Acoustic Evidence for Multiple, Quantity-Sensitive Stress in Chukchansi Yokuts

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Overview

Conflicting previous accounts of stress in Chukchansi Yokuts

Finding: **Multiple, Quantity-Sensitive** stress

- **Penult** = primary stress
- Pre-penult **CVV, CVC (= heavy)** = secondary stress

Background

Chukchansi Yokuts

Chukchansi: member of Yokuts language family

Highly endangered: fewer than 10 speakers

Yokuts morphophonology, phonotactics: well-studied

Newman 1944; Kuroda 1967; Collord 1968; Kenstowicz + Kisseberth 1979; Archangeli 1983, 1984, 1991; Noske 1985; Zoll 1993, 2001; Hansson 2005; Guekguezian 2015

Yokuts **stress: not well-studied**, conflicting reports

Newman 1944; Collord 1968; Mello 2012; Guekguezian to appear

Previous Work

Previous studies **differ** on three points …

1. Multiple stresses per word?
2. Quantity-sensitive?
3. CVC = heavy?

… and **agree** on one point

1. Penults stressed, ultimas not stressed (in general)

Previous Work

Author	Multiple Stresses?	Quantity Sensitive?	CVC = Heavy?
Newman	NO	NO	N/A
Collord	YES	YES	YES
Guekguezian	YES	YES	YES
Mello	N/A	YES	NO*

Previous Work

No acoustic evidence: Newman, Collord, Guekguezian

Mello (2012) gives acoustic evidence

- Phonetic correlates: **pitch** and **intensity**

Limitations of Mello (2012):

- Mostly **restricted** to di- and trisyllabic words
- Most words recorded in **isolation**

Goals

Adjudicate between conflicting accounts

- Multiple stresses, quantity-sensitivity, CVC weight

Provide more **acoustic evidence**

Present Study

Questions

1. Penult: always stressed regardless of syllable weight?
2. Any stress before the penult?
   a. Conditioned by syllable position or weight?
   b. CVC = Heavy?

Recording

Single native speaker (female, born 1941)

Bilingual in Chukchansi and English (primary)

Recorded on H4N Zoom Handy Recorder

  Microphone on stand

Analyzed in Praat (Boersma + Weenink)

Acoustic Evidence

- Pitch (F0) and Intensity
  - Correlates of stress in Chukchansi (Mello 2012)
  - Generally correlates of stress (Fry 1955, Beckman 1986)
- Measurements: average across vowel
  - Vowel boundaries determined by formants

Penult vs. Antepenult

Question 1: Biggest pitch, intensity **peak** on **penult**? Regardless of syllable weight?

Comparison: Penult vs. Antepenult

Conditions: **CV** vs. **CVV**; **CV** vs. **CVC**

Pre-penult

Question 2: **Earlier** pitch, intensity peaks?
Determined by syllable **position or weight**?

Comparison: Antepenult vs. Pre-antepenult

Conditions: **CV** vs. **CVV**; **CV** vs. **CVC**

Four Conditions

Question	Conditions	Item 1	Item 2
Peak on Penult?	CV vs. CVV	CV.CVV.σ	CVV.CV.σ
	CV vs. CVC	CV.CVC.σ	CVC.CV.σ
Earlier Peaks?	CV vs. CVV	CV.CVV.σ.σ	CVV.CV.σ.σ
	CV vs. CVC	CV.CVC.σ.σ	CVC.CV.σ.σ

Targets

Target Pairs = Syllable Contrast

Largely controlled for segmental quality

CV vs. **CVC**: [**mo**.**yin**.hil] vs. [**mon**.**de**.hil]

CV vs. **CVV**: [**loo**.**lo**.lo.ta?] vs. [**ʔo**.**yoo**.lo.ta?]

Context

Embedded in **carrier sentences**

- No phrasal stress effects

[mo.yin.hil] “got tired” 

Lagyiw	[moyinhil]	muula’
Yesterday	got tired	mule

“Yesterday the mule got tired”

Data

Condition 1

Biggest pitch, intensity **peak on penult**?

Effect of syllable quantity: **CV** or **CVV**?

