

Falsetto in A'ingae (Cofán)

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Phonation types across languages

- ▶ Cross-linguistically, non-modal phonation – e.g. creaky voice, breathy voice – can have a variety of different uses
- ▶ In some languages, these phonation types may behave like other phonological contrasts, or be cues to prosodic structure
 - ▶ e.g. contrastive breathy, creaky, and modally voiced vowels in Jalapa Mazatec (Maddieson & Ladefoged 1996: 317)
 - ▶ e.g. phrase-final creaky voice in English (Epstein 2002)
- ▶ In others, these same features may be also be used in less grammatically constrained ways
 - ▶ e.g. English creaky voice can be produced across longer stretches, with iconic meanings such as toughness (Mendoza-Denton 2007) and young female authority (Yuasa 2010)

Falsetto

- ▶ In contrast, falsetto is a phonation type which is typically either described as being formally unconstrained or (more commonly) formal features simply go unmentioned
- ▶ In terms of meaning/function, Stross 2013's survey concludes that "most meanings associated with falsetto voice ... are motivated rather than arbitrary"
 - ▶ i.e. meanings are related to the high pitch, rather than carrying regular lexical contrasts or other grammatical characteristics
- ▶ Falsetto is consistently more like English creak than in Jalpa Mazatec creak, in that it is not phonologically specified

Background: Functions of Falsetto

- ▶ Stross 2013's recent survey identifies a number of conventionalized, but nonetheless iconic functions falsetto is claimed to have across languages:

Deference/politeness: Tojolab'al (Furbee-Losee 1976), Tzeltal and Tsotsil (Stross 2013) and Lachixío Zapotec (Sicoli 2010)

Excitement/“speaker involvement”: Huichol (Grimes 1955), AAVE (Thomas 2007)

Imitation/emulation: actual (Podesva 2007) or fictional (Keating 2014) personas in English; mocking such personas in Nahuatl (Klein 2001)

- ▶ This iconicity in function is paralleled by the observation (often not made explicit) that falsetto can extend over arbitrarily long stretches of discourse, with no particular prosodic or syntactic restrictions

This talk

- ▶ **Today:** analyze falsetto in narratives in **A'ingae**, a language isolate from Ecuador and Colombia
 - ▶ Form: falsetto in A'ingae overwhelmingly occurs on a single stressed syllable adjacent to a major prosodic boundary
 - ▶ Function/meaning: falsetto in A'ingae primarily is used to convey a non-iconic meaning, signaling a shift in narrative perspective
- ▶ Given how different A'ingae falsetto is, we also show in detail acoustically that this is indeed falsetto rather than a different sort of pitch effect
- ▶ **Sample narrative (5:27)** displayed in LingView, a front-end UI for showing time-aligned annotations from ELAN (Tomlin, Pride, and AnderBois ms.)

Background: Articulatory Phonetics

- ▶ Vocal folds are tensed so only the internal upper edges vibrate
- ▶ Changes the open-closed cycle and the mass of the vibrating element

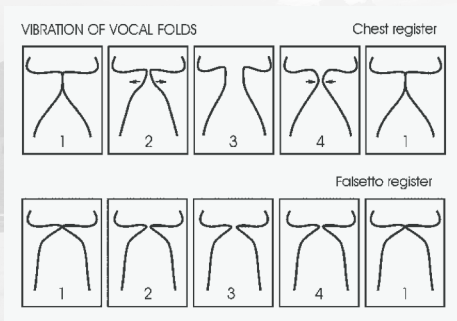


Figure: Vibration Cycle Types

(Miller and Schutte 2005)

Background: Acoustics

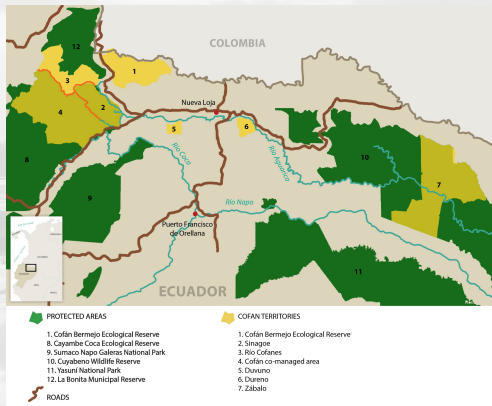
The mode of vibration is reflected in:

- ▶ higher F0
- ▶ steeper spectral slope (low harmonics are higher intensity)
- ▶ higher jitter (more cycle-to-cycle variation in F0)
- ▶ reduced harmonics-to-noise ratio (HNR)

(Keating 2014, Childers and Lee 1991, Neiman et al. 1997)

A'ingae and its speakers

- ▶ A'ingae (Cofán, Kofán) – isolate spoken in Ecuador/Colombia, endangered esp. in Colombia
- ▶ 1,500 speakers
- ▶ Traditional territory in Andean foothills, moved further into Amazonia in recent decades in response to oil exploration, colonization, etc.



