

Exploring sociophonetic variation in creak and /s/ in transgender speakers

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Outline

1. Introduction

- Terminology
- Research question
- Background information
- Predictions

2. Methods

3. Results

- /s/
- Creaky voice

4. Discussion

- /s/
- Creaky voice
- /s/, creaky voice, and qualitative data

5. Conclusion

Terminology

Cisgender

Someone who identifies with the gender they were assigned at birth

Transgender

Someone who does not identify as the gender they were assigned at birth

Umbrella term, including non-binary individuals

Transmasculine

Assigned female at birth, now identifies as something else
(e.g. trans man, non-binary)

Transfeminine

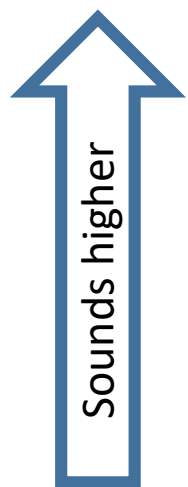
Assigned male at birth, now identifies as something else
(e.g. trans woman, non-binary)

Research question

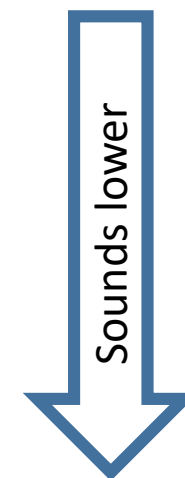
How do transgender speakers negotiate gender through speech and the voice?

- Focusing on two variables: creaky voice, /s/
- Studying trans speech can give insight into the factors that contribute to gender variation in speech more generally (see work by Zimman)

The variables – /s/ as in *sun*, *sand*





- Fronted /s/
- More typical of women or stereotypically feminine speech
- Higher centre of gravity



- Retracted /s/
- More typical of men or stereotypically masculine speech
- Lower centre of gravity

Predictions - /s/

- Assumption: Trans speakers may attempt to distance themselves from typical /s/ of their assigned sex
 - Cisgender female speakers tend to have higher COG
 - Cisgender male speakers tend to have lower COG
- Predictions:
 - Transfeminine speakers may have a higher centre of gravity 
 - Transmasculine speakers may have lower centre of gravity 
- Other factors

The variables – creaky voice



- A type of voice quality with irregular vocal fold vibration and low pitch
- In the UK among cisgender speakers: men are creakier than women
- But this isn't the case everywhere (see e.g. Yuasa 2010, Szakay & Torgersen 2015)

Predictions – creaky voice

- Among cisgender speakers in UK, men tend to be creakier than women
- Creak is also low pitch – pitch difference are a main difference between cis male and female speakers
- Trans speakers may attempt to distance themselves from their assigned sex
 - Transmasculine speakers may use high amounts of creak
 - Transfeminine speakers may use low amount of creak
- Other factors may also contribute

Methods - Participants

Participant Pseudonym	Self-identified Gender	Pronouns	Place of origin
Jam	Non-binary - no specific gender	They/them	Edinburgh
Ruairi	Between non-binary and male	They/them	Edinburgh
Ray	Floats between non-binary and male, transmasculine	They/them	Glasgow
Marco	Non-binary, transmasc, genderqueer	He/him	Scottish Borders
Aesclepi	Female	She/her	London
Batman	Male	He/him	West Scotland
Spicey boi	Non-binary, demiguy, agender, sometimes describe self as trans guy	He/him	West Scotland
Alex	Trans guy	He/him	South England
Rainbows of Doom	Non-binary/male	He/him	Scottish Borders
Robin	Non-binary - in the middle, towards masculine	They/them	North England
Jay	Non-binary	They/them	West Scotland
Hannah	More a girl than anything else - "girlwards of nothing"	She/her	North England
Alice Nonymous	Girl	She/her	South England
Isaac	Mostly a man	He/him	London
Cailean	Agender, genderless	They/them	Glasgow
Napman	Non-binary, trans dude	He/him	South England
Julia	Genderfluid, between female and non-binary	She/her	West Scotland

