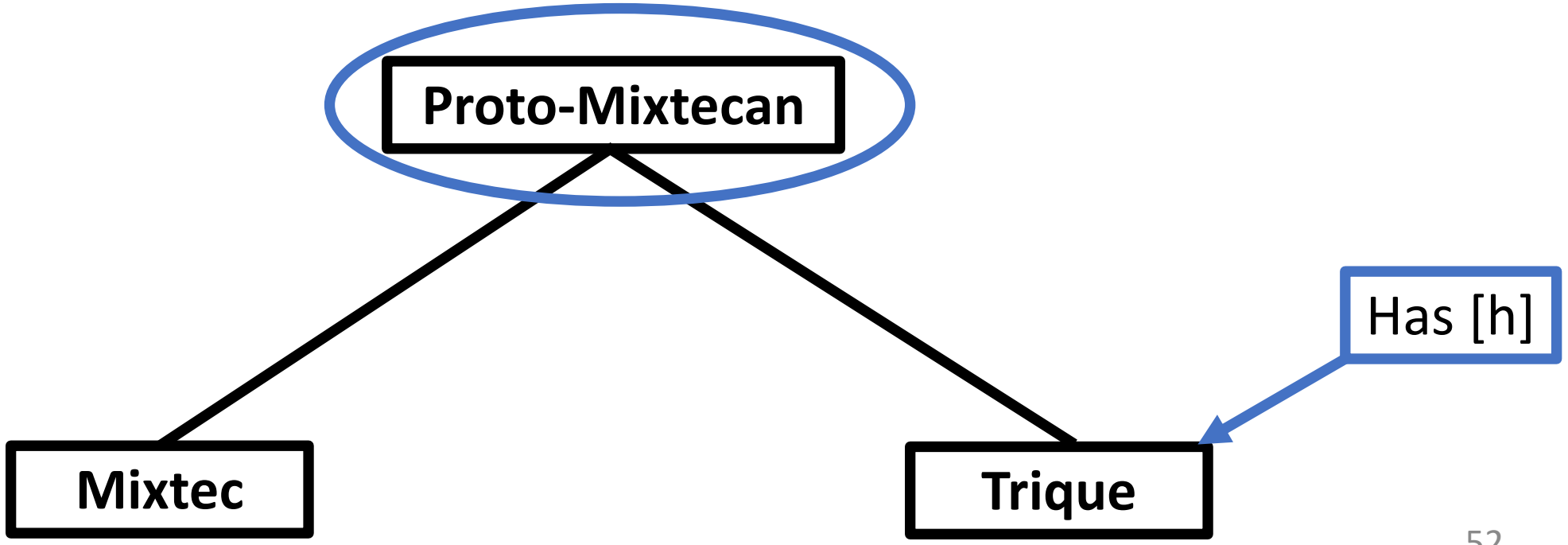
There are two logically possible explanations for the distribution of [h] in SMP Mixtec, and its absence in other varieties:

Hypothesis 1	**Hypothesis 2**
SMP Mixtec innovated [h] in particular tonal melodies	SMP Mixtec exceptionally retained Proto-Mixtecan *[h]

Comparative evidence

We can test these hypotheses by looking at cognate sets

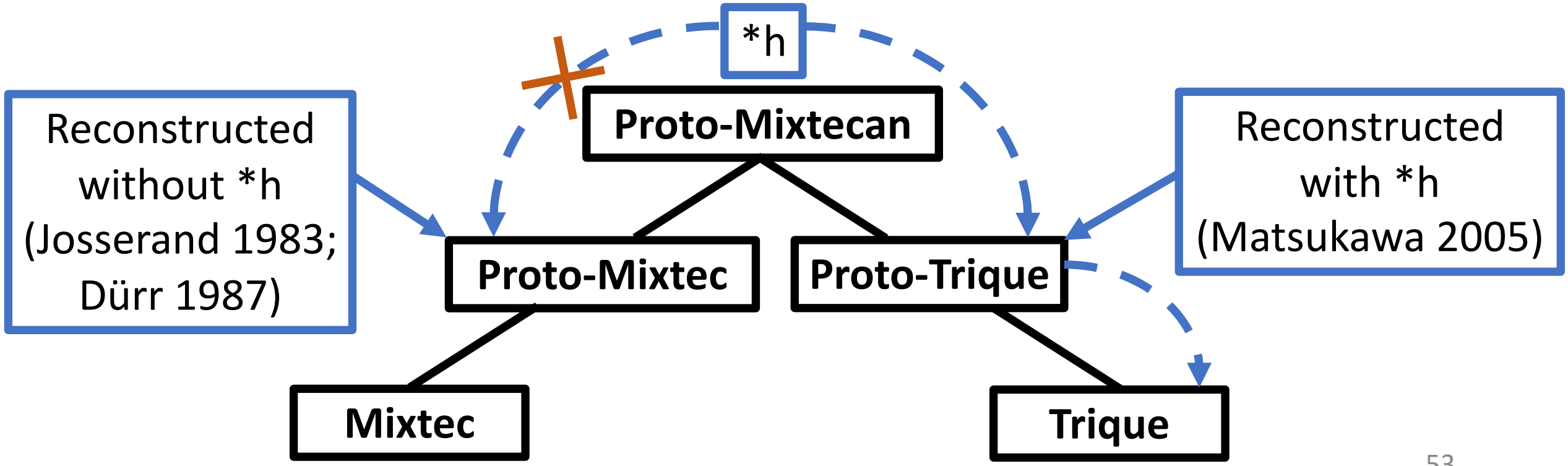
- Trique varieties have [h] (e.g., DiCanio 2008)
- Mixtec and Trique have a common ancestor: Proto-Mixtecan



