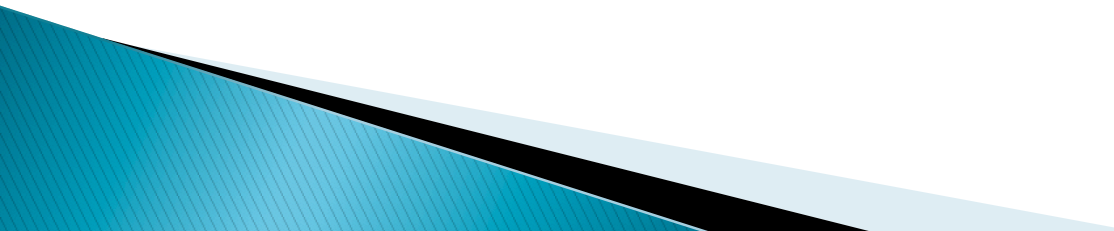


# Onset-Sensitive Stress in Ngigua

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# Introduction

- ▶ Ngigua is a native Mexican language, described in Stark & Machin (1977), a discussion of the stress and tone system
  - ▶ I conducted elicitation sessions with Sra. Teresa Damian Jara, a native speaker of Ngigua to determine whether Stark & Machin's descriptions are accurate
  - ▶ I provide a theoretical description of stress in Ngigua based on the results of my elicitation
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# Ngigua

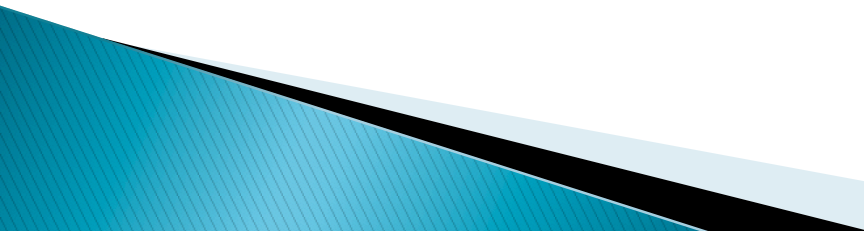
- ▶ Spoken in San Marcos Tlacoyalco, Puebla, Mexico (population ~18,000)
- ▶ Otomanguean family, Popolocan branch
- ▶ Described most thoroughly in Stark (1976), Stark & Machin (1977), and Stark & Villanueva (2011)
- ▶ Ngigua is VSO, has 3 tones, lexical stress, and forbids codas



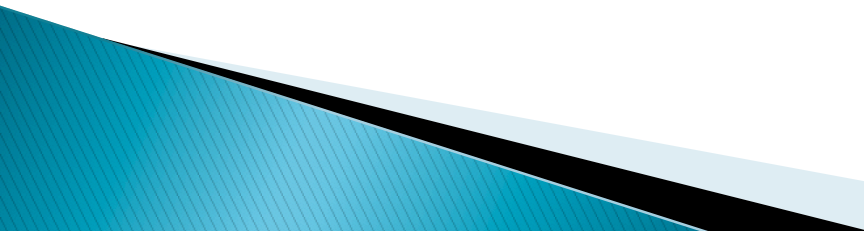
# Stress in Ngigua

- ▶ As described in Stark & Machin (1977), Ngigua has two different types of stress:
  - ‘Vowel-based’ stress: 'CV:.CV, CV.'CV:
  - ‘Consonant-based’ stress: CV.'C:V
- ▶ These two types of stress appear in near minimal pairs
  - [sa<sup>2</sup>'k:o<sup>3</sup>] ‘pineapple’ *sako*
  - ['sa:<sup>12</sup>ko<sup>2</sup>] ‘jacket’ *saako*
  - ['ʃ:ã<sup>3</sup>] ‘hair’ *xran*\*
  - ['ʃã:<sup>12</sup>] ‘your work’ *xraan*\*

# Stress in Ngigua

- ▶ The stress system of Ngigua appears to involve onset dependent stress, which is typologically rare (Davis 1988)
  - ▶ Onset segments have been claimed to influence weight in Pirahã (Everett & Everett 1984) and Western Aranda (Strehlow 1944)
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# Speaker Consultation

