The Affective Roots of Gender Patterns in the Use of Creaky Voice

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Introduction

Prevalence of creaky voice among young women
- Popular media
  (e.g., Fessenden 2011, Steinmetz 2011, Quenqua 2012, Arana 2013)
- Scholarly research
  (Yuasa 2010, Wolk, Abdelli-Beruh, and Slavin 2012, Podesva 2013)

An exclusively gendered discourse about creak fails to explain why women might creak more than men.

Creaky voice serves a negative, disengaged affective function (which underlies gender differences in its use).

Two Questions

1. To what extent do (young) women produce more creaky voice than men (and older women)?

   - Quantitative variationist study of 93 speakers from California examining the incidence and acoustic character of creaky voice

2. Why do women (and men) produce creaky voice?

   - Quantitative study investigating correlations between non-vocal expressions of affect and the production of creaky voice, among 42 speakers from California (and the Western US)

Public Discourses About Creaky Voice

A Vocal 'Pandemic' Among Young Women

Singers like Britney Spears slip into vocal fry when hitting low notes or for sultry effect, noted *Science* NOW's Marissa Fessenden, characterizing the creak as a "language fad." Kim Kardashian is guilty of it. So is Zooey Deschanel.

Listen to **Slate**'s show about the much-reviled phenomenon, prominent among young American women, of "creaky voice."

Counter-Discourses About Creaky Voice

'There are languages that use creak as part of the phonemic system,' says [Linguist Patricia Keating of UCLA]. 'The chances of it leading to vocal damage are very minimal.'"

Women have long tended to be the linguistic innovators...If you want to see where language is going...you find a young, urban woman.

In large part, the story of language is one of the dominant political group trying to fix the linguistic code in place, and those below them pushing and pulling it loose.

Quantitative Research on Gender Differences in Creak

Previous studies observing more creak among women:
- Young American English-speaking women creak a greater percentage of words than men (Yuasa 2010)
- College-aged women produced more vocal fry in read sentences than a matched sample of men (Wolk, Abdelli-Beruh, and Slavin 2012, Abdelli-Beruh, Wolk, and Slavin 2014)
- White and African American women in Washington, DC, creak a greater percentage of phrases than men (Podesva 2013)

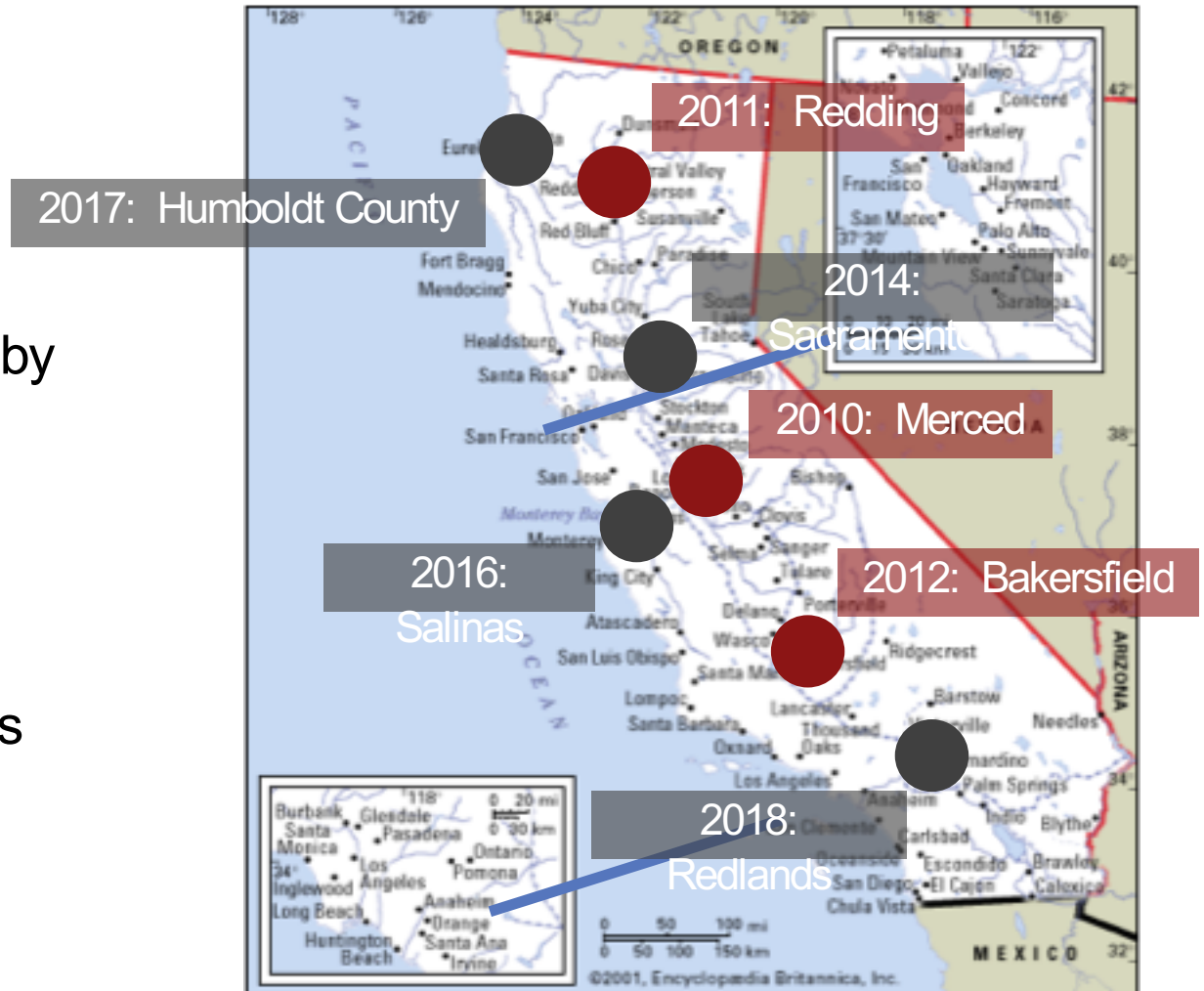Desired characteristics of quantitative study:
- Larger number of speakers
- Single regional dialect
- Longer samples of spontaneous speech
- Age-stratified speaker sample