Comparative evidence

Simplified genealogical relationship (excluding Cuicatec)

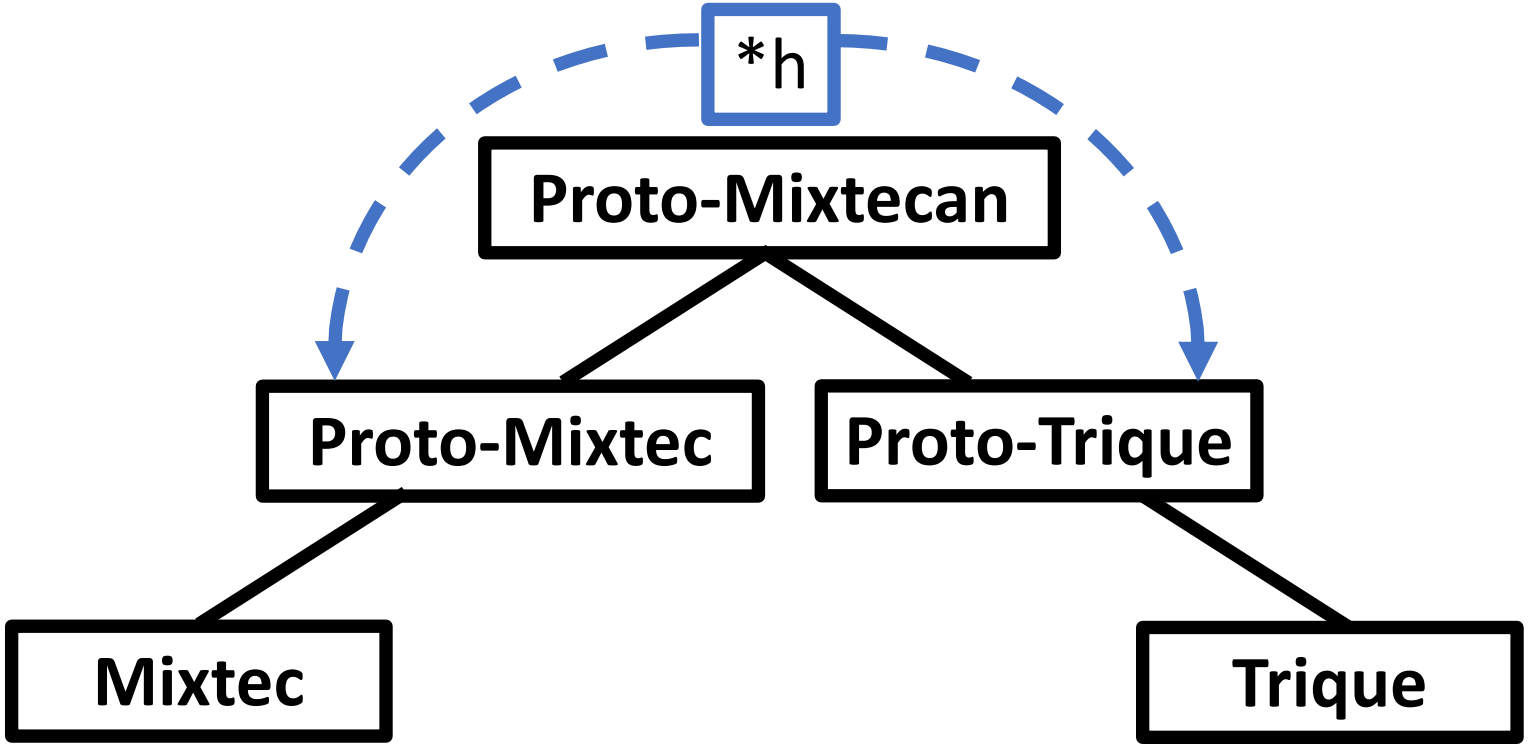
- Proto-Mixtecan split into Proto-Mixtec and Proto-Trique



