Phonetics of glottalized phonations in Yateé Zapotec

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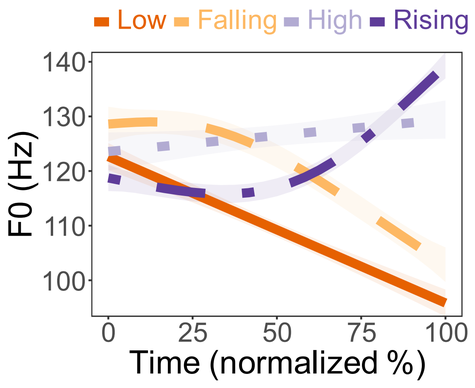
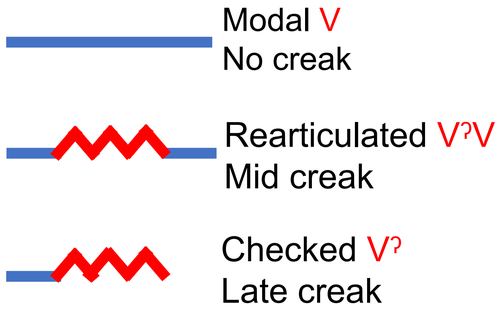
Introduction

- **Yateé Zapotec (YZ)** [1,2]**:**
  - Otomanguean:Northern Core Zapotec
  - Spoken in San Francisco Yateé, Oaxaca, Mexico (~150 speakers), and in Los Angeles, US by diaspora community.

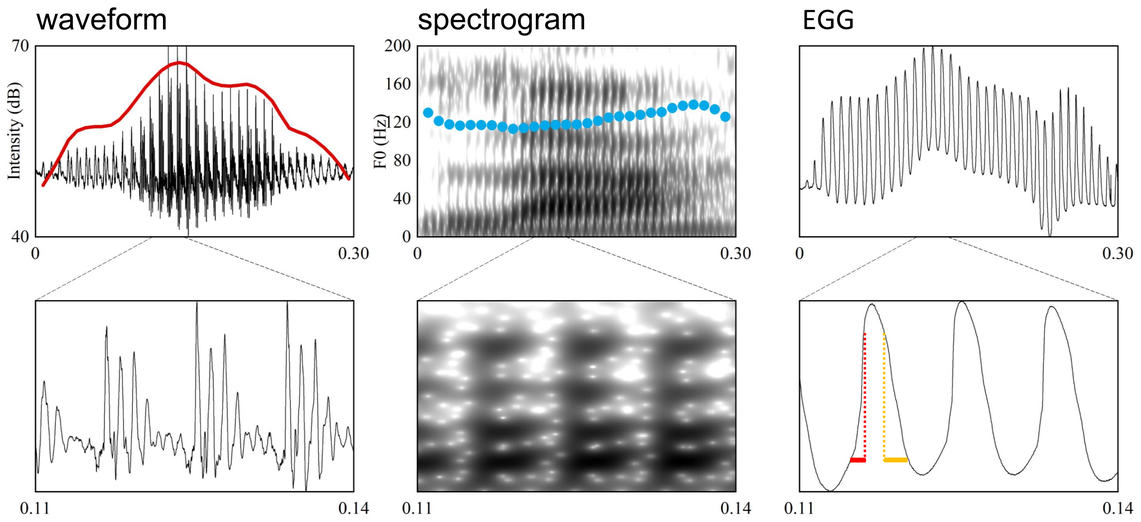
- **Four tones:**
  - Low (V̀), High (V́), Rising (V̌), Falling (V̂)
- **Three phonations:**
  - Modal V, Rearticulated VʔV, Checked Vʔ