Voices of California

Roughly hour-long sociolinguistic interviews by student and faculty fieldworkers for Voices of California Project

Creak examined among speakers from 3 field sites

- Redding
- Merced
- Bakersfield

2011: Redding

2017: Humboldt County

2014: Sacramento

2010: Merced

2012: Bakersfield

2016: Salinas

2018: Redlands

Sample

93 white speakers					
32 from Bakersfield		31 from Merced		30 from Redding	
16 female	16 male	16 female	15 male	16 female	14 male
22-90 years old	24-81 years old	26-93 years old	18-90 years old	18-73 years old	18-63 years old

Methods

Annotation

- Orthographic transcriptions in ELAN (Lausberg & Sloetjes 2009) or Transcriber (Barras et al. 1998)
- Forced alignments generated with FAVE (Rosenfelder et al. 2011)

Extraction of Acoustic Measurements

- Measurements taken for all vowel intervals every 10 ms in Praat, based on methods in Vicenik (nd), Iseli et al. (2007), Shue (2009)
- Spectral tilt: H1*-H2*, H1*-A1*, H1*-A2*, H1*-A3*, A1*-A3*, 2k-5k
- Periodicity: cepstral peak prominence (CPP), smoothed CPP (CPPS), harmonics-to-noise ratio (HNR), HNR on low-pass filtered spectrum (500Hz: HNR05, 1500 Hz: HNR15, 2500 Hz: HNR25)
- Nasality: A1*-P0
- F0, F1, F2, intensity

Methods

Post-Processing

- Data reduced to one record (median) per vowel segment
- Exclusions
  - phone duration ≤ 50ms or ≥ 283 ms (median of log duration + 2 s.d.)
  - outliers ($\pm$ 2 s.d) in F1, F2, intensity, log F0, A1*-P0
- Phrase segmentation from pauses; position of vowel midpoint in phrase from 0 to 1
- Preceding and following segments from aligned TextGrids
- Intensity normalization by speaker mean intensity
- Word frequency from in-corpus token count

Creak Detection

- All vowels coded as $\pm$creaky by a neural network classifier
- MATLAB implementation of Kane, Drugman, and Gobl (2013) algorithm, which factors in a number of acoustic parameters

Methods

Statistical Analysis

Response   ±creaky (logistic model)
                     H1*-H2* (linear model), CPPS (linear model)

Random Effects   speaker, preceding sound, following sound

Fixed Effects   **Linguistic**   **Social**
                     F1, F2   gender
                     F0*   age (linear and quadratic terms)
                     phone duration*   field site
                     intensity   orientation to land
                     word frequency*
                     phrase position
                     IP duration*
                     A1*-P0

All continuous variables scaled and centered.

