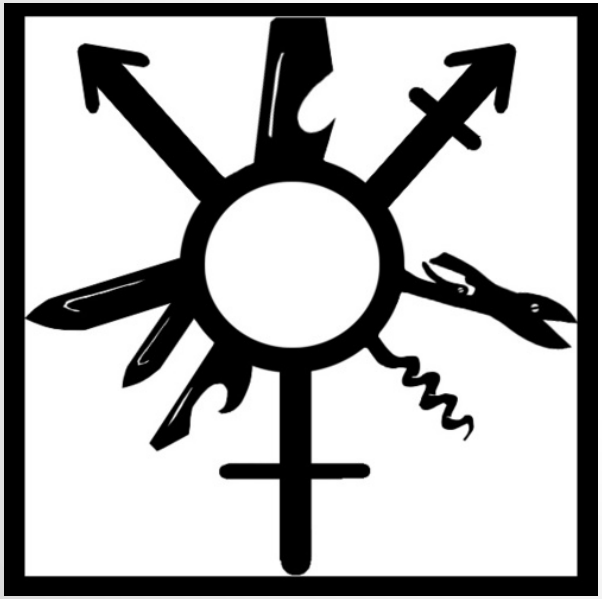
Creating Gender-Ambiguous Stimuli



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Why create gender-ambiguous stimuli?

- Perception work in gender is fairly sparse
- Most researchers alter one aspect of a recording (the aspect they're studying) and ask questions that "get at" gender (e.g. "how masculine does this person sound?" "how gay do they sound?")
- There are many, many acoustic considerations in sociophonetic work on gender

Example: Creak

- How can one isolate the social perceptions of creak?
  - Creak is easier to hear in higher-pitched voices, because a major feature of creak is widely-spaced glottal pulses
  - Gender-ambiguous audio stimuli can help researchers separate the acoustic realities from the social ones

Acoustic correlates of gender

- Pitch - the most salient aspect of gender
  - Seemingly biological
  - However, pre-pubescent children have exhibited differences in pitch, even though their bodies are not yet different enough to produce differences explained by biology (Sachs 1975)
  - On average, American women are between 200-220 Hz and men are between 100-120 Hz
  - Stereotype that women are more “swoopy” in their pitch; not borne out by real production data, but the stereotype affects perception of children’s voices as female (Bennett and Weinberg 1979)

Acoustic correlates of gender

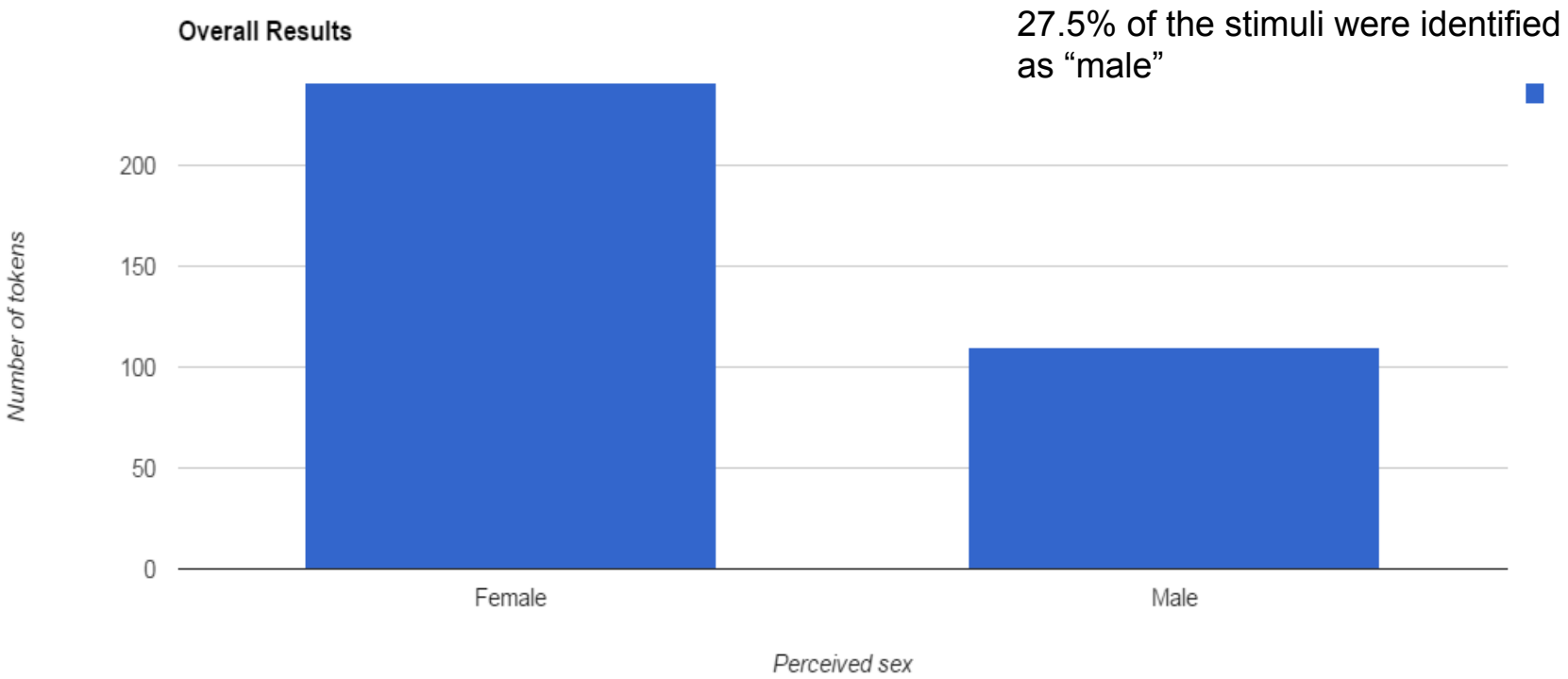
- Formant values
  - In general, men have lower formant values and women have higher ones -- in part explained by size of the vocal tract
  - Women also have more dispersed formant values
  - However, these too are exaggerated by children who are not significantly different physiologically -- as early as age four (Perry et al. 2000)
- Creak
  - In older research associated with men; associated with young women in current media and in recent research (except for mine)
- Sibilants
  - Fronted, higher frequency sibilants are associated with femininity (Flipsen, Shrilberg, Weismer, Karlsson & McSweeny 1999)