A'ingae phonology

- ▶ Recent grammatical sketch by Fischer and Hengeveld (ms), instrumentally based phonetic and phonological sketch by Repetti-Ludlow et. al (ms)
- ▶ The system includes stress
 - ▶ Restricted in position: Usually occurs on the penultimate or antepenultimate syllable; never word-final
 - ▶ Regularly signaled by duration, as well as raised F0 (in most contexts observed)

Our data

- ▶ Data from traditional, historical, and personal narratives from ongoing community-based language documentation project
- ▶ This study: 6 male speakers from Zábalo – in part to facilitate easy cross-speaker comparison and in part because falsetto is used less frequently by female speakers in our corpus



Where falsetto occurs: Syllable level

- Consistently on a single syllable; the rapid F0 rise and fall only weakly influences the edges of neighboring syllables:

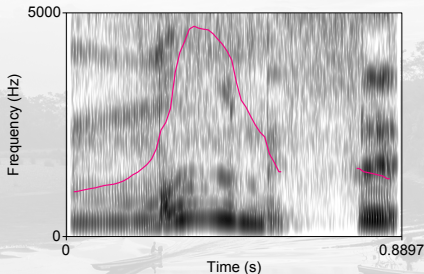


Figure: F0 in a word with falsetto: *majantsû* [mahantʰi]

- Only 2 (of 68) cases extend over an additional syllable; both begin on a penultimate stressed syllable and continue through the final syllable

Where falsetto occurs: Stressed syllables

- ▶ The overwhelming majority of falsetto was on stressed syllables
- ▶ There were 3 clear occurrences on unstressed phrase-final syllables
- ▶ There were several additional ambiguous cases where the underlying stress might be influenced by following morphemes

How it is realized

- ▶ Acoustic characteristics are consistent with falsetto observed in other languages
- ▶ Compared to stressed, and unstressed syllables, based on 68 clear examples from each category. Items were paired by each speaker, recording, vowel quality, and position in the word