Gender category: Transfeminine Transmasculine

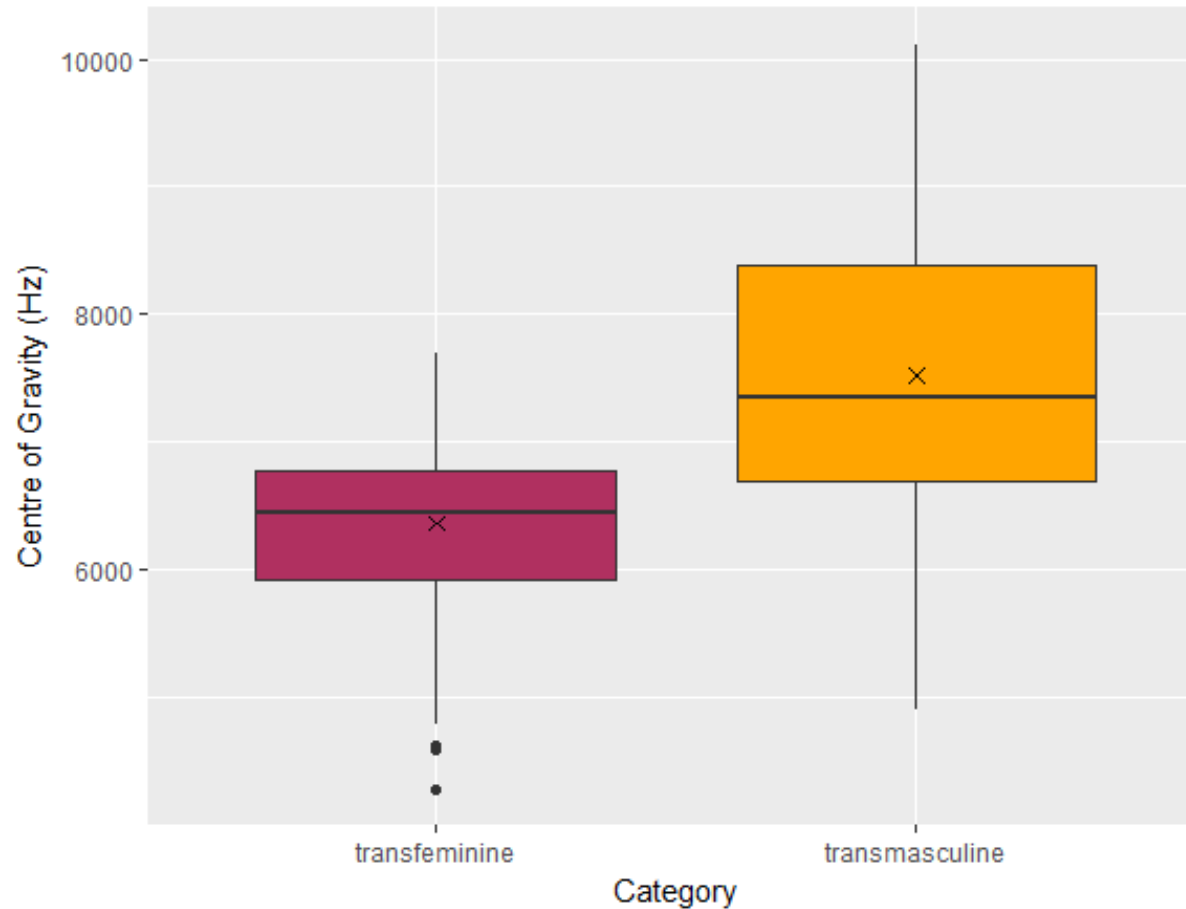
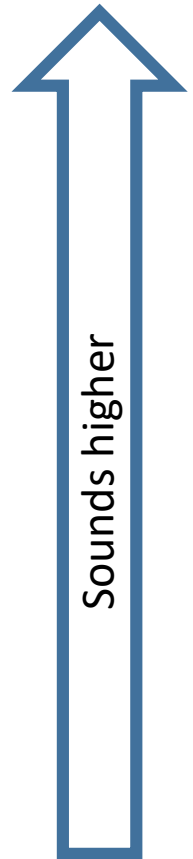
Methods - Materials and interview procedure