* log-transformed to ensure normal distribution

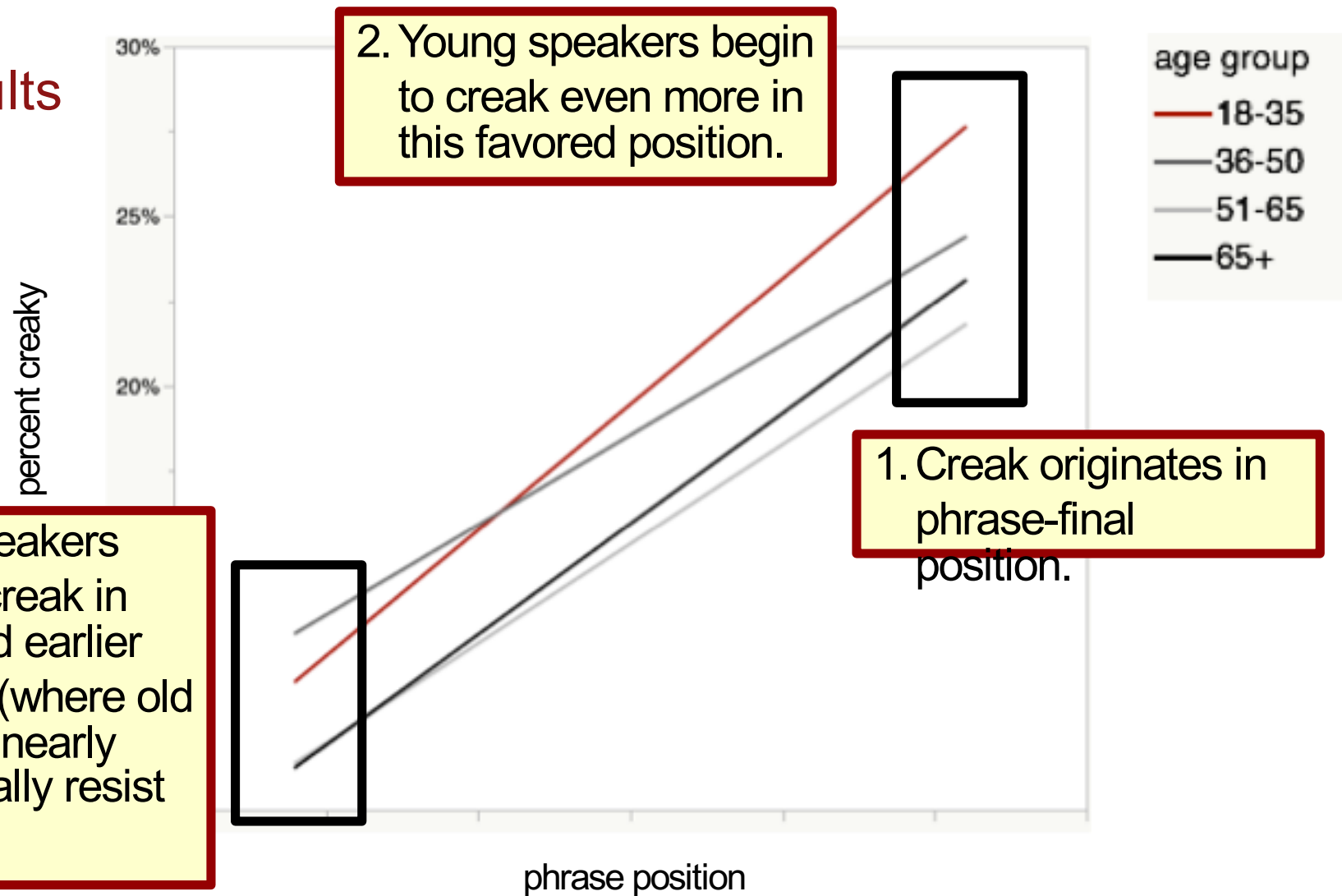# Summary of Results

Factors Influencing Incidence of Creak

Main Effects
- Phrase Position   creak increasingly likely as phrases progress
- Gender   women more likely to creak than men
- Age   younger speakers more likely to creak than older
- Land Orientation   speakers who earn living off land creak less