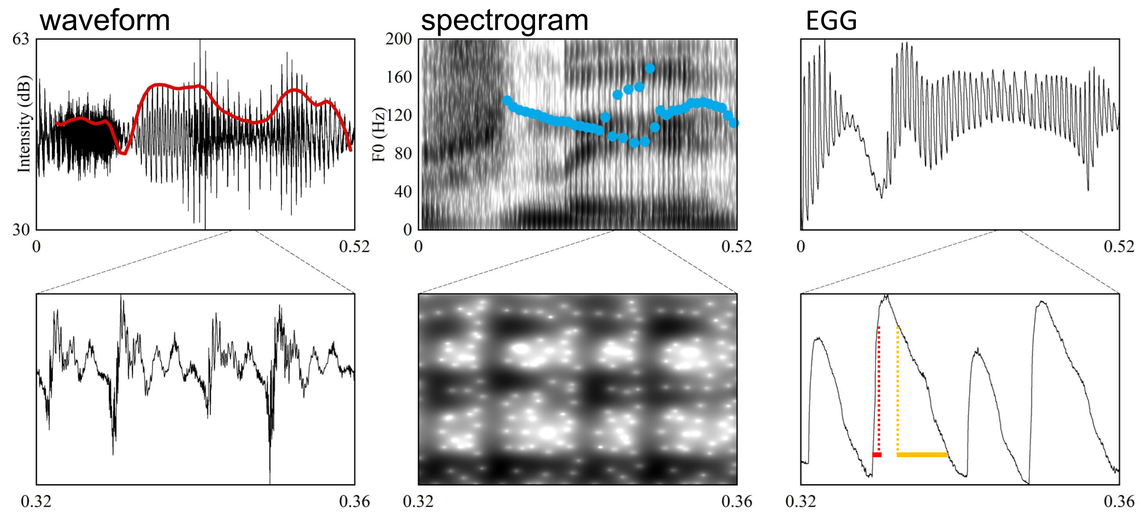
Examples

Modal /lːá/ “hot”



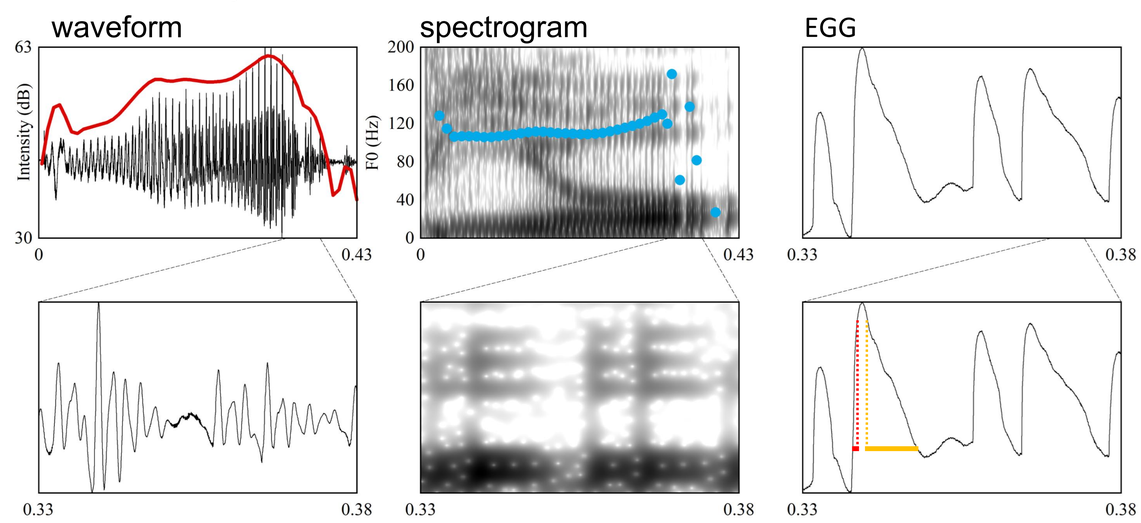
Contacting phase	/	Decontacting phase	=	Skew quotient
1.56		3.17		0.49

Rearticulated /ʂnèʔé/ “my mother”



Contacting phase	/	Decontacting phase	=	Skew quotient
0.54		5.12		0.11

Checked /bjŏʔ/ “moon”