CVV.CV.σ vs. **CV.CVV**.σ

[**maa.mi**.la] vs. [**ma.naa**.lit]

Condition 1

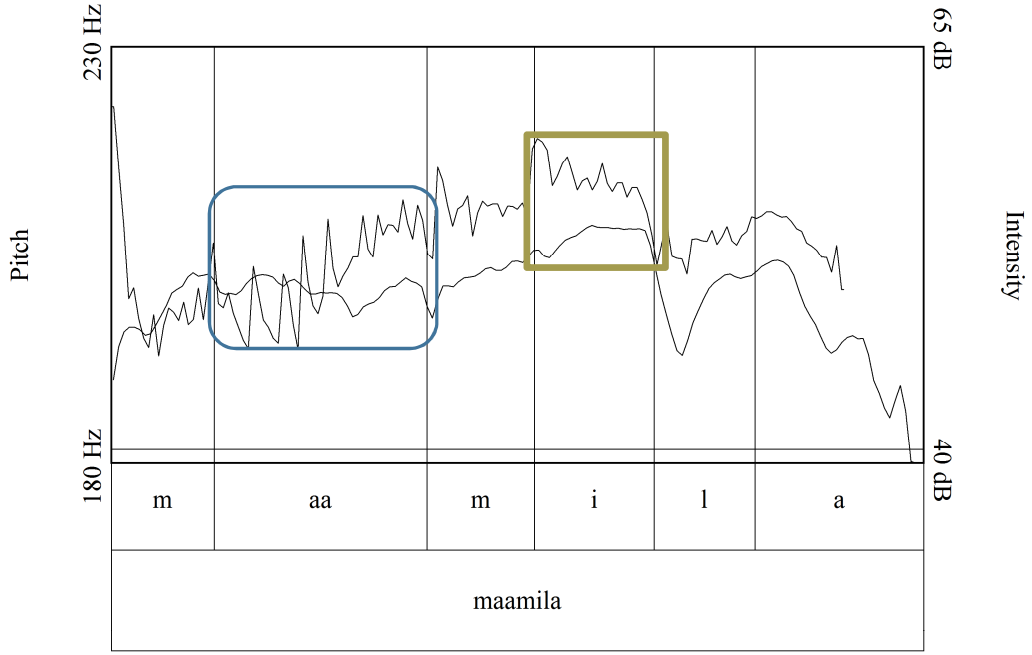
Syllable	[maa.MI.la]			[ma.NAA.lit]		
	Vowel	Pitch	Intensity	Vowel	Pitch	Intensity
Antepenult	Maa	**199.3**	**49.73**	Ma	**197.55**	**49.64**
Penult	MI	**211.4**	**52.28**	NAA	**213.4**	**50.7**

Finding: biggest peak always on **penult**

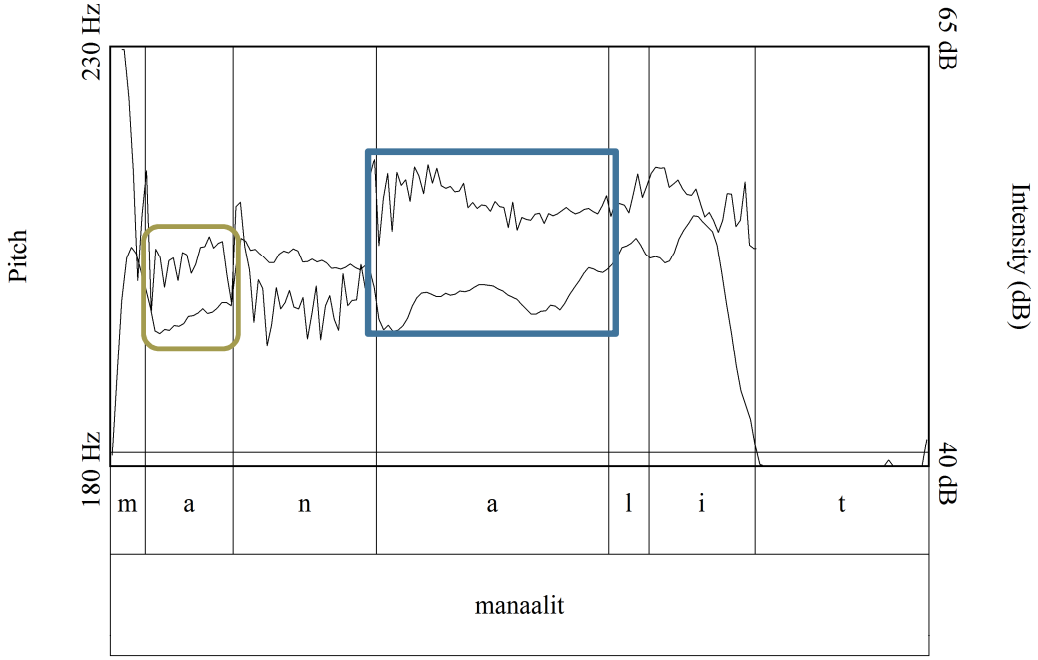
No effect of syllable quantity

[**maa**.**MI**.la]; [**ma**.**NAA**.lit]

Condition 1: [maa.MI.la]



Condition 1: [ma.NAA.lit]



Condition 2

Biggest pitch, intensity **peak on penult**?