Comparative evidence

But perhaps SMP Mixtec actually retains a potential Proto-Mixtecan *h

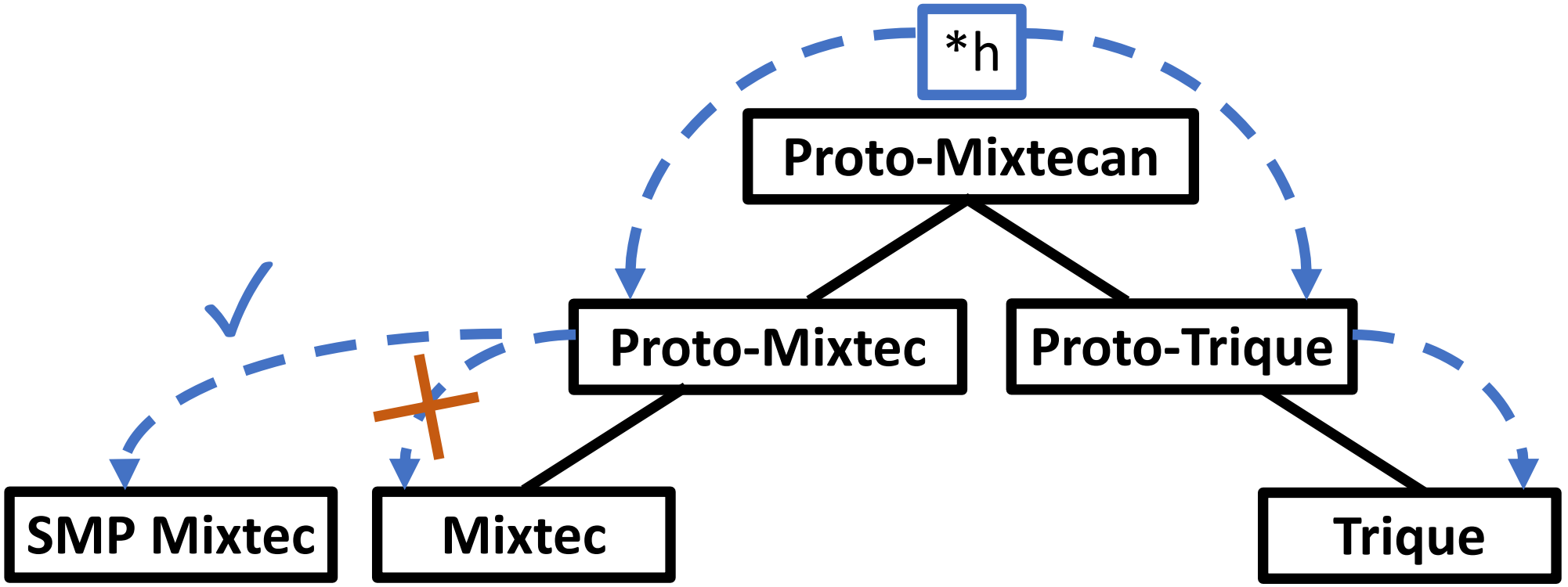
- Passed down to Proto-Mixtec and Proto-Trique



Comparative evidence

But perhaps SMP Mixtec actually retains a potential Proto-Mixtecan *h

- Then lost in all Mixtec varieties but SMP Mixtec, maintained in Trique



Comparative evidence

If this is the accurate, we expect **systematic correspondence** w.r.t. [h] between SMP Mixtec and cognates in Trique

We gathered Trique cognates from Auderset and Campbell's (2023) database and compared them with SMP Mixtec words in our database

- There is **no systematic correspondence** between [h] in SMP Mixtec words and cognates in Trique varieties

