# Creaky Voice in a diverse gender sample: Challenging ideologies about sex, gender and creak in American English

KARA BECKER, REED COLLEGE

SAMEER UD DOWLA KHAN, REED COLLEGE

LAL ZIMMAN, UC SANTA BARBARA

GUEST LECTURE BY SAMEER UD DOWLA KHAN

FOR CHRISTINA M. ESPOSITO

10 FEBRUARY 2016

# Background

- Conflicting perspectives on the link between gender and creaky voice, which has been associated with:
  - **Men** in the UK (Esling 1978; Henton & Bladon 1988; Stuart-Smith 1999)
  - **Young, white women** in the US (Yuasa 2010; Podesva 2013)
  - **Chicano/a gangsters** (Mendoza-Denton 2007, 2011)
  - **Men** who are (perceived as) **gay/queer** (Podesva 2007; Zimman 2013)
- Gendered meaning of creak is still uncertain

# Background

- Previous studies all operate within the gender binary
- Limitations of this view:
  - Restricts our theorization of gendered social meaning to two options: **maleness/masculinity** and **femaleness/femininity**
  - Encourages **simplification of gendered meaning** based on broad correlations
  - Does not reflect the **full diversity** of the population. What about **trans speakers**?
  - Hard to tease apart **socialization**, **identity**, **physiology**

# Our goals

- To include speakers with a **wider range of identifications** related to sex and gender
- To take a more **nuanced view** of gender identity and different aspects of sex
- To pay special attention to how creak relates to **queer** and **trans** identities
  - Zimman (2012, 2013) suggests that trans men may be especially creaky

*Who uses creak?*

*Can a more diverse sample wrt sex and gender help us get a handle on creak's social meanings?*

# Coding for sex and gender

- Factors to consider
  - **Identity**: current self-reported gender
  - **Socialization**: sex assignment at birth
  - **Laryngeal physiology**: exposure to testosterone
- Operationalized as 2 factors, each with 3 levels
  - **Gender identity**: female, male, non-binary
  - **Sex assigned at birth** and current **hormonal status**:
    - Male-assigned (AMAB)
    - Female-assigned, not on testosterone (AFAB)
    - Female-assigned, on testosterone (AFAB+T)

# Identity categories

|         | Female      | Male                          | Non-binary                        |
|---------|-------------|-------------------------------|-----------------------------------|
| **AMAB**  | Trans women | Cis men                       | AMAB non-binary                   |
| **AFAB**  | Cis women   | Trans men, not on testosterone | AFAB non-binary, not on testosterone |
| **AFAB+T** | N/A         | Trans men, on testosterone    | AFAB non-binary, on testosterone  |

# Methods: Data collection

- Native speakers of American English, ages 18-35:
  - Recorded in 2013, at Reed College Lab of Linguistics (LoL) in Portland, Oregon
  - 80% self-reported as white or Caucasian
- 2 speech styles:
  - **Casual interview** discussing speaker's hometown
  - Scripted reading of the **Rainbow Passage**

# Methods: Speakers

- Speakers self-reported their gender identity, assigned sex, and hormonal status in a post-recording questionnaire and/or online survey

|        | Female | Male | Non-binary | Total |
|--------|--------|------|------------|-------|
| AMAB   | 8      | 6    | 5          | 19    |
| AFAB   | 6      | 2    | 10         | 18    |
| AFAB+T | N/A    | 7    | 7          | 14    |
| Total  | 14     | 15   | 22         | 51    |

# Methods: Subsample

We present results from a subsample of 27 speakers:

|        | Female | Male | Non-binary | Total |
|--------|--------|------|------------|-------|
| AMAB   | 3      | 6    | 3          | 12    |
| AFAB   | 6      | 2    | 1          | 9     |
| AFAB+T | N/A    | 4    | 2          | 6     |
| Total  | 9      | 12   | 6          | 27    |

# Methods: Transcription

- Segmental: Phonemic transcriptions and segmentations automatically generated by FAVE (Rosenfelder et al. 2011)
  - Full recording of Rainbow Passage
  - First 5 minutes of the casual interview recording
  - Boundaries hand-corrected by RA in cases of FAVE error