Effect of syllable quantity: **CV** or **CVC**?

CVC.CV.σ vs. **CV.CVC**.σ

[**mon.de**.hil] vs. [**mo.yin**.hil]

Condition 2

Syllable	[mon.DE.hil]			[mo.YIN.hil]		
	Vowel	Pitch	Intensity	Vowel	Pitch	Intensity
Antepenult	Mon	**211**	**54.58**	mo	**201.1**	**52.55**
Penult	De	**215.6**	**56.31**	yin	**212.2**	**55.3**

Finding: biggest peak always on **penult**

No effect of syllable quantity

[**mon**.**DE**.hil]; [**mo**.**YIN**.hil]

Condition 3

Earlier pitch, intensity peaks before penult?

Determined by syllable **position or weight** (**CV** or **CVV**)?

CVV.CV.σ.σ vs. **CV.CVV**.σ.σ

[**loo.lo**.lo.ta**ʔ**] vs. [**ʔo.yoo**.lo.ta**ʔ**]

Condition 3

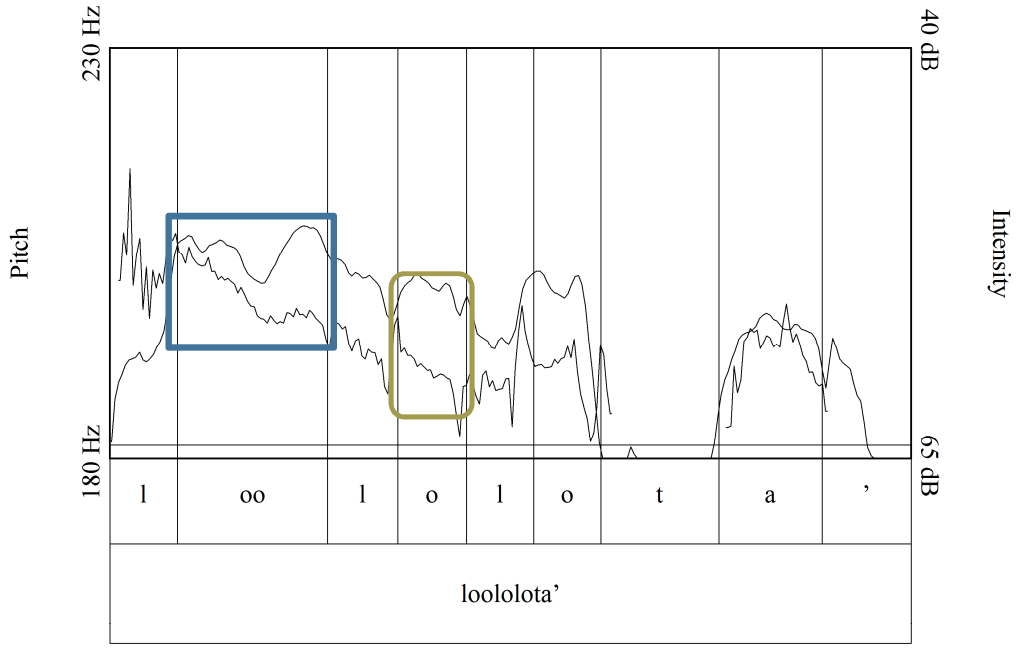
Syllable	[LOO.lo.lo.taʔ]			[ʔo.YOO.lo.taʔ]		
	Vowel	Pitch	Intensity	Vowel	Pitch	Intensity
Pre-antepenult	Loo	**197.9**	**52.06**	ʔo	**200.6**	**51.8**
Antepenult	Lo	**188.6**	**49.76**	Yoo	**217.2**	**53.09**