Comparative evidence

While some SMP Mixtec words with [h] have Trique cognates with [h]…

	SMP Mixtec	**Chicahuaxtla Trique**
‘egg’	[$\widehat{{}^{n}ts}i^{h}\beta\check{i}$]	[$\widehat{t\S}uh^{3}$]
‘ash’	[$ja^{h}\check{a}$]	[jːah^{3}]
‘thorn’	[$\bar{\imath}^{h}\jmath\check{u}\tilde{\check{}}$]	[tãh^{32}]

Comparative evidence

Many SMP Mixtec words with [h] do have a Trique cognate **without** [h]

	SMP Mixtec	**Chicahuaxtla Trique**
‘tongue’	[jâʰă]	[ja^{32}]
‘sugarcane’	[ⁿtòʰǒ]	[jo^{32}]
‘man’	[t͡sʲàʰa]	[si^{35}]
‘soap’	[nə̀ʰmə̌]	[mːiʔ^{3}]
‘day’	[kìʰĭ]	[gʷi^{3}]

Comparative evidence

And many SMP Mixtec words **without** [h] have Trique cognates **with** [h]

	SMP Mixtec	**Chicahuaxtla Trique**
‘clothes’	[t͡sʲàà]	[ja͡tseh^{5}]
‘yellow’	[kʷáa̋à̋]	[majah^{32}]
‘chile pepper’	[jaʾă]	[jaʔ^{3}ah^{3}]
‘dream’	[ʃànĭ̀]	[neh^{32}]
‘five’	[ů̀ʾů]	[ũʔ^{2}ũh^{3}]

Comparative evidence

This non-systematic correspondence holds for cognates in Copala, Chicahuaxtla, and Itunyoso Trique

- Whether the SMP Mixtec word has [h] is not predictive of whether the Trique cognate does
- Not expected if SMP Mixtec [h] and Trique [h] came from the same *h

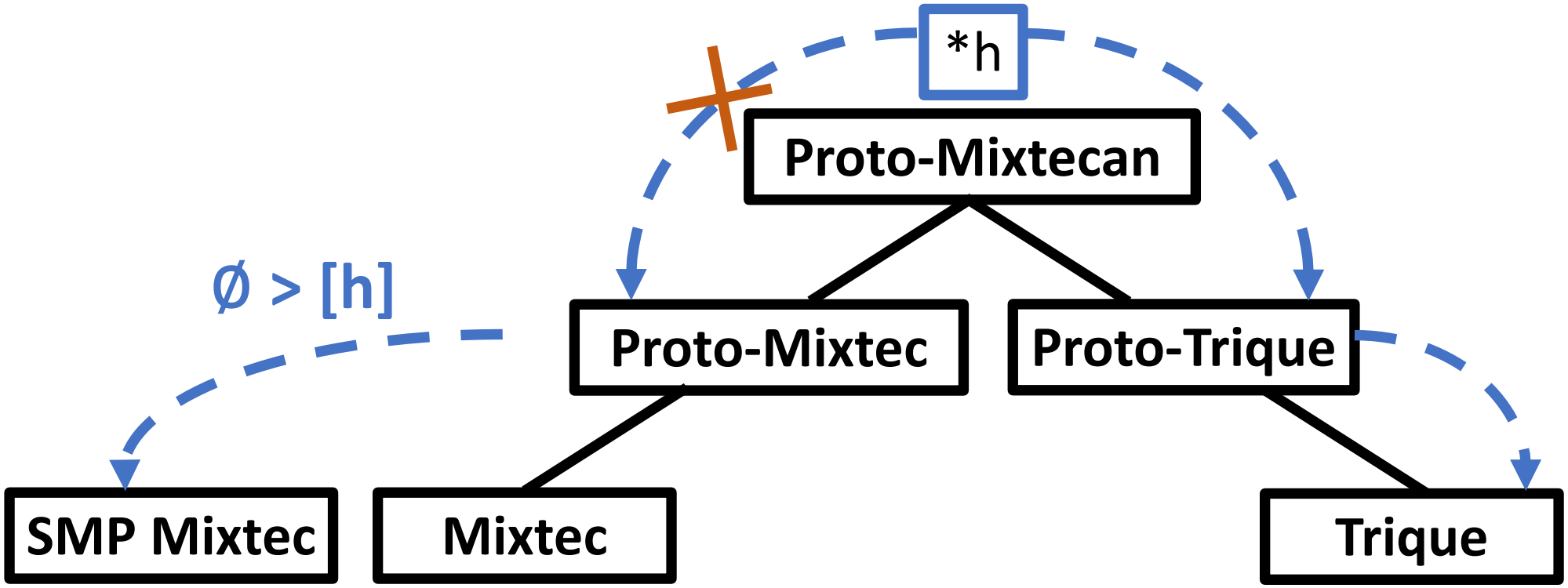
Comparative evidence

Generalization: There is **no systematic relationship** between [h] in SMP Mixtec and [h] Trique