- /s/ - word list
- Creaky voice – list of Harvard sentences
- Interview discussing gender identity, trans experience, and relationship to speech & voice
- Questionnaire

Methods - Analysis

- /s/ - Multiple linear regression analysis in R
 - centre of gravity for /s/
 - speaker gender category (transmasculine or transfeminine)
 - position in word (initial, medial, final)
 - Preceding and following vowel (/i/ or other)
- Creaky voice – Multiple logistic regression analysis in R
 - voice quality for each vowel (creaky or non creaky)
 - following sound (glottal stop or other)
 - syllable position (number of syllables away from the final syllable in the utterance)
 - speaker gender category (transmasculine or transfeminine)

Results - /s/



Centre of gravity by gender category

Prediction:

Transfeminine speakers may have a higher centre of gravity



Transmasculine speakers may have lower centre of gravity

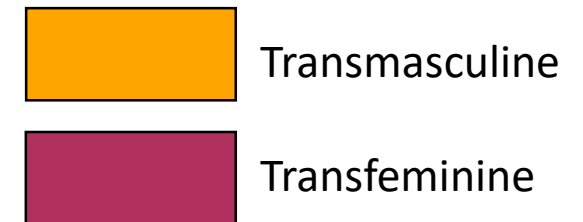


Results:

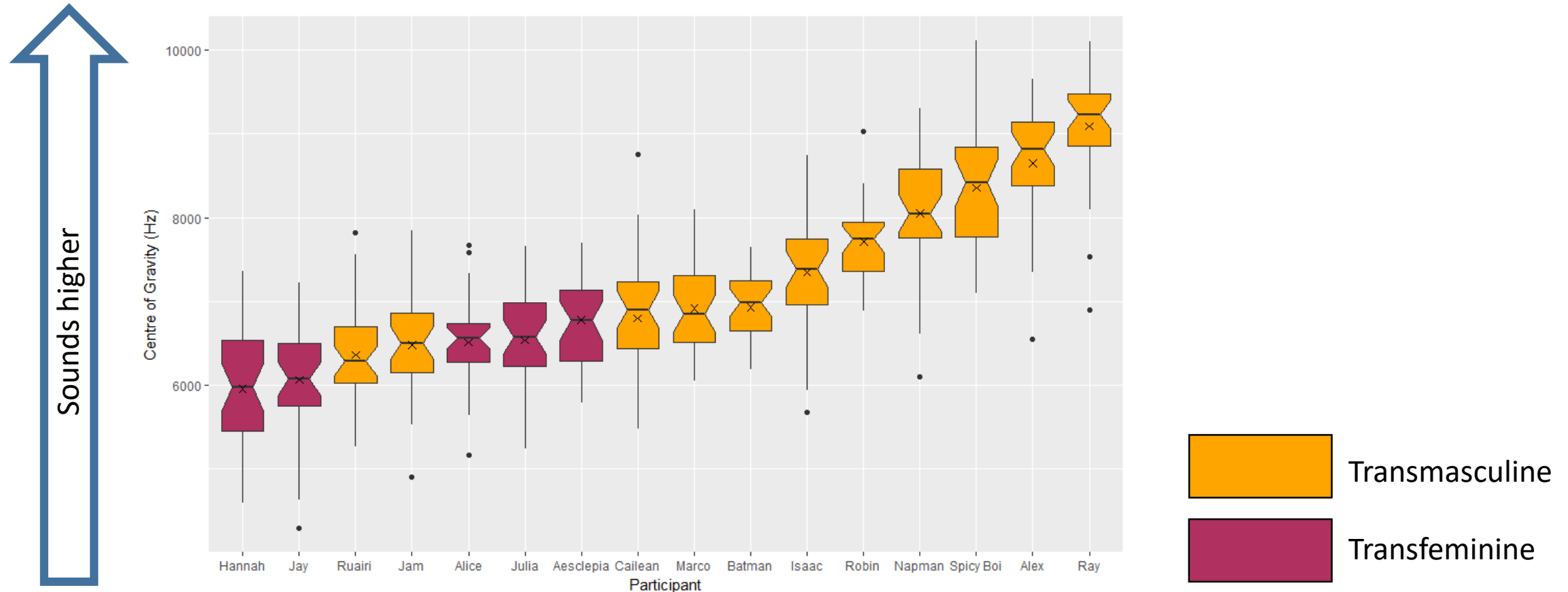
Transfeminine speakers had a lower centre of gravity