Interactions
- Phrase Position * Age   age effect varies as function of phrase position
- Gender * Age(q)   youngest and oldest women more likely to creak than middle-aged women

Results

age group
— 18-35
— 36-50
— 51-65
— 65+

2. Young speakers begin to creak even more in this favored position.

1. Creak originates in phrase-final position.

3. Young speakers begin to creak in disfavored earlier positions (where old speakers nearly categorically resist creaking).

percent creaky

phrase position

30%

25%

20%

Results

Women are creakier than men.

Older men are breathier than younger men.

Women show a curvilinear pattern, with highest incidence of creak among the youngest and oldest women.
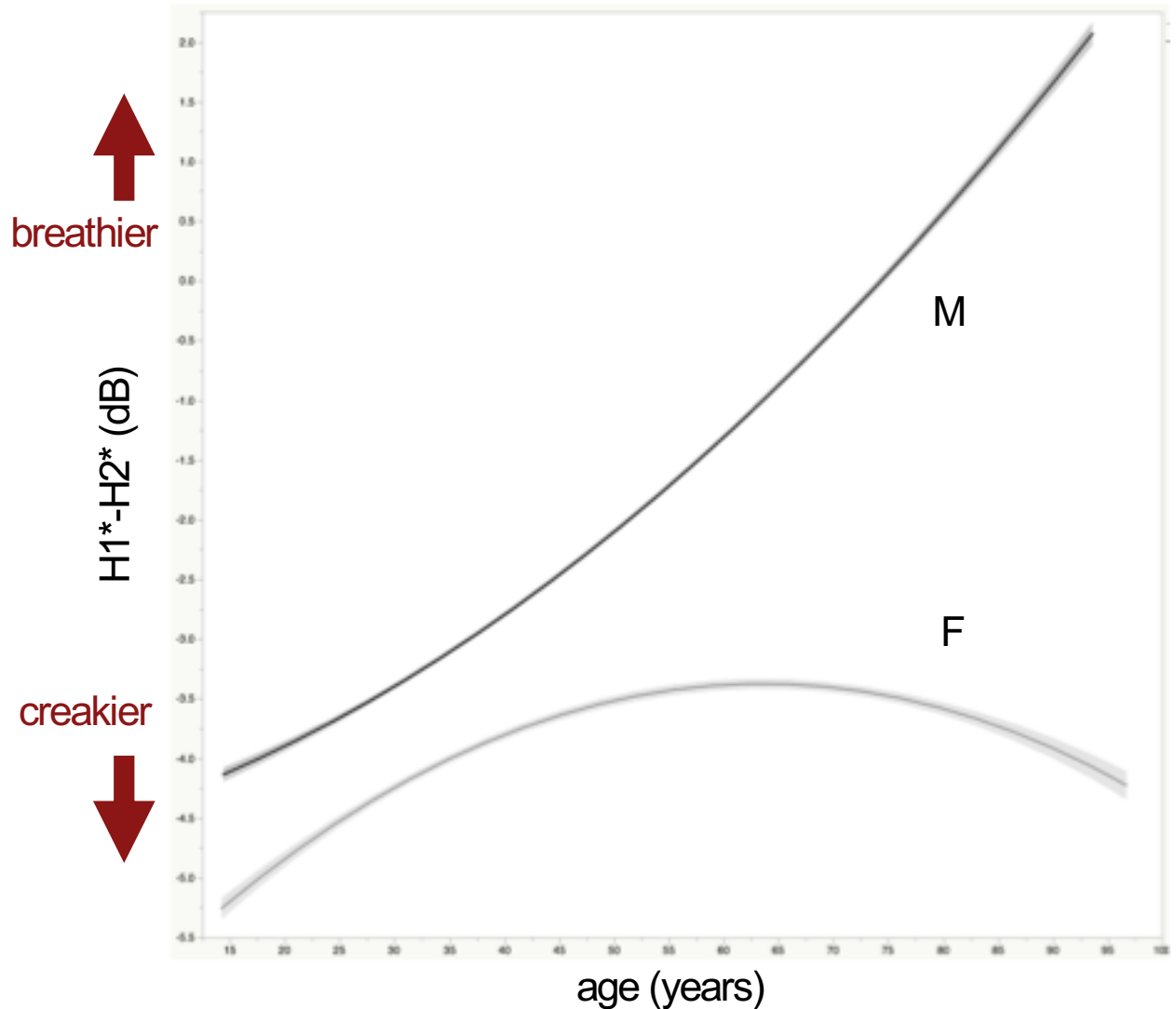
Interim Conclusion

Do young women creak the most?