- It is unlikely that SMP Mixtec retains Proto-Mixtecan *[h].
- Instead, any Proto-Mixtecan *h would have been lost before innovation in SMP Mixtec

Comparative evidence

More likely that *h lost in Proto-Mixtec, then innovated in SMP Mixtec



Comparative evidence

The comparative evidence then supports Hypothesis 1, and goes against Hypothesis 2

Hypothesis 1	**Hypothesis 2**
SMP Mixtec innovated [h] in particular tonal melodies	SMP Mixtec exceptionally retained Proto-Mixtecan *[h]

Summary and conclusion

Summary and conclusion

What we've seen so far…

1. Words with [h] and CV(D)V roots are in tonal complementary distribution in SMP Mixtec
2. Cognates in other Mixtec varieties are all CV(D)V roots
3. There is no systematic correspondence between [h] in SMP Mixtec and Trique

Summary and conclusion

Claim: [h] in SMP Mixtec was innovated on roots with a Low-then-higher tonal melody

Tonally-conditioned laryngogenesis in SMP Mixtec
*t͡sʲàa > t͡sʲàʰa ‘man’

The innovation of [h] may have served to accentuate a low pitch trough under coarticulatory pressure of a following higher tone

Summary and conclusion

Tonally-conditioned laryngogenesis is extremely rare, attested only in one other language (Quiaviní Zapotec, Uchihara 2016)

Conclusion

Remaining question: Why did TCL occur in SMP Mixtec and Quiaviní Zapotec, but apparently not in other languages?

Rarity

- May have to do with asymmetric dependencies in the perception of pitch and phonation (Yang 2019)

Why these languages?

- Perhaps not a coincidence that both languages already had a relatively cross-classified system of tone and phonation

Summary and discussion

Quiaviní Zapotec:

- Four tone categories (Munro and Lopez 1999; Chavez Peón 2010; Uchihara 2016)

Phonation	Realization	Tones
Modal (*V*)	[āà]	Low
	[áā]	High
	[áà]	Falling
	[āá]	Rising
Creaky (*V̰*)	[ā̰ʔ] /_T$_{[fortis]}$ [ā̰à̰ʔ] /_# [ā̰] /_T$_{[lenis]}$, _R	Low
	[á̰ʔ] /_T$_{[fortis]}$ [á̰ʔ] /_# [á̰] /_T$_{[lenis]}$, _R	High
	[á̰à̰]	Falling
Interrupted (*V'V*)	[āʔà], [à̰ʔ^{a}]	Low
	[áʔ^{a}]	High
	[áʔà]	Falling

From Uchihara (2016:228)

Summary and discussion

Quiaviní Zapotec:

- Four tone categories (Munro and Lopez 1999; Chavez Peón 2010; Uchihara 2016)
- Three contrast on creaky vowels

Phonation	Realization	Tones
Modal (*V*)	[āà]	Low
	[áā]	High
	[áà]	Falling
	[āá]	Rising
Creaky (*V̰*)	[ā̰ʔ] /_T[fortis] [ā̰à̰ˀ] /_# [ā̰] /_T[lenis], _R	Low
	[á̰ʔ] /_T[fortis] [á̰ˀ] /_# [á̰] /_T[lenis], _R	High
	[áà̰]	Falling
Interrupted (*V'V*)	[āʔà], [à̰ʔᵃ]	Low
	[áʔᵃ]	High
	[áʔà]	Falling

From Uchihara (2016:228)

Summary and discussion

Quiaviní Zapotec:

- Four tone categories (Munro and Lopez 1999; Chavez Peón 2010; Uchihara 2016)
- Three contrast on creaky vowels
- Three contrast on interrupted vowels

Phonation	Realization	Tones
Modal (*V*)	[āà]	Low
	[áā]	High
	[áà]	Falling
	[āá]	Rising
Creaky (*V̰*)	[ā̰ʔ] /_T[fortis] [ā̰à̰ʔ] /_# [ā̰] /_T[lenis], _R	Low
	[á̰ʔ] /_T[fortis] [á̰ʔ] /_# [á̰] /_T[lenis], _R	High
	[á̰à̰]	Falling
Interrupted (*V'V*)	[ā̰ʔà], [à̰ʔᵃ]	Low
	[á̰ʔᵃ]	High
	[á̰ʔà]	Falling