Transmasculine speakers had a higher centre of gravity

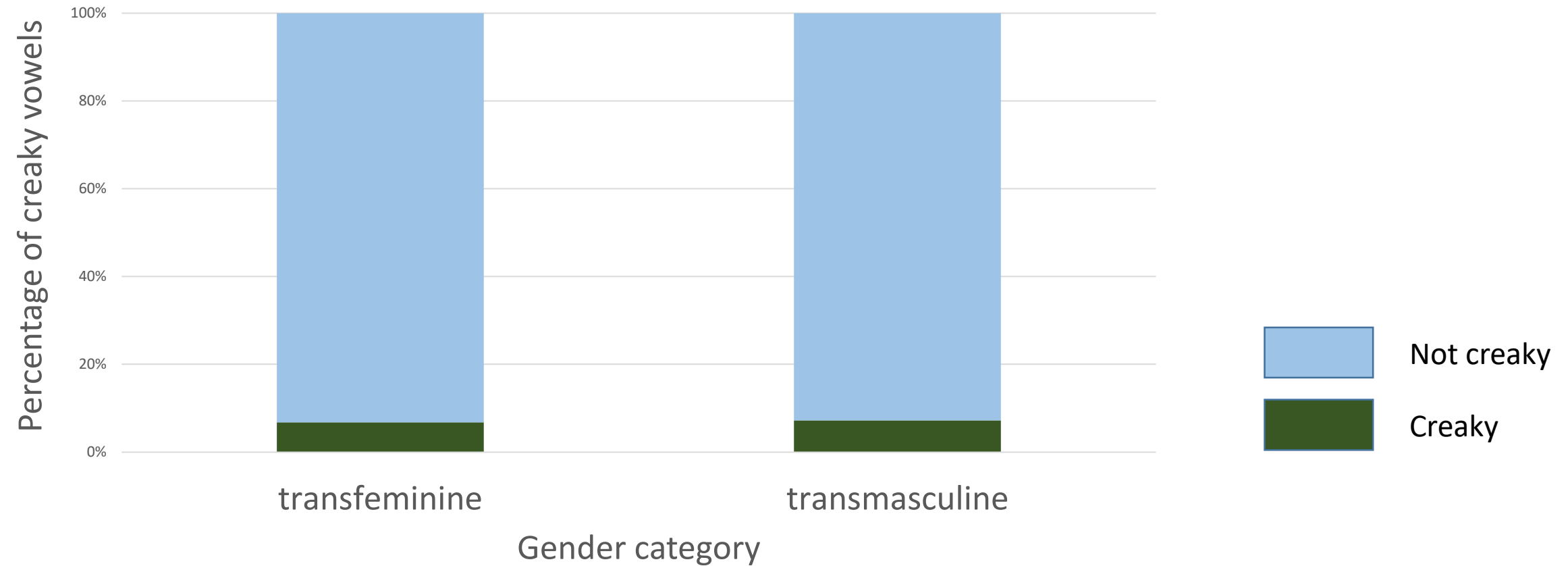