Methodology - Speakers

- Tall women, to address some of the acoustic considerations of sexual dimorphism, especially F2
- Not short men - their larynxes have descended and many of them sound the same as tall men
- Filler sentences from gender-normative speakers, two male and two female speakers between the ages of 22 and 33
- The speakers were asked to read sentences “naturally”
- Sentences were all taken from sociolinguistic interviews collected in Ann Arbor, MI
    - All sentences were said in sociolinguistic interviews with 1-2 syllables of utterance-final creak
    - However, the incidence of creak in this position was not consistent among speakers

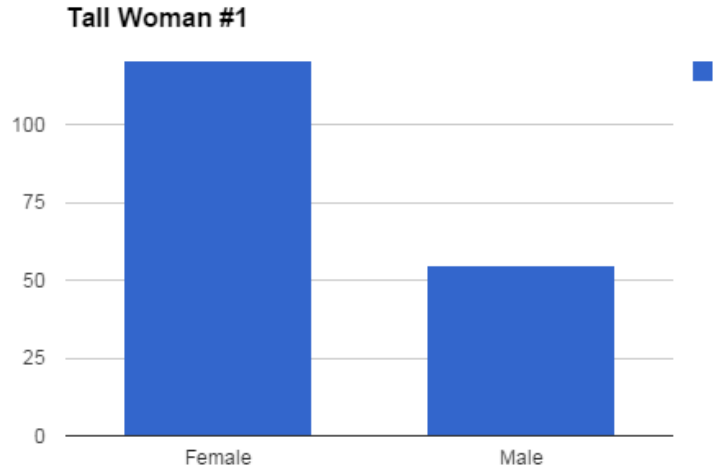
Methodology - Synthesis

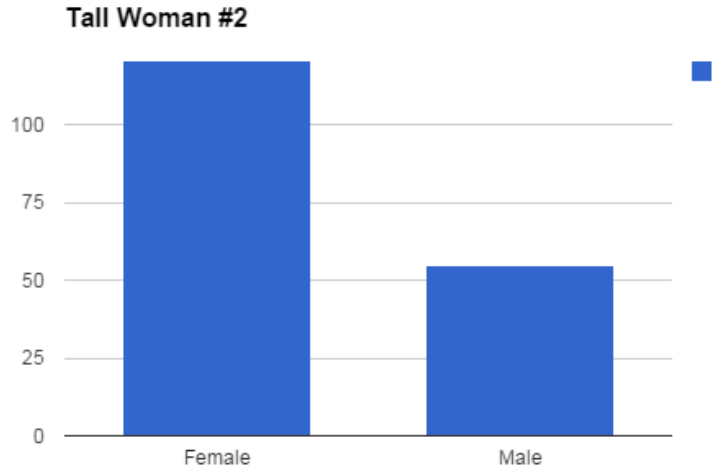
- Lowered the speakers' pitches down as far as I could without creating creak (one speaker was originally between 200 and 230 Hz, and one was between 170 and 190 Hz)
- Presented the audio stimuli to participants, along with more normative male and female voices (2 of each)