- Prosodic: Locations of right edges of intonation phrases (IPs), and IP boundary tone type, using ToBI labels (Veilleux et al. 2006, Beckman & Ayers Elam 1997)
  - L-L%: low falling (e.g. declarative)
  - L-H%: low rising (e.g. continuation rise)
  - H-H%: high rising (e.g. yes/no question)
  - H-L%: high plateau (e.g. trailing off)
  - !H-L%: downstepped plateau (e.g. calling contour)

# Methods: Auditory coding

- Each vowel was coded by a primary coder for:
  - **Voice quality**: modal, creaky, other (e.g. breathy), or unsure
  - **Pitch accents: unaccented, accented, nuclear accented**
  - **Vowel quality: generated by FAVE, hand-corrected by RA**
- A secondary coder coded for voice quality
  - Mean inter-coder reliability across recordings: **84.9%**
- Discrepancies between coders resolved by authors
  - In cases where no 2 coders agreed on a given vowel's voice quality code, that vowel was discarded

# Methods: Auditory coding

- All coding was done auditorily, as in previous work on creak and gender (Podesva 2013; Zimman 2013)

- Choice also based on results of related work (Khan et al. 2015)
  - 16 trained linguistics students rated relative creakiness of phrase-final word 'bows' extracted from the Rainbow Passage
  - Crosslinguistic acoustic cues for creak (H1-H2, H1-A1, H1-A3) were found *not* to be correlated with our students' creakiness ratings
  - Creaky voice in American English, at least, seems to be cued by a more complex array of acoustic features

# The data: overall patterns

- **Wide range across speakers** in use of creak
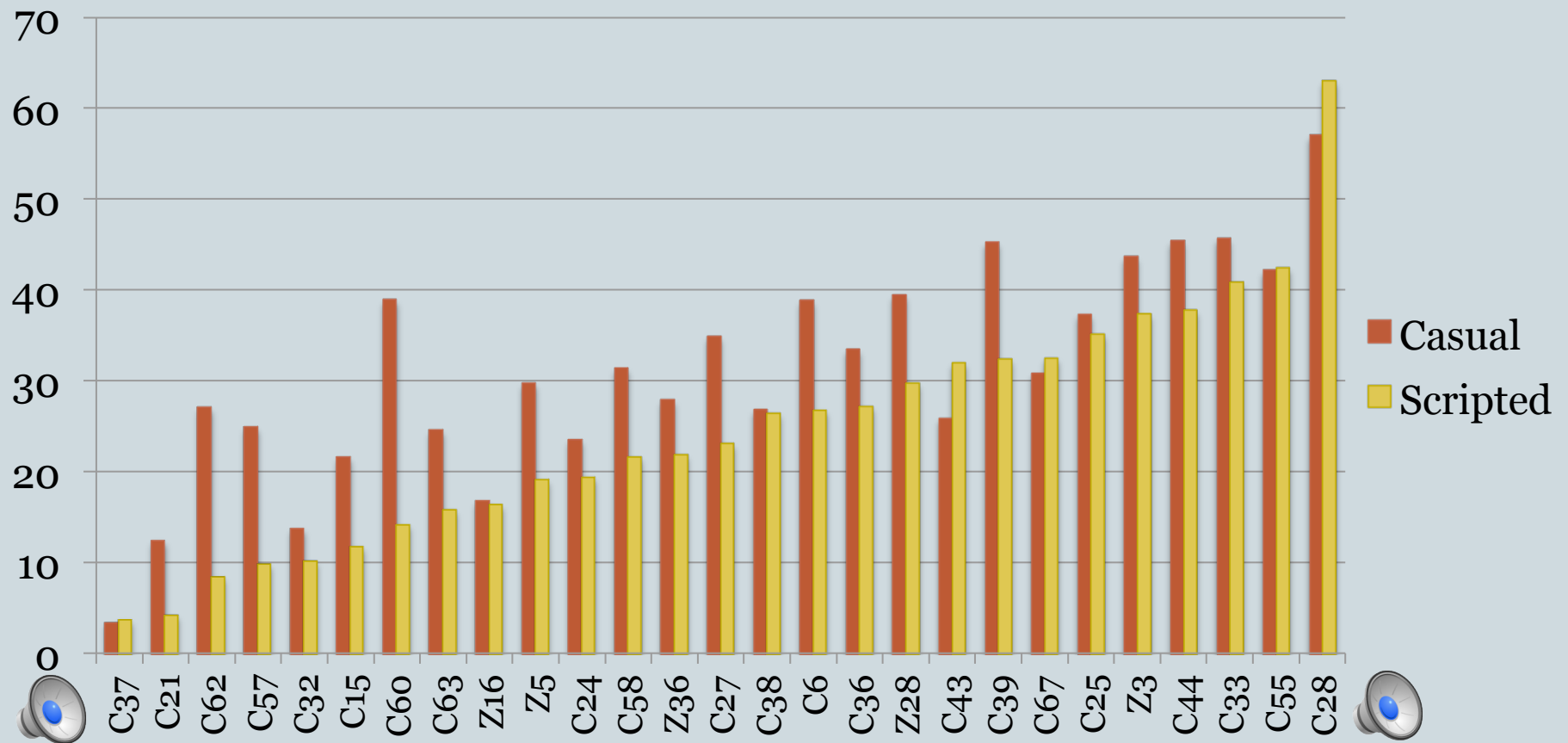
# The data: overall patterns