- Yes, but...
- Young men and the oldest women creak a lot, too.
- A focus on gender can obscure other relevant social dimensions (e.g. orientation to land).

Why do people use creaky voice?

Counter-Discourses About Creaky Voice

The New York Times

'If women do something like uptalk or vocal fry, it's immediately interpreted as insecure, emotional or even stupid,' said Carmen Fought, a professor of linguistics at Pitzer College in Claremont, Calif. 'The truth is this: Young women take linguistic features and use them as power tools for building relationships.'

'A lot of these really flamboyant things you hear are cute, and girls are supposed to be cute,' said Penny Eckert, a professor of linguistics at Stanford University. 'But they're not just using them because they're girls. They're using them to achieve some kind of interactional and stylistic end.'

The Social Meaning of Creaky Voice

Interviewer: When- When did they- When did your parents *get* a divorce?
Jessica: Uh- Shortly after (.) *we had moved there,*

Jessica: They were in the *process of getting a divorce*
Interviewer: Oh I see.

Jessica: So we moved up there,
Jessica: And then,

Jessica: *They decided to get a divorce so we moved back*

Discourse Analytic Work on Affective Function of Creak

Previous studies suggest that creak conveys negative affect/disengagement:
- Creaky voice distances parenthetical speech from main narrative thread; also to distance speakers from issue under discussion (Lee 2015)
- Creaky *yeah* expresses either disalignment between interlocutors or dispreference to continue on current topic (Grivičić and Nilep 2004)
- Transmasculine speaker creaks to index "a stance of disaffectation, an aloof persona, or a kind of emotional stoicism" (Zimman 2014)

Can this affective function of creak be generalized?

If creaky voice conveys negative, disengaged affect...

Modality of Affect Expression	Form of Affect Expression	Predicted Correlation with Creaky Voice
Self-Report	Comfortable	Less
Self-Report	Enjoyable	Less

Interactional Sociophonetics Laboratory

Desired characteristics of quantitative study:

- Larger number of speakers
- Audio-visual data
- Comfortable social environment
- Assessments of affect
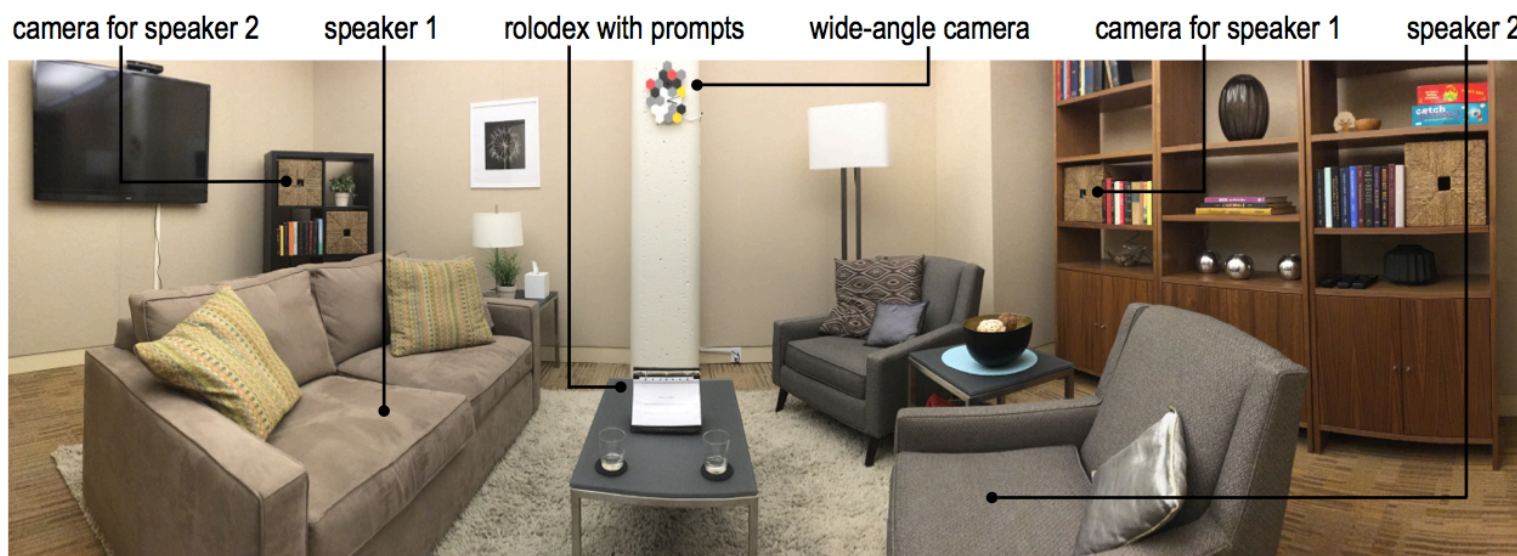
Acoustical specifications of sound booth, staged as living room