F0

The primary acoustic cue to falsetto is high F0

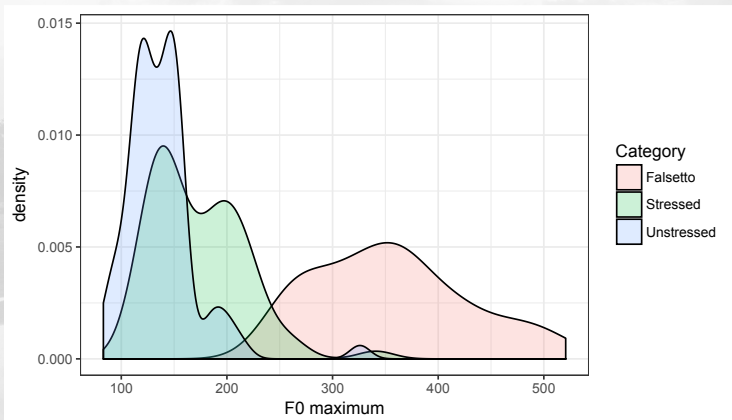


Figure: Distribution of F0 maxima, by category

Spectral tilt

Spectral tilt is also very distinct

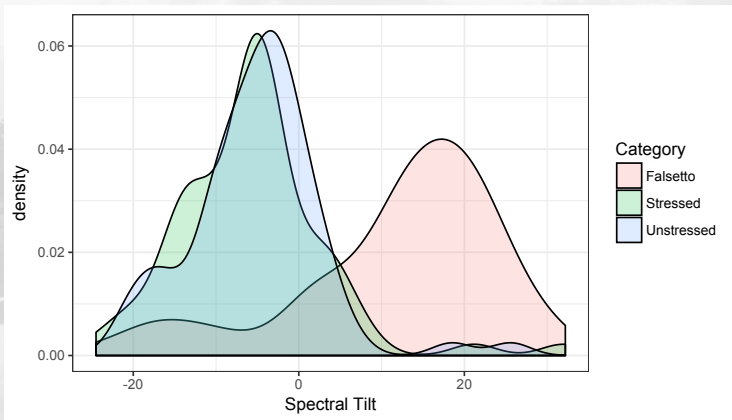


Figure: Distribution of spectral tilt, by category

Jitter

There is slightly more jitter in falsetto than other voicing

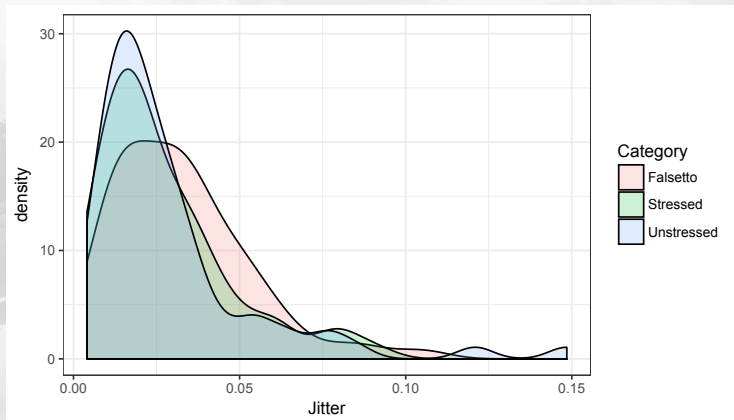


Figure: Distribution of jitter, by category

Harmonics-to-Noise Ratio

Similar Harmonics-to-Noise Ratio in falsetto and other syllables

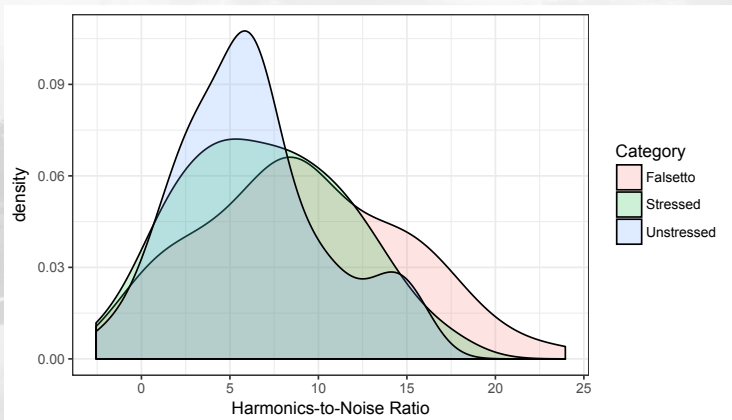


Figure: Distribution of HNR, by category

Vowel duration

Vowel duration in falsetto syllables (not an inherently expected characteristic) is similar to stressed syllables, but with more outliers

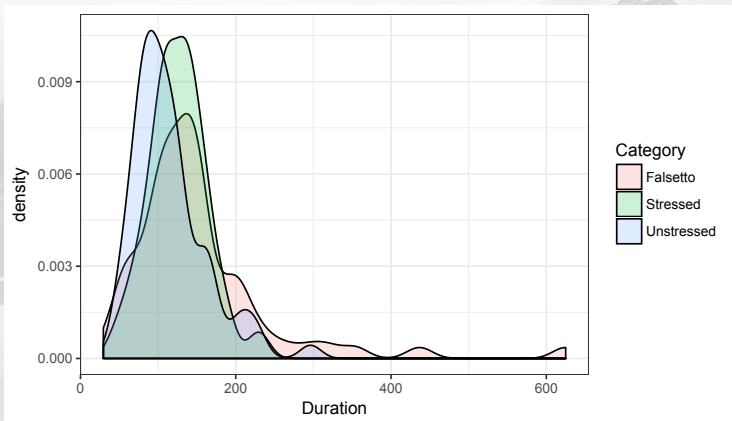


Figure: Distribution of vowel duration, by category

Two main uses

Preliminarily, we identify two distinct (but phonetically similar) uses:

Excitement to emphasize a given word and/or to signal excitement

Perspective-shift to indicate a shift between perspectives or speakers in a narrative with multiple agents

- ▶ Excitement is iconic – similar to a few other cases of falsetto in the literature, e.g. Huichol (Grimes 1955), AAVE (Thomas 2007)
- ▶ Perspective-shift is non-iconic – different from other quotation-related uses of falsetto in ways we will see

Emphasis/excitement use

- ▶ (Few tokens of emphatic use, so claims here are tentative)
- ▶ Emphatic cases we have found are still realized on a single stressed syllable, but
 - ▶ May be clause/intonational phrase-medial
 - ▶ May have lengthening or repetition

- (1) Yushava=ma tsa kukama kû-ñã-'je-ni, pandu
iron=ACC ANA Spaniard red-CAUS-IMPV=LOC fox
tsûi-fa-'u ja-yi=ya.
walk=LAT=AUG go-PROSP=ASSERT
'When the Spaniard was the heating the iron, the fox came walking
by.'
- [Play](#) [20170804_kuke_chiste_FACQ]