Contacting phase	/	Decontacting phase	=	Skew quotient
0.52		8.25		0.06

Methods

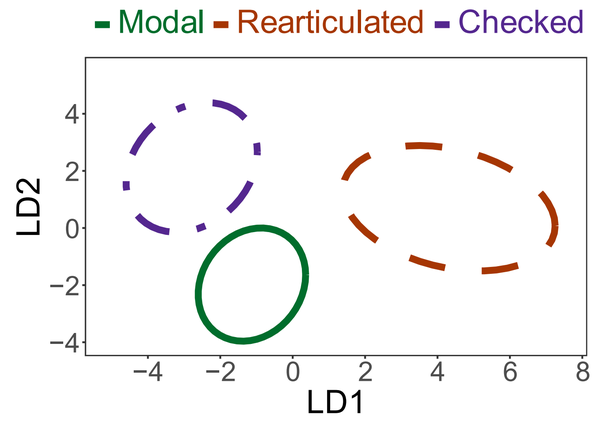
- **Questions:** What **acoustic** and **articulatory** parameters most effectively differentiate the three **phonations** in YZ? How does **tone** affect the phonetics of the three **phonations**?
- **Stimuli:** Monosyllables in isolation and utterance-initial, medial, and final positions.

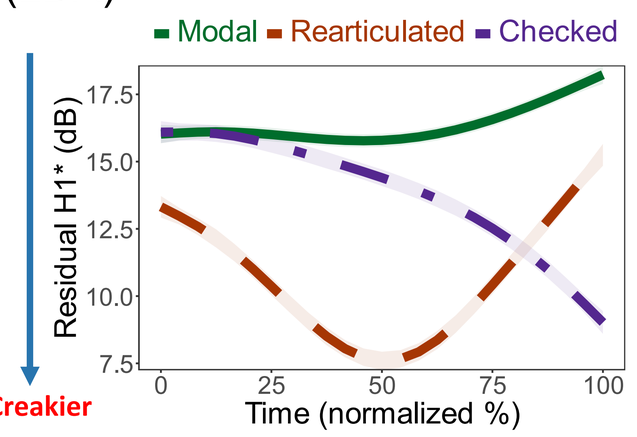
TARGET nːàʒó SPANISH ʂtiʒato.	**«jîʔ»** is the word for “fuego” in our language.
wsêdla lːé nːàké nːàʒóʔ **TARGET** díʒà tʂètóʔ	Let me teach you what is **TARGET** in our language.
nːa nːàʒó **TARGET**.	The next word is **TARGET**.

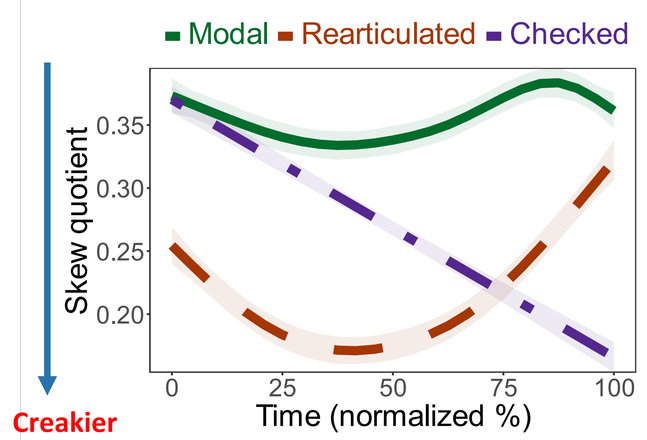
- 350 tokens (50 words * 7 rep) in total
- Current data based on one 37-year-old male speaker
- Collected audio and electroglottography (EGG) data