Data Collection

Separate audio and video recordings for each speaker

Dyadic interactions, video and audio (wireless microphones) recorded

~30 min of conversation, with aid of prompts

Post-recording survey (demographic information, assessments)

Example Recording

Sample: 42 speakers from the Western United States

Gender	26 women
	16 men
Age	25 undergraduates (18-22 years old)
	17 older adults (23 years old and up)
Race	21 white
	6 African American/white
	5 Asian/Pacific Islander
	3 Asian/white
	2 Native American
	2 other multiracial
	1 each of African American, Latinx, Middle Eastern
Sexual Orientation	32 straight
	7 LGBTQ
	3 unspecified

Valence, Arousal, and Dominance Lexicons

word	valence	arousal	dominance
emptiness	0.177	0.173	0.184
menace	0.125	0.894	0.759
floral	0.833	0.235	0.264
champion	0.89	0.88	0.945

(Mohammad 2018)

Sentiment Analysis

"but no- nothing long term -- I mean, I haven't had that many long term"
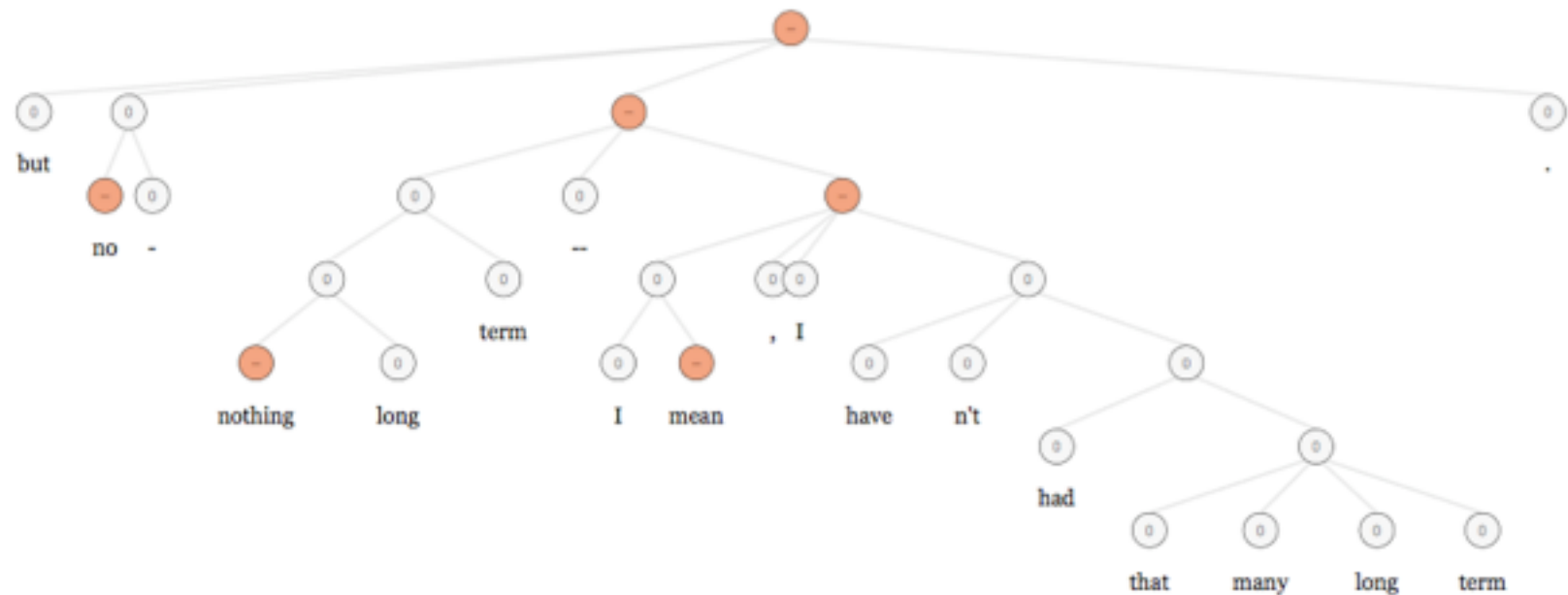
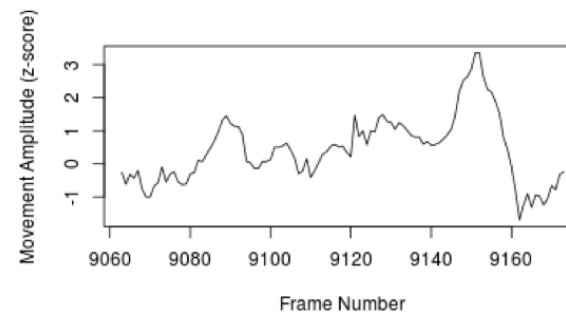(Socher, Perelygin, Wu, Chuang, Manning, Ng, and Potts 2013)