From Uchihara (2016:228)

Conclusion

SMP Mixtec also contrasts many tones on vowels followed by [ʔ]

- These can be analyzed as non-modal vowels (Eischens and Hedding to appear, cf. Peters 2018)

H-L	**M-L**	**L-L**	**LH-L**	**HL-L**
Xá’nù [ʃáˀnṹ] ‘old’ ‘viejo/grande’	Sa’và [saˀβà] ‘frog’ ‘Rana’	Ì’vì [ìˀβì] ‘pain’ ‘dolor’	Mă’na [mằˀnà̃] ‘sleepless’ ‘desvelado’	??

Conclusion

It is possible that **laryngeal complexity,** the orthogonality of tone and phonation contrasts in a language (Silverman 1997), increases the likelihood of TCL

If this is the case, the rarity of TCL may have another explanation:

- Laryngeal complexity is relatively rare typologically
- If it is a precursor to TCL, this means TCL will be even more rare

Thank you!

Appendix A: Comparative evidence

This non-systematic correspondence holds for cognates in three Trique varieties

- In the cognate set, the total percentage of Trique words with [h] is 30-40%

	Chicahuaxtla	**Copala**	**Itunyoso**
Trique words with [h]	25	20	31

Percentage of Trique words with [h] in the entire cognate set

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Trique words with [h]	25	20	31
Trique words without [h]	60	46	53

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	Chicahuaxtla	**Copala**	**Itunyoso**
Trique words with [h]	25	20	31
Trique words without [h]	60	46	53
Trique words with [h] / all Mixtec cognates (with or without [h])	25/85 (29%)	20/66 (30%)	31/84 (37%)

Percentage of Trique words with [h] in the entire cognate set

Appendix A: Comparative evidence

	Chicahuaxtla	**Copala**	**Itunyoso**
Mixtec word has [h], and Trique cognate has [h]	7	7	9

Percentage of Trique words with [h], limited to cognates of SMP Mixtec words with [h]

Appendix A: Comparative evidence

	Chicahuaxtla	**Copala**	**Itunyoso**
Mixtec word has [h], and Trique cognate has [h]	7	7	9
Mixtec word has [h], but Trique cognate doesn't have [h]	15	12	13

Percentage of Trique words with [h], limited to cognates of SMP Mixtec words with [h]

Appendix A: Comparative evidence

	Chicahuaxtla	**Copala**	**Itunyoso**
Mixtec word has [h], and Trique cognate has [h]	7	7	9
Mixtec word has [h], but Trique cognate doesn't have [h]	15	12	13
Trique cognates with [h] / all Mixtec cognates with [h]	7/22 (31%)	7/19 (37%)	9/22 (41%)

Percentage of Trique words with [h], limited to cognates of SMP Mixtec words with [h]

Appendix A: Comparative evidence

When the cognate set is subsetted to words that have [h] in SMP Mixtec, the same percentage of Trique cognates has [h]: 30-40%

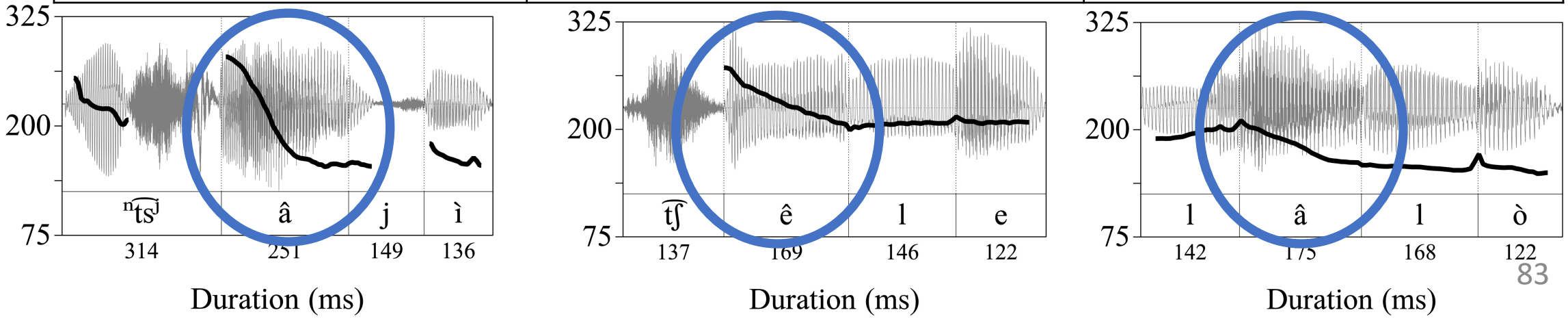
	Chicahuaxtla	**Copala**	**Itunyoso**
Mixtec word has [h], and Trique cognate has [h]	7	7	9
Mixtec word has [h], but Trique cognate doesn't have [h]	15	12	13
Trique cognates with [h] / all Mixtec cognates with [h]	7/22 (31%)	7/19 (37%)	9/22 (41%)