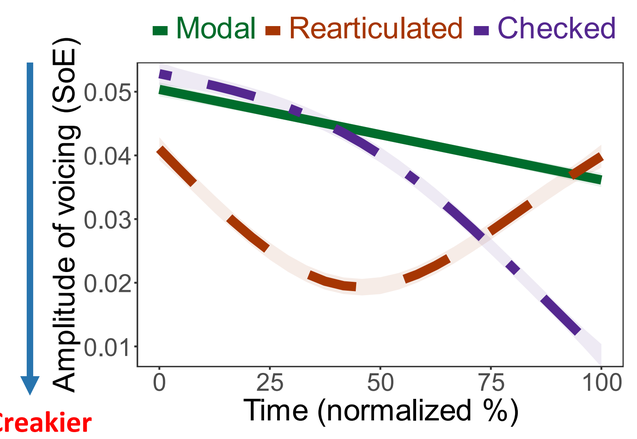
Results: Phonation

- **Parameters:** F0, Residual H1* [3], H1*–H2* [4], H2*–H4* [5,6], H4*–H2K*, H2K*–H5K* [6], CPP, HNR (< 500 Hz), SHR [7], Contact quotient (CQ) [8], Skew quotient [9], Energy, Amplitude of voicing (Strength of Excitation, SoE) [7], Duration
- **Test:** Linear discriminant analysis (LDA)



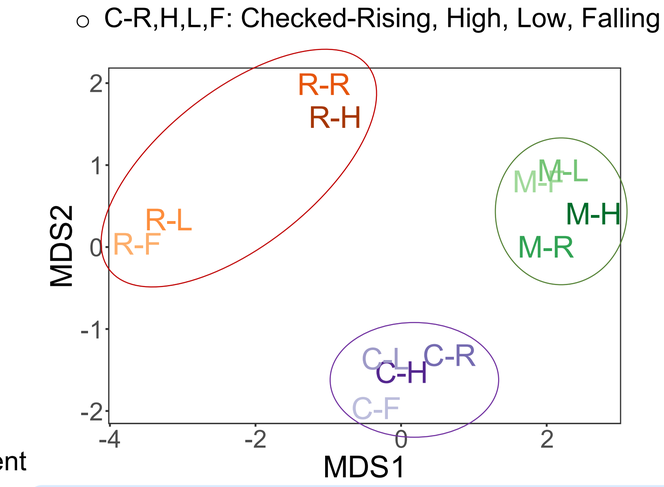


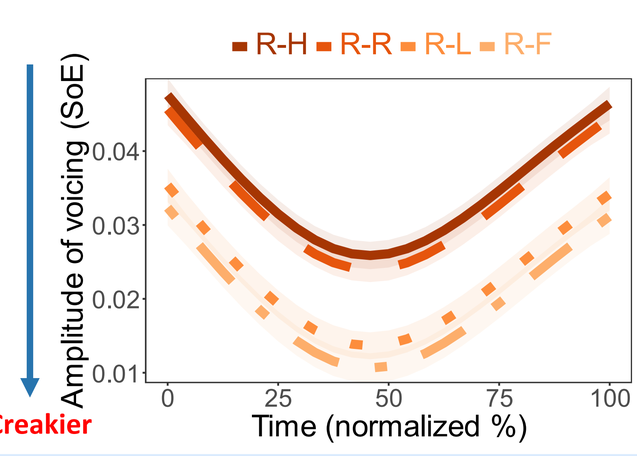




Results: Phonation * Tone

- **Parameters:** F0, Residual H1*, H1*–H2*, CPP, SHR, CQ, Skew quotient, Energy, SoE, Duration
- **Test:** Multidimensional scaling (MDS)
  - R-R,H,L,F: Rearticulated-Rising, High, Low, Falling
  - M-R,H,L,F: Modal-Rising, High, Low, Falling
  - C-R,H,L,F: Checked-Rising, High, Low, Falling





Conclusion

- **Checked** phonation is distinguished from other phonations by **vowel-final glottalization**.
- **Rearticulated** phonation is distinguished from the other phonations by **vowel-medial glottalization**.
- **Tone** interact with the acoustics of **rearticulated** phonation: rearticulated vowels with a **rising** or **high** tone are less glottalized than those with a **falling** or **low** tone.

References & Acknowledgements

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