Results - /s/

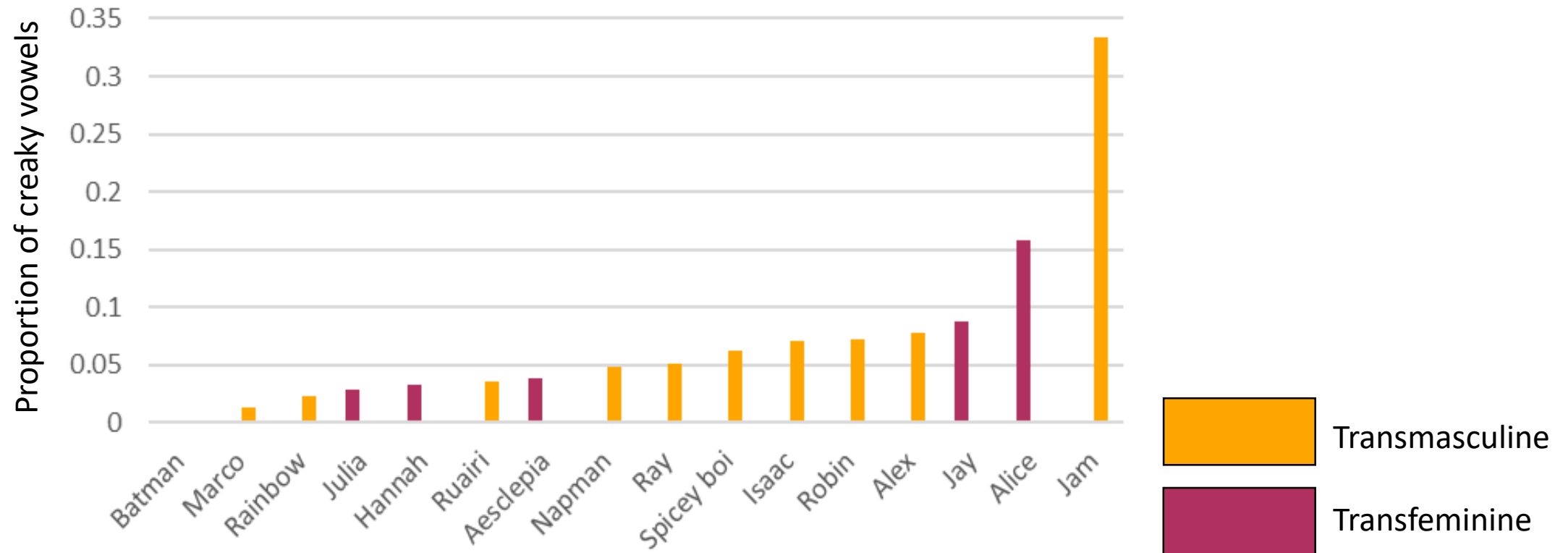


Centre of gravity by participant