Finding: **earlier peak** before penult

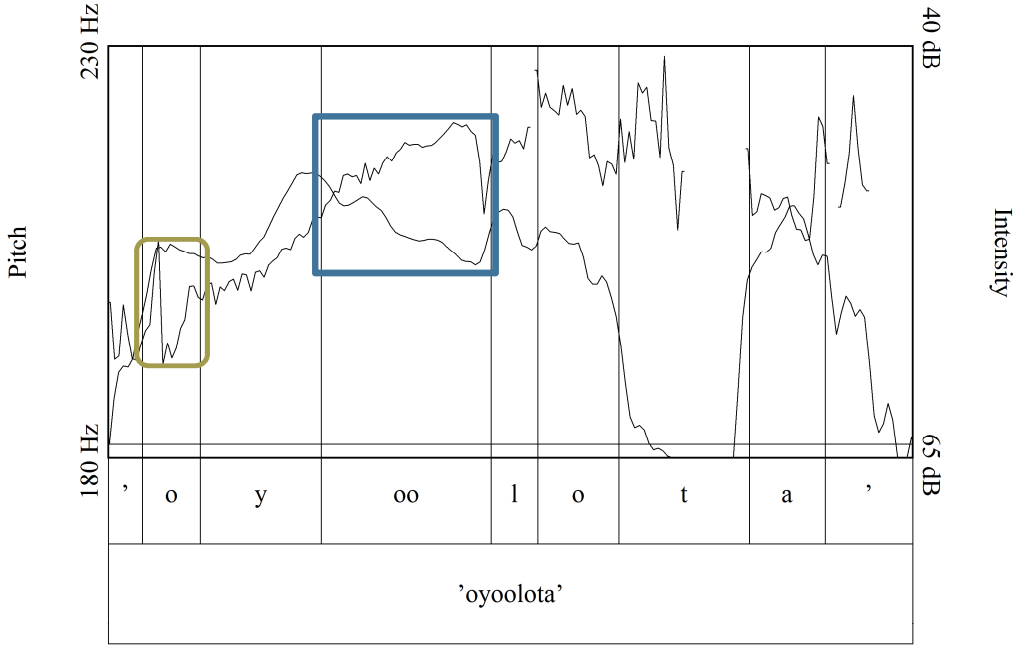
Determined by syllable **quantity**, not position

[**LOO**.**lo**.lo.taʔ]; [**ʔo**.**YOO**.lo.taʔ]

Condition 3: [LOO.lo.lo.taʔ]



Condition 3: [ʔo.YOO.lo.taʔ]



Condition 4

Earlier pitch, intensity peaks before penult?

Determined by syllable **position or weight** (**CV** or **CVC**)?

CVC.CV.σ.σ vs. **CV.CVC**.σ.σ

[**mon.de**.mix.hil] vs. [**mo.yin**.mix.hil]

Condition 4

Syllable	[MON.de.mix.hil]			[mo.YIN.mix.hil]		
	Vowel	Pitch	Intensity	Vowel	Pitch	Intensity
Pre-antepenult	Mon	**220.8**	**55.39**	Mo	**213.1**	**55.7**
Antepenult	De	**218.7**	**53.29**	Yin	**221.7**	**56**

Finding: **earlier peak** before penult

Determined by syllable **quantity**, not position

[**MON**.**de**.mix.hil] vs. [**mo**.**YIN**.mix.hil]

Analysis

Results

Conditions 1 & 2: **Position**, not Weight

Penult = always stressed, not Antepenult

Regardless of syllable weight

Conditions 3 & 4: **Weight**, not Position

Pre-penult CVV, CVC = always stressed, not CV

Regardless of syllable position

Interpretation

Penult CV = stress peak, not antepenult CVV,CVC

Pre-penult: **CVV, CVC** = stress peak, not CV

Primary stress: Penult

Secondary stress: Pre-penult CVV, CVC

Unstressed: Pre-penult CV

Conclusion

Multiple stresses

Penult and pre-penult CVV, CVC

Quantity-sensitive (secondary) stress

Pre-penult: CVV, CVC = stressed, CV = unstressed

THANK YOU!

Crucial Thanks

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To the **PhonLunch** audience at University of Southern California

Selected References

Collord, Thomas. 1968. *Yokuts Grammar: Chukchansi*. PhD Dissertation, University of California, Berkeley.

Guekguezian, Peter. to appear. The great Chukchansi Yokuts iambic conspiracy. in *Supplemental Proceedings of Phonology 2014.* LSA.

Mello, Daniel. 2012. *The Stress System of Chukchansi Yokuts*. Master's Thesis, California State University, Fresno.

Newman, Stanley. 1944. *Yokuts Language of California*. New York: Viking.

Next Steps

Secondary stress in [**CVC**.σ.σ], [**CVV**.σ.σ]?

Contrast with [**CV**.σ.σ]?

Stress on **ultima**?

Contrast: [σ.**CV**] vs. [σ.**CVC**]?

Pitch contour as acoustic correlate of stress?