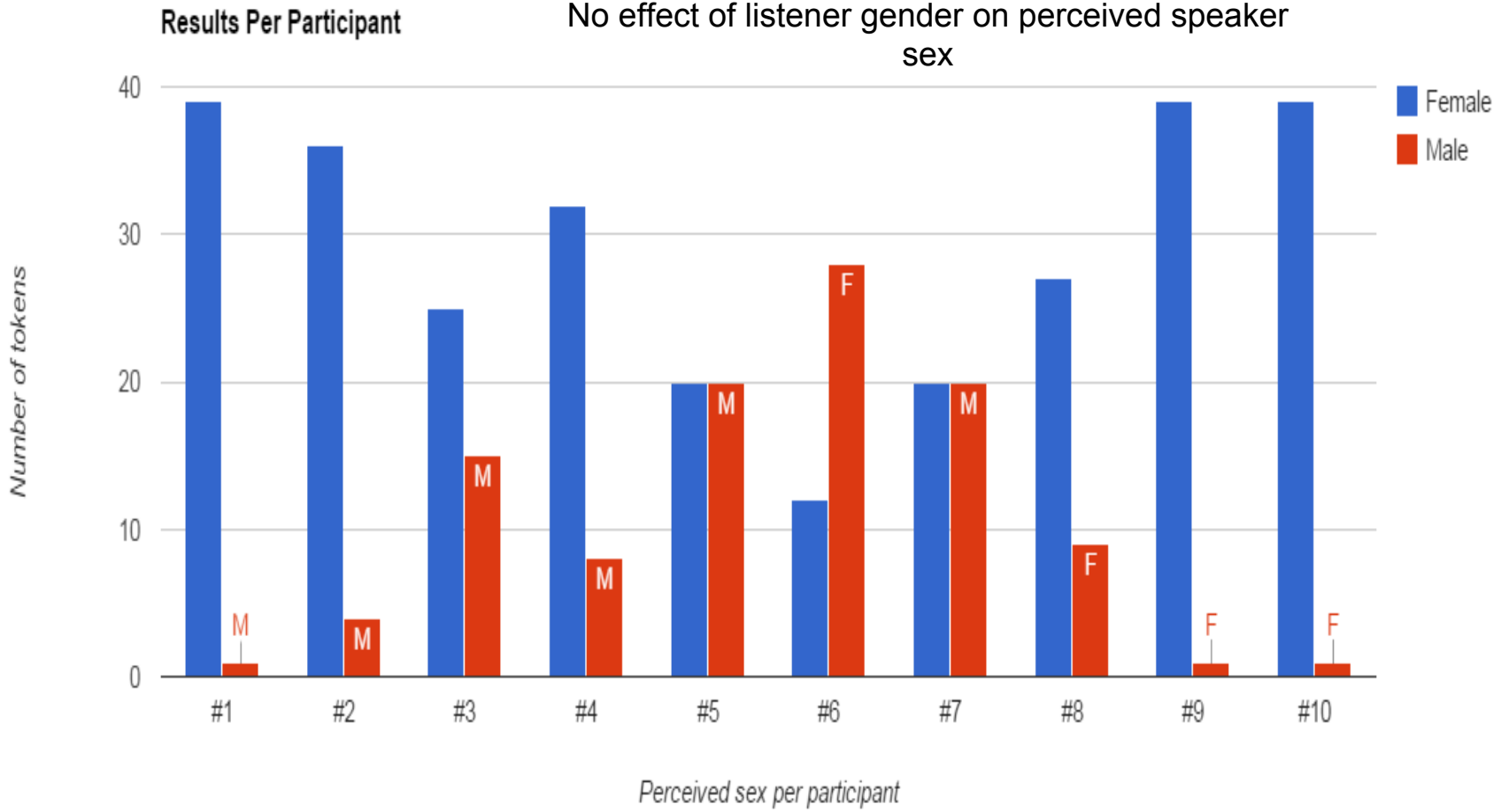
27.5% of the stimuli were identified as “male”

Stimuli from each speaker was rated identically… (145 female for Tall Woman #1, 145 female for Tall Woman #2)





No effect of listener gender on perceived speaker sex



Conclusion

- Although the two speakers altered to sound gender neutral still sounded female to many listeners, 27.5% of the stimuli were identified as male, meaning that many of the listeners were likely unsure of the gender of the speaker for the stimuli
  - If paired with visual stimuli (i.e. pictures), this ratio would likely be enough to convince listeners that they are listening to a male speaker or a female speaker
  - This type of stimulus will allow researchers to isolate linguistic variables to test for gender
  - It is methodologically possible to create gender-ambiguous stimuli and to use this stimuli for doing gender research in perception

Thank you!