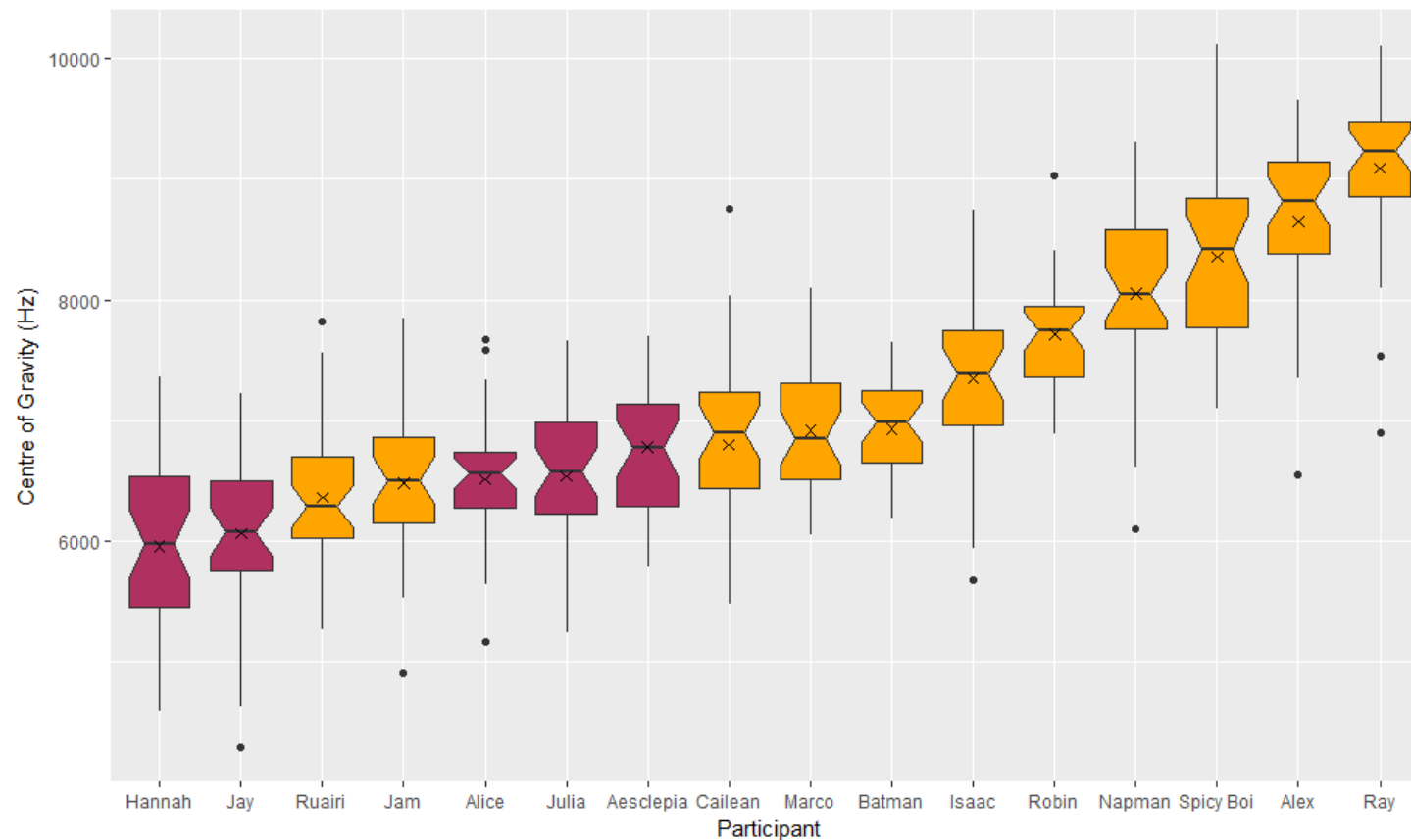
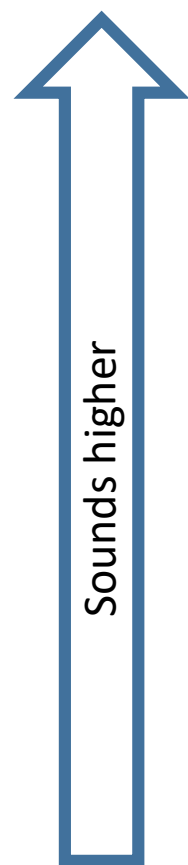
Results – creaky voice