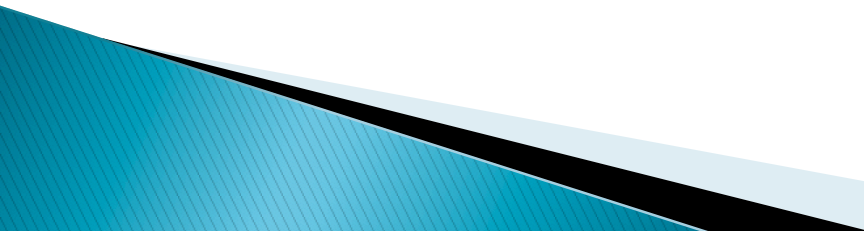
- ▶ Elicitation was conducted in Spanish with the help of a translator
  - ▶ We began with questions about stress position in common Spanish words (niño, rapido, rápidamente, etc.)
  - ▶ This was followed by an elicitation session was designed to elicit stress intuitions about Ngigua words of both stress types
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# Stress Elicitation

- ▶ Elicited stress-based minimal pairs and words with stress-shifting suffixes
- ▶ Target words were elicited in the frame “She said ‘it is (a) \_\_\_\_\_.’”

	no suffix	- <i>na</i> ‘my’	- <i>chjan</i> ‘small’
1) ‘tomato’	[ʃo <sup>3</sup> t:i <sup>1</sup> ] <i>xuthi</i>	[ʃo <sup>3</sup> ti <sup>1</sup> n:a <sup>3</sup> ] <i>xuthina</i>	[ʃo <sup>3</sup> ti <sup>1</sup> tʃ:ã <sup>3</sup> ] <i>xuthichjan</i>
2) ‘pineapple’	[sa <sup>2</sup> k:o <sup>3</sup> ] <i>sako</i>	[sa <sup>2</sup> ko <sup>3</sup> n:a <sup>3</sup> ] <i>sakona</i>	[sa <sup>2</sup> ko <sup>3</sup> tʃ:ã <sup>3</sup> ] <i>sakochjan</i>
3) ‘jacket’	[ <sup>1</sup> sa: <sup>12</sup> ko <sup>2</sup> ] <i>saako</i>	[sa <sup>1</sup> ko <sup>2</sup> n:a <sup>3</sup> ] <i>saakona</i> *	[sa <sup>1</sup> ko <sup>2</sup> tʃ:ã <sup>3</sup> ] <i>saakochjan</i> *
4) ‘skirt’	[ <sup>1</sup> nã: <sup>12</sup> goa <sup>2</sup> ] <i>naagua</i>	[nã <sup>12</sup> goa <sup>2</sup> n:a <sup>3</sup> ] <i>naguana</i> *	[nã <sup>21</sup> goa: <sup>12</sup> ] <i>naguaa</i>

# Stress Elicitation

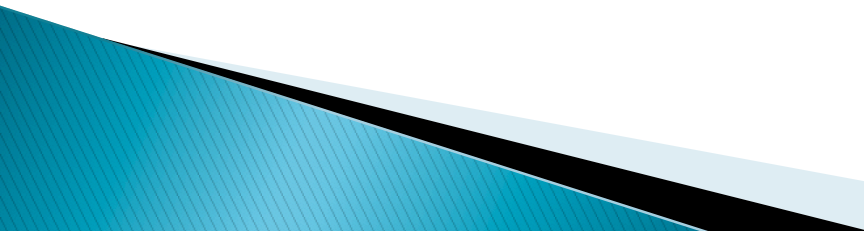
- ▶ Teresa's overall confidence in the task was very low, and her responses were complicated by multiple factors.
    - Her understanding of 'accent' versus length in Ngigua was unclear
  - ▶ There may have been a confound between 'acento' for stress, and 'acento' for the accent mark in Spanish
  - ▶ Importantly, consultation with Teresa did demonstrate that geminate consonants syllabify with the following vowel
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# Song Elicitation

- ▶ Songs or chants often match lexical stress with rhythm (Hayes & Kaun 1996, Fitzgerald 1997)
- ▶ When asked, Teresa volunteered a song that is often sung with children in pre-school to teach body parts
- ▶ She sang while tapping on the table to the beat
- ▶ Praat analysis showed that her taps matched up with the onset of syllables which Stark & Machin (1977) describe as stressed:
  - [mã<sup>2</sup>'k:õ<sup>2</sup>] 'his eye' *makon*
  - [tʃĩ<sup>3</sup>'th:õ<sup>2</sup>] 'his nose' *chjinthon*