Percentage of Trique words with [h], limited to cognates of SMP Mixtec words with [h]

Appendix B: Falling tones

Three falling tones:

HL-L	HM-M	ML-L
Ntsiâyì [ⁿt͡sʲâjì] ‘Tremuloso’ ‘Tremuloso’	Chêle [t͡ʃ̄ele] ‘Gallo’ ‘Rooster’	Lâlò [lā̀lò] ‘Crujiente’ ‘Crunchy’



Appendix B: Falling tones

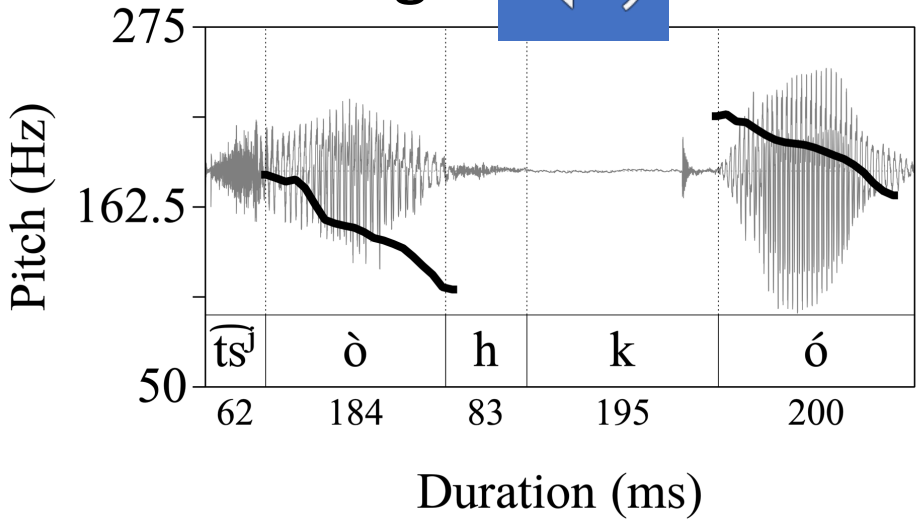
The difference between level and falling tones is at least marginally contrastive:

Level tone	**Falling tone**
Konì [konǐ̀] ‘will see’ ‘Verá’	Konì [kṑnǐ̀] ‘will want’ ‘Querrá’
Nánà [nā́nǎ̀] ‘mother’ ‘madre’	Xânù [ʃầnǔ̀] ’cigarette’ ‘cigarillo’

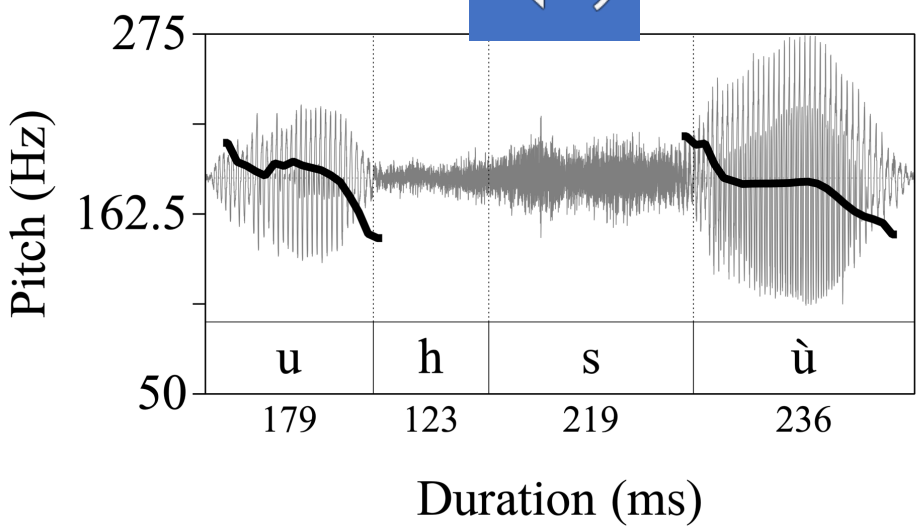
Appendix C: Predictable [h]