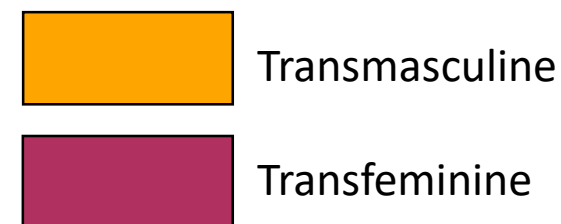
Results – creaky voice



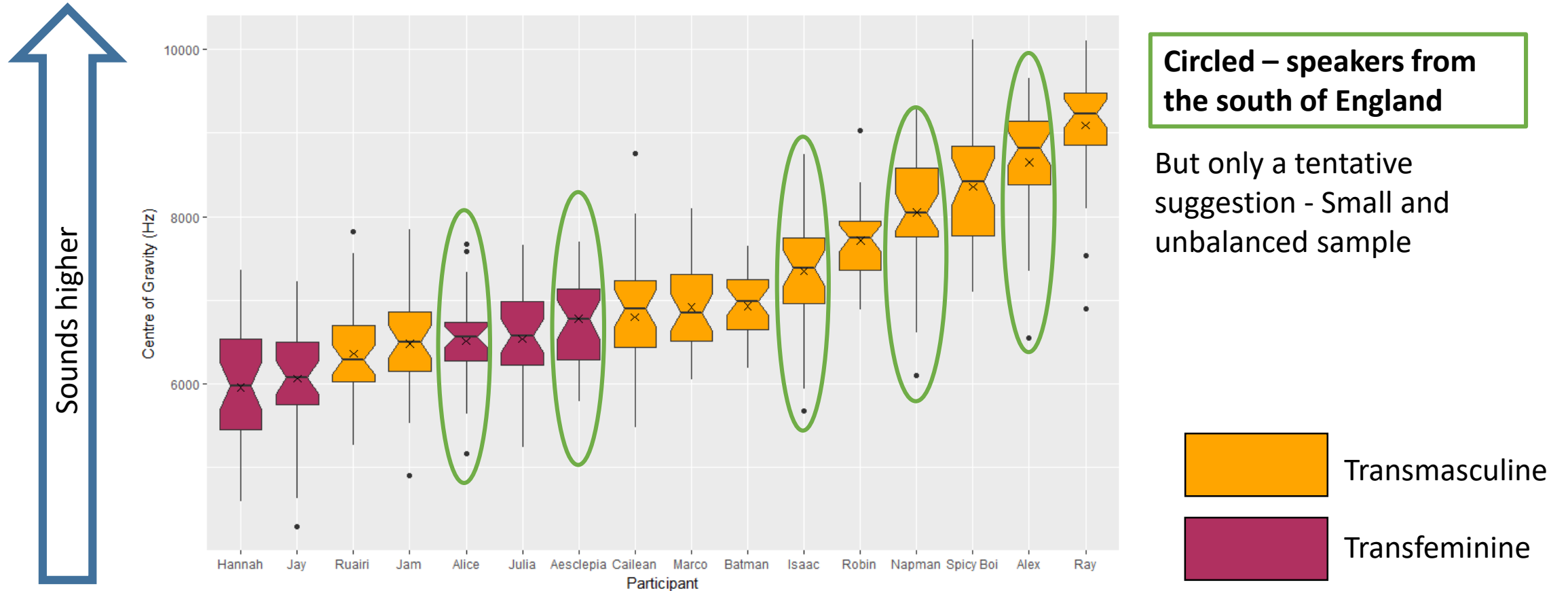
Discussion - /s/ - Physiology?