Smiling Annotation

smiling = ~~FALSE~~ TRUE

Haar cascade classifier trained on open source corpus of photographs hand-annotated for ±smiling (http://github.com/hromi/SMILEsmileD).

Each frame of video run through classifier.

Quantifying Movement

Movement Amplitude
Voigt, Podesva & Jurafsky (2014)

If creaky voice conveys negative, disengaged affect...

Modality of Affect Expression	Form of Affect Expression	Predicted Correlation with Creaky Voice	Result
Self-Report	Comfortable	Less	
Self-Report	Enjoyable	Less	YES
Lexical/Semantic	Valence	Lower	
Lexical/Semantic	Arousal	Lower	
Lexical/Semantic	Dominance	Lower	YES
Lexical/Semantic	Sentiment	More Negative	
Embodied	Smiling	Less	YES*
Embodied	Body Movement	Less	YES

* female speakers only

Discussion

Data largely support hypothesis that creaky voice conveys negative, disengaged affect (all four significant results, spanning all three modalities, in predicted direction)

Potential explanations for no observed correlation:
- There is no connection
- Not enough statistical power (single comfort level rating per interaction) Crowdsourcing to obtain dynamic assessments as interactions unfold?
- Methods insufficiently robust (sentiment analysis developed for movie review text, not spontaneous speech)

Why do young women creak the most?

- (Young) female speakers creak more than others.
- Regardless of gender, people creak more when moving less, on words that convey low dominance, in less enjoyable interactions.
- Women do not move less, use less dominant lexical items, or enjoy interactions less than men overall.

Women creak more because they appear to prefer creak as a means of enacting a negative, disengaged stance.

Why convey negative, disengaged stance with creak?

The social meaning of creak, though interactionally relevant, does not contribute to the referential meaning of the utterance that carries it.

Because this meaning is not at issue, speakers can express affect without doing so directly (Besnier 1990).

A: *Yeah*
B: # Why are you disengaging?

Plausible deniability of disengagement is useful!

Meaning of Creak

Yeah

'negative, disengaged affect'

- better than 'young female'
- but we can probably do better
  - 'negative' = evaluative stance
  - 'disengaged' = (lack of) alignment between interactants

Meaning of Uptalk

Assertive rising declaratives (Jeong 2018)
My name is Anna? I'll be your waitress?

1. Speaker committed to proposition
2. Speaker introduces metalinguistic issue (MLI) to the Table

- ARDs perceived as more polite, follows from (2)
- ARDs perceived as feminine for similar reasons

Gendered meanings follow from core meaning.

Conclusion

Gender can't be the whole story.

The prevalence of creak among women is less about gender than affect expression, which can neither be separated from nor reduced to gender.

Creaky voice is interactionally useful.

- This point combats sexism underlying many linguistic ideologies.
- This point is a descriptive fact.

Thank You!

Questions?

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