# Results of Speaker Consultation

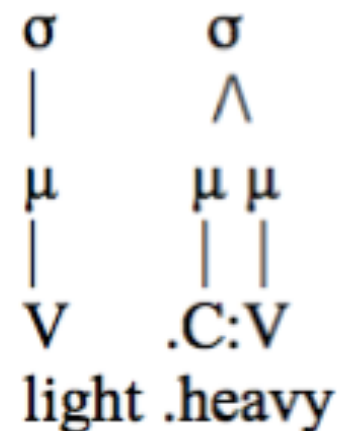
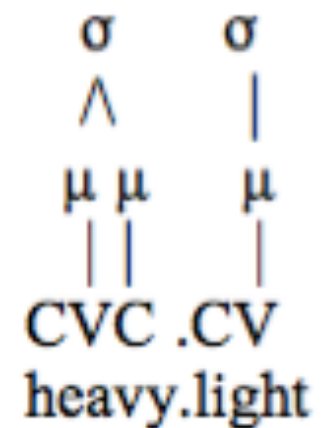
- ▶ Perceptually-based lexical stress discrimination in the language is not as clean cut as could be hoped for.
  - ▶ Analysis of singer-provided rhythm in an Ngigua song did indicate that lexical stress can fall on both CV: penultimate and C:V final syllables as described by Stark & Machin (1977)
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# Traditional Stress Analysis

- ▶ Hayes (1995) describes stress as fundamentally based on syllable quality or prominence
  - Heavy syllables: long vowel (CVV), coda consonant (CVC), or both (CVVC)
  - Light syllables: any syllable which does not qualify as heavy
- ▶ Onset segments contribute nothing to syllable weight
  - “VC is prosodically equivalent to CVC and CCVC, V: to CV: and CCV:, and so on.” (Hayes 1995)

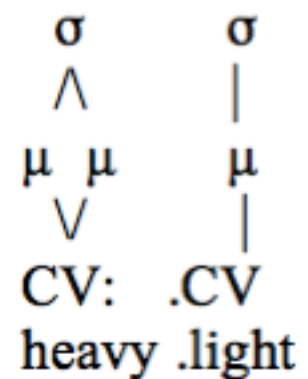
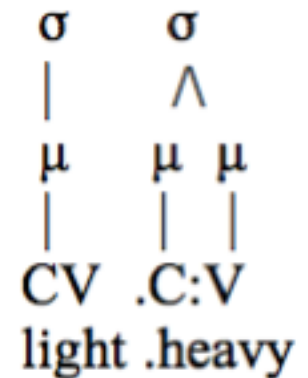
# Modified Stress Analysis

- ▶ Topintzi (2010) expands Hayes (1995), to propose that geminate consonant onsets can contribute to moraic stress.
- ▶ Geminate consonants have been traditionally analyzed as ambisyllabic
- ▶ In Topintzi's analysis, onset geminate consonants can contribute a mora to a syllable
- ▶ C:V syllables are counted as bimoraic, and therefore heavy



# Discussion

- ▶ Vowel length is unpredictable, indicating that Ngigua possesses an underlying phonemic vowel length distinction.
  - *saako* ‘jacket’ and *sako* ‘pineapple’
- ▶ Underlying long vowels surface to create bimoraic heavy syllables
  - These receive stress, according to the Weight-to-Stress Principle (WSP)
- ▶ Underlying short vowels cannot satisfy Ngigua’s heavy syllable requirement
  - The consonant onset of the word’s final syllable geminates, contributing a mora to the final C:V syllable, which then attracts stress.
- ▶ /ko<sup>2</sup>tʃe:<sup>3</sup>/ → [ko<sup>2</sup>tʃe:<sup>3</sup>] ‘fish’ *kuchee*
- ▶ /ko<sup>2</sup>tʃe<sup>2</sup>/ → [ko<sup>2</sup>tʃ:<sup>2</sup>e<sup>2</sup>] ‘louse’ *kuche*