Phonetic differences between the uses

- ▶ Most acoustic characteristics do not differ between the two semantic functions, but duration does
- ▶ Emphatic uses are somewhat longer in general, though the difference is exaggerated by outliers

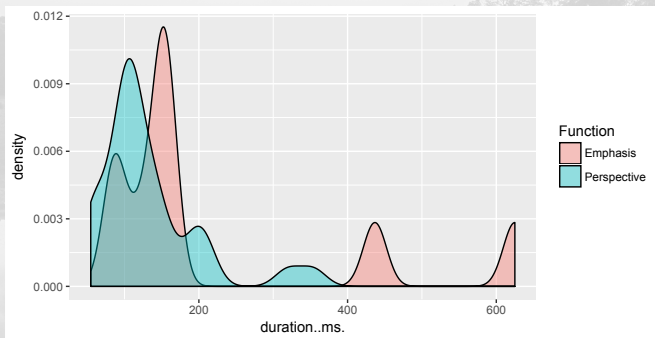


Figure: Distribution of vowel duration, by falsetto type

Perspective-shift use

- ▶ The most common use of falsetto in A'ingae is to signal a shift in perspective in narratives with multiple characters
- ▶ Unlike the emphasis/excitement use, this perspective-shift use is more or less limited to the first or last stressed syllable of a clause
- ▶ That is to say, it indicates that that clausal boundary coincides with a shift in narrative perspective

(2) [Anthepuchu-'khu=nga ja=pa]_{IP} [kan=fa='u dyai='ya
island-CLF=DAT go=SS look=CLF=AUG sit=ASSERT
a'tû-pa]_{IP}
bury-ASSOC

'He went to the island, he looked to hide in it (i.e. to hide)'

[20170804_kuke_chiste_FACQ]

Play

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(3) Iñaja=mba indi=pa vachu=pa indi=pa an-'je=ña -tsa'kaen
ask.for=SS get=SS net=SS get=SS eat-PFV like.that
kanse- tise='khe ...

live 3SG=ADD

'He asked for and got nets to (catch fish and) eat – I lived like this –
He also... '

Play

[20170803_hammocks_fishing_nets_LC]

Perspective-shift and reported speech

- ▶ In the previous example, the perspective-shift in question is otherwise largely implicit
- ▶ However, in many cases, perspective-shift falsetto occurs along with other reported speech devices
- ▶ Indirect speech report (i.e. 'X said that p'):

(4) ju-va andefa=khu=ni **phi** sũ=ya. Andefa=khu=ni
PRO-DIST sling=CLF=LOC sit.in say=ASSERT sling=CLF=LOC
ana-ñe phi=si ...
sleep-INF sit.in=SS
'[If he wants to see the son,] that one is sitting in the sling, the mother
said. The son having sat to sleep, ...'
[20170807_canjansi_cofan_JWC]

Play

Perspective-shift and reported speech

- ▶ In the previous example, the perspective-shift in question is otherwise largely implicit
- ▶ However, in many cases, perspective-shift falsetto occurs along with other reported speech devices
- ▶ Direct speech report, i.e. quotation (i.e. 'X said "...".'):

- (5) Paisano, junguesu ki an-'jen=khen=de su='ya.
paisano what 2 eat-IPFV=DEM=REP say=ASSERT
Thun'thu=ma=ngi an-jen=khen fa'e'=te su='ya.
naranjilla=ACC=1 eat-IPFV=DEM other=REP say=ASSERT
' "Paisano, what are you eating?" asked the bear. "I'm eating
naranjillas" the other replied.'
- [20170804kuke_chiste_FACQ]

Play

Perspective-shift

- ▶ In previously documented cases (e.g. English), falsetto occurs on some or all of a quotation, indexing something about the person being quoted or the speaker's perception of them
- ▶ While A'ingae falsetto can co-occur with quotation, it is only on a single syllable and indicates the shift in perspective of the quotation, rather than characteristics of the original speaker
- ▶ Moreover, it also occurs in other cases of perspective-shift, including things that are more like Free-Indirect Discourse

Conclusions

This talk: we have explored the use of falsetto in A'ingae

- ▶ Previously documented cases of falsetto are formally unconstrained and functionally express various kinds of iconic meanings
- ▶ We have shown that falsetto in A'ingae is different:
 - ▶ **Formally:** realized on a single syllable adjacent to a syntactic/prosodic boundary (in perspective-shift use)
 - ▶ **Functionally:** perspective-shift use is non-iconic – no connection between acoustics of falsetto and switching perspectives in discourse

Chiga tsû afepoenjan! Thank you! Gracias!

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