| | Female | Male | Non-Binary | total |
|---|---|---|---|---|
| AMAB | 26% | 26% | 27% | 26% |
| AFAB | 38% | 35% | 22% | 37% |
| AFAB+T | n/a | 23% | 23% | 23% |
| total | 35% | 26% | 29% | |

# Modeling

- We ran a **mixed-model logistic regression** on individual vowels
  - Response: Voice quality (creak is the application value)
  - Predictors:

Internal factors
- Word (random)
- Vowel quality
- Stress (primary, secondary, none)
- Pitch accented (yes, no)
- Position in IP (final, non-final)
- IP bndry tone (LL, LH, HH, HL)
- IP-initial vowel (yes, no)
- Style (casual, reading)

Social factors
- Speaker (random)
- Year of birth (continuous)
- Gender id (F, M, non-binary)
- Sex (AFAB, AFAB+T, AMAB)
- Sexual orientation (asexual, bi, gay, queer, straight)

# Results: Internal factors

- All internal factors selected were in line with previous literature

| Factor | *p* value | Level | | *n* | Proportion of vowels that are creaky | Factor weight |
|---|---|---|---|---|---|---|
| IP boundary tone | p < .001 | ... | | | | |
| Position in IP | p < .001 | ... | | | | |
| IP-initial vowel | p < .001 | ... | | | | |
| Vowel quality | p < .001 | ... | | | | |
| Stress | p = .00161 | ... | | | | |
| Style | p < .001 | Casual | 0.248 | 13788 | .31 | .562 |
| | | Reading | -0.248 | 7054 | .25 | .438 |

# Results: Social factors

- The social factors show a more complicated picture
  - Gender identity, sexual orientation, and age are NOT predictors of creak as a main effect
  - **Sex is the only social predictor of creak**

| Factor | *p* value | Level | | *n* | Proportion of vowels that are creaky | Factor weight |
|--------|-----------|-------|------|------|-----------------------------|---------------|
| Sex | p = .0419 | AFAB | 0.492 | 7126 | .37 | .621 |
| | | AMAB | -0.239 | 9230 | .26 | .441 |
| | | AFAB + T | -0.254 | 4486 | .23 | .437 |

# Discussion

- We return to our original goals, specifically in how we tease apart various aspects of sex and gender.
  - **Identity**: self-reported gender identity
  - **Socialization**: sex assignment at birth
  - **Laryngeal physiology**: exposure to testosterone
- We've determined that **gender identity does not predict use of creak**

# Discussion

- So should we just replace "gender" with "sex assignment at birth"?