# Conclusions

- ▶ Evidence for moraicity of long C onsets:
  - Speaker intuitions indicate inclusion of entire geminate in syllable onset
  - Ngigua forbids codas elsewhere
  - Mono-syllabic words can begin with a long consonant
    - [ʃ:ã<sup>3</sup>] ‘hair’ *xran*\*
    - [ʃã:<sup>12</sup>] ‘your work’ *xraan*\*
  - If geminate consonants were ambisyllabic, Ngigua would then regularly feature stress on a light CV syllable following a heavy CVC syllable
    - *xuthi* ‘tomato’ would be analyzed as [fo<sup>3</sup>t.<sup>1</sup>ti<sup>1</sup>]

# Future Research

- ▶ Speaker consultation is only one method of attempting to understand stress in Ngigua
- ▶ We still don't know what the phonetic correlates of stress are
- ▶ Preliminary phonetic analysis indicates that duration and intensity play a role, but data from more speakers is needed to confirm
- ▶ My data was too limited to investigate how the other remarkable structural properties of Ngigua interact with stress
  - System of resumptive pronouns

A group of children in a classroom are sitting on the floor, engaged in a learning activity. They are wearing dark blue and light blue jackets. The children are surrounded by various educational materials, including cards with text and images, and containers like a white bucket and a clear plastic jar. The background shows a typical classroom setting with tables and chairs.

# Thank you!

- ▶ Special thanks to Teresa Damian Jara for her incredible generosity in sharing her language and her time
- ▶ Thanks to Rolando Coto and Ellen Courtney for translation



# Citations

- ▶ Boersma, P. & Weenink, D. (2014). *Praat: doing phonetics by computer* [Computer software]. Version 5.3.53, <http://www.praat.org/>
- ▶ Davis, S. (1988). Syllable onsets as a factor in stress rules. *Phonology*, 5(1), 1–19.
- ▶ Everett, D., & Everett, K. (1984). On the Relevance of Syllable Onsets to Stress Placement. *Linguistic Inquiry*, 15(4), 705–711.
- ▶ Fitzgerald, C. M. (1997). *O'odham rhythms*. Dissertation. The University of Arizona.
- ▶ Hayes, B. (1989). Compensatory Lengthening in Moraic Phonology. *Linguistic Inquiry*, 20(2), 253–306.
- ▶ Hayes, B. (1995). *Metrical stress theory: Principles and case studies*. Chicago: University of Chicago Press.
- ▶ Hayes, B., & Kaun, A. (1996). The role of phonological phrasing in sung and chanted verse. *Linguistic Review*, 13(3–4), 243–303.
- ▶ Stark, S. (1976). The Verb Word of Northern Popoloca. *SIL–Mexico Workpapers*, 2.
- ▶ Stark, S. (2011). Ngigua (Popoloca) Pronouns. *SIL–Mexico Branch Electronic Working Papers*.
- ▶ Stark, S., & Machin, P. (1977). Stress and tone in Tlacoyalco Popoloca. In W. R. Merrifield (Ed.), *Studies in Otomanguan phonology*, (69–92). University of Texas at Arlington: Summer Institute of Linguistics.
- ▶ Stark, S., & Villanueva, V. L. (2011). *Gramática Ngigua de San Marcos Tlacoyalco* (4th ed.). México, D.F.: Instituto Lingüístico de Verano, A. C.
- ▶ Strehlow, T. G. H. (1945). *Aranda phonetics and grammar*. Sydney, New South Wales, Australia: Australian National Research Council.
- ▶ Topintzi, N. (2010). *Onsets: Suprasegmental and prosodic behaviour*. Cambridge, UK; New York: Cambridge University Press.

# Resumptive pronouns

41) Naa **nthaa** tujieto **ntha** are chundaja **ntha** tsje nano.  
[nda:<sup>3</sup>] [nda<sup>3</sup>] [nda<sup>3</sup>]  
A tree thickens it(tree) when has.afterwards it(tree) many years  
A tree becomes thicker when it is older. (Stark 2011)

41) Je'e ndachro ke **nuxra** thu-thji **nuxra**.  
[no<sup>2</sup>ʃ:a<sup>2</sup>] [no<sup>2</sup>ʃa<sup>2</sup>]  
he he.said that blanket very-thick it(blanket).