Root-medial voiceless consonants are predictably preceded by [h], may be preaspiration (Eischens and Hedding to appear)

1. Tsiòkó
   [t͡sʲòʰkó]
   ‘Ant’
   ‘Hormiga’



2. Usù
   [uʰsù]
   ‘Deer’
   ‘Venado’



Appendix C: Predictable [h]

Tone is not restricted on roots with predictable [h]

Tone of mora 1 \ Tone of mora 2	H	M	L	LH
H	✓	✓	✓	✓
M	✓	✓	✓	✓
L	✓	✓	✓	✓
LH	✓	✓	✓	✗
HL	✗	✗	✓	?
ML	✗	✗	✓	✓

Table:
Attested tonal melodies on roots with predictable [h]

Appendix C: Predictable [h]

Preaspiration of root-medial voiced consonants also occurs in several related Mixtec varieties

- Alcozauca de Guerrero (Mendoza Ruiz 2016)
- Ayutla (Pancratz and Pike 1967)
- San Juan Piñas (Caballero et al to appear)

Not a tonally-induced innovation

Appendix C: Predictable [h]

Words with predictable [h] provide more evidence for non-correspondence between SMP Mixtec 'contrastive' [h] and Trique [h].

- These words don't have 'contrastive' [h], but their Trique cognates do.

	SMP Mixtec	**Chicahuaxtla Trique**
'cold'	[βìʰʃĩ]	[nuwih^{3}]
'cooking pot'	[kìʰsi]	[ruh^{3}]
'toad'	[síʰkʷi]	[ʃi^{2} + ɾi^{3}kɨh^{3}]
'fish'	[t͡sʲàʰká]	[ʃu^{3} + kʷah^{32}]

Appendix C: Predictable [h]

And many SMP Mixtec words **without** [h] have Trique cognates **with** [h]

	SMP Mixtec	**Chicahuaxtla Trique**
‘clothes’	[t͡sʲàà]	[ja͡tseh^{5}]
‘yellow’	[kʷa̋a̋à]	[majah^{32}]
‘chile pepper’	[jaʾă]	[jaʔ^{3}ah^{3}]
‘dream’	[ʃànĭ]	[neh^{32}]
‘five’	[ŭʾŭ]	[ũʔ^{2}ũh^{3}]

Appendix D: L-H roots

CV(D)V roots with L-H melodies are vanishingly rare, and their L-H melodies have alternative explanations

- We know of 8 CV(D)V roots with this melody

2/8 are vocatives ([nɑ̃ɑ̃́], ‘ma’am’; [tàá], ‘sir’)

1/8 involves LH negative grammatical tone ([kòó], ‘empty/has nothing’)

2/8 are historically bimorphemic ([tòɲű], ‘thorn tree’; [tsɨ̃ĭi] ‘mouse’)

Appendix D: L-H roots

CV(D)V roots with L-H melodies are vanishingly rare, and their L-H melodies have alternative explanations

- We know of 8 CV(D)V roots with this melody

1/8 is produced with [h] by some speakers ([tũ̱ʉ̃] ~ [tũ̱ʰʉ̃], ‘charcoal’)

1/8 has irregular melodies in other varieties ([ʃàá], ‘new’)

Only 1/8 is without explanation ([nũ̱ʉ̃], ‘first’)

Appendix E: Independence of [h] and tone

While *roots* with [h] have restricted tonal melodies, [h] can still occur with other tonal melodies.

Lexical tones	**Derived tones**
Tàjan [tɜ̀ʰɜ̃] ‘will quake’ ‘temblará’	Tájan [tɜ́ʰɜ̃] ‘earthquake’ ‘temblor’
Yâjă [jâʰă] ‘tongue’ ‘lengua’	Yâjă ì [jáʰ=î] ‘my tongue’ ‘mi lengua’

Appendix E: Independence of [h] and tone

And CV(D)V melodies without [h] don't get it when their melody becomes one of the four in which [h] occurs

Lexical tones	**Derived tones**
Kani [kanĩ] 'will hit' 'pegará'	Kàni [kànĩ] 'hit (past)' 'pegó'
Xânù [ʃânů] 'cigarette' 'cigarillo'	Xânù ún [ʃânn=ŭ] 'your cigarette' 'tu cigarillo'