- Not exactly. **Sex assignment at birth alone does not predict creak either.**

- Speakers assigned female at birth fall into two categories with respect to use of creak:

  - AFAB speakers (not on T) favor use of creak

  - AFAB+T speakers disfavor use of creak, like AMAB speakers

# Discussion

- Ah! So then is it the physiological aspect of sex?
- **Laryngeal physiology is the common trait here.**
  - AFAB speakers not on T favor creak
  - AMAB and AFAB+T speakers disfavor creak
- Helps us group cis men and trans men on T (less creak) apart from trans men not on T (more creak).

# Discussion

- One possible interpretation:
  - Men are presumably motivated to sound more masculine
  - Cis men and trans men on T achieve this through laryngeal changes from testosterone exposure
  - Trans men not on T may utilize creak as an alternative

- However, this account cannot explain why cis women use creak at such a high rate!
  - We do not assume that all people, regardless of gender or sex, are motivated to sound more masculine
  - Thus, **this cannot be the end of the story**

# Conclusions

- Our study complicates our view of gender and creak
  - **Wider range** of sex/gender categories
  - Explicitly tease apart separate influences of **identity**, **socialization**, and **physiology**
- **Laryngeal physiology was the best predictor** of creak use, not gender identity or assignment at birth
- We're currently working to further complicate this finding with additional data in our sample
- We invite your input and suggestions

# Acknowledgments

- This project was funded by Reed College's Stillman Drake Fund and Summer Scholarship Fund.

- Many thanks to our speakers, our tireless RAs (pictured below), and to you at Macalester College!

# References

**Beckman, Mary; Ayers Elam, Gayle. 1997**. Guidelines for ToBI labeling, Version 3. Ohio State University ms.

**Henton, Caroline; Bladon, Anthony. 1988**. Creak as a sociophonetic marker. In Hyman, Larry; Li, Charles N. (eds.) *Language, Speech, and Mind*. Longon: Routledge, pp 3-29.

**Khan, Sameer ud Dowla; Becker, Kara; Zimman, Lal. 2015**. Acoustic correlates of creaky voice in English. Talk presented at *the 170th Meeting of the Acoustical Society of America*, Jacksonville.

**Mendoza-Denton, Norma. 2007**. Creaky voice in gang girl narratives. Presented at the Annual Meetings of the American Anthropological Association, Washington, DC.

**Mendoza-Denton, Norma. 2011**. The semiotic hitchhiker's guide to creaky voice: Circulation and gendered hardcore in a Chicana/o gang persona. *Journal of Linguistic Anthropology* 21 (2): 261-280.

**Podesva, Robert J. 2007**. Phonation type as a stylistic variable: The use of falsetto in constructing a persona. *Journal of Sociolinguistics* 11: 478-504.

**Podesva, Robert J. 2013**. Gender and the social meaning of non-modal phonation types. *Proceedings of the 37th Annual Meeting of the Berkeley Linguistics Society* 427-448.

**Rosenfelder, Ingrid; Fruehwald, Joe; Evanini, Keelan; Yuan, Jiahong. 2011**. FAVE (Forced Alignment and Vowel Extraction) Program Suite. http://fave.ling.upenn.edu.

**Stuart-Smith, Jane. 1999**. Voice quality in Glaswegian. *Proceedings of the International Congress of Phonetic Sciences 14*: 2553-2556.

**Yuasa, Ikuko Patricia. 2010.** Creaky voice: A new feminine voice quality for young urban-oriented upwardly mobile American women? *American Speech* 85: 315-337.

**Veilleux, Nanette; Shattuck-Hufnagel, Stefanie; Brugos, Alejna. 2006**. Transcribing Prosodic Structure of Spoken Utterances with ToBI. MIT OpenCourseWare. http://ocw.mit.edu

**Zimman, Lal. 2012.** Voices in transition: Testosterone, transmasculinity, and the gendered voice among female-to-male transgender people. PhD dissertation, University of Colorado Boulder.

**Zimman, Lal. 2013.** Hegemonic masculinity and the variability of gay-sounding speech: The perceived sexuality of transgender men. *Journal of Language & Sexuality* 2(1): 5-43.