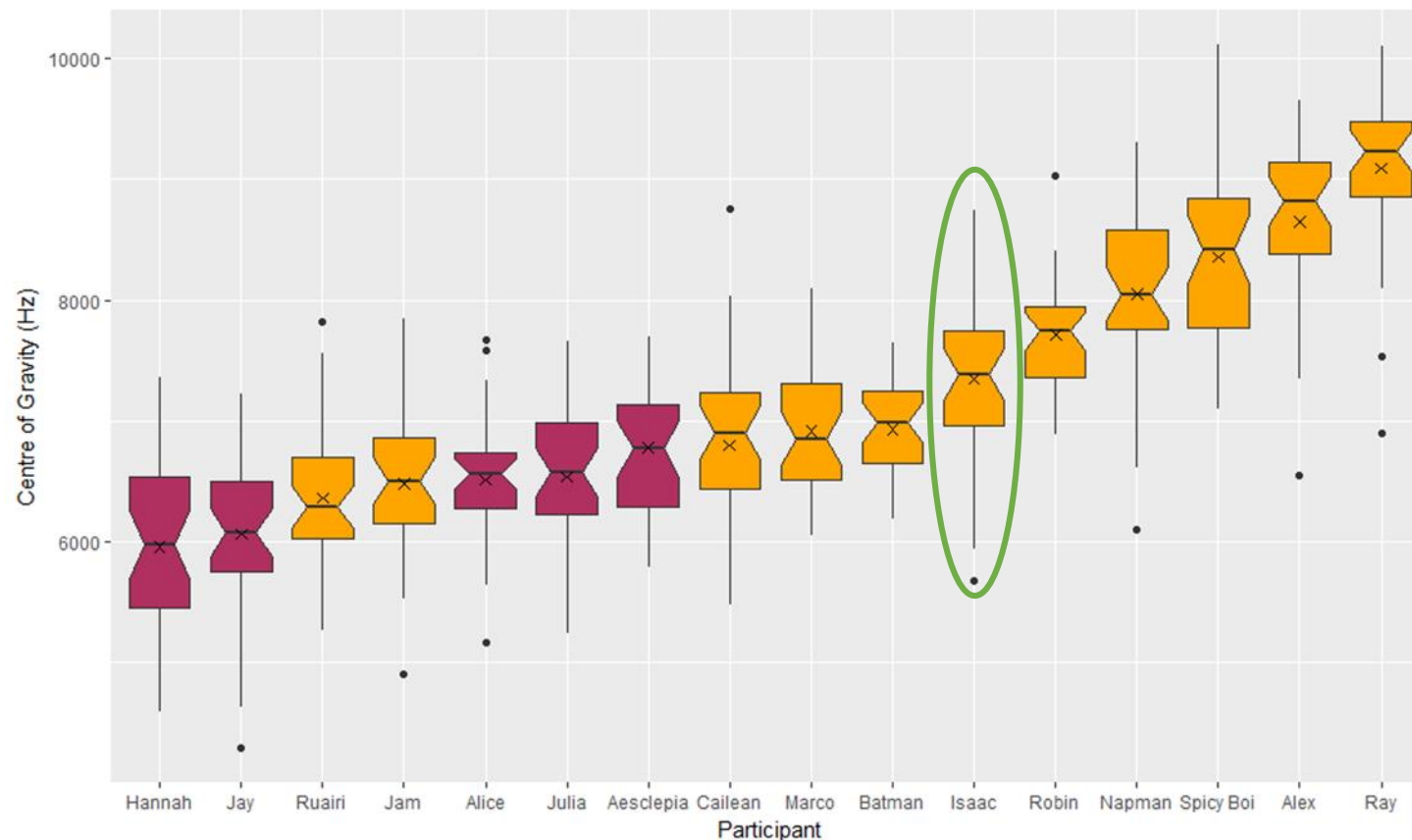
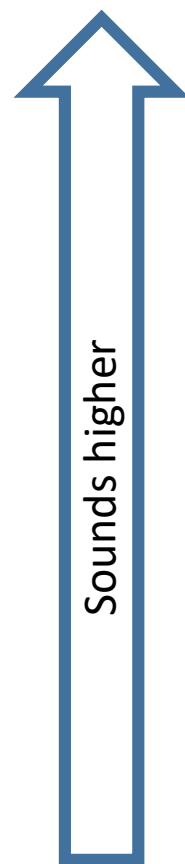
- May be a factor, but not studied directly so difficult to determine it's influence



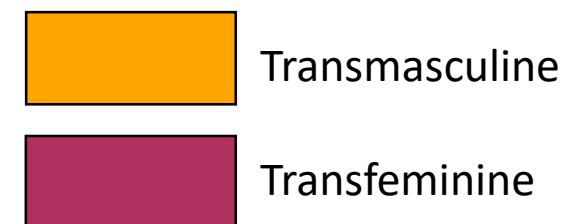
Discussion - /s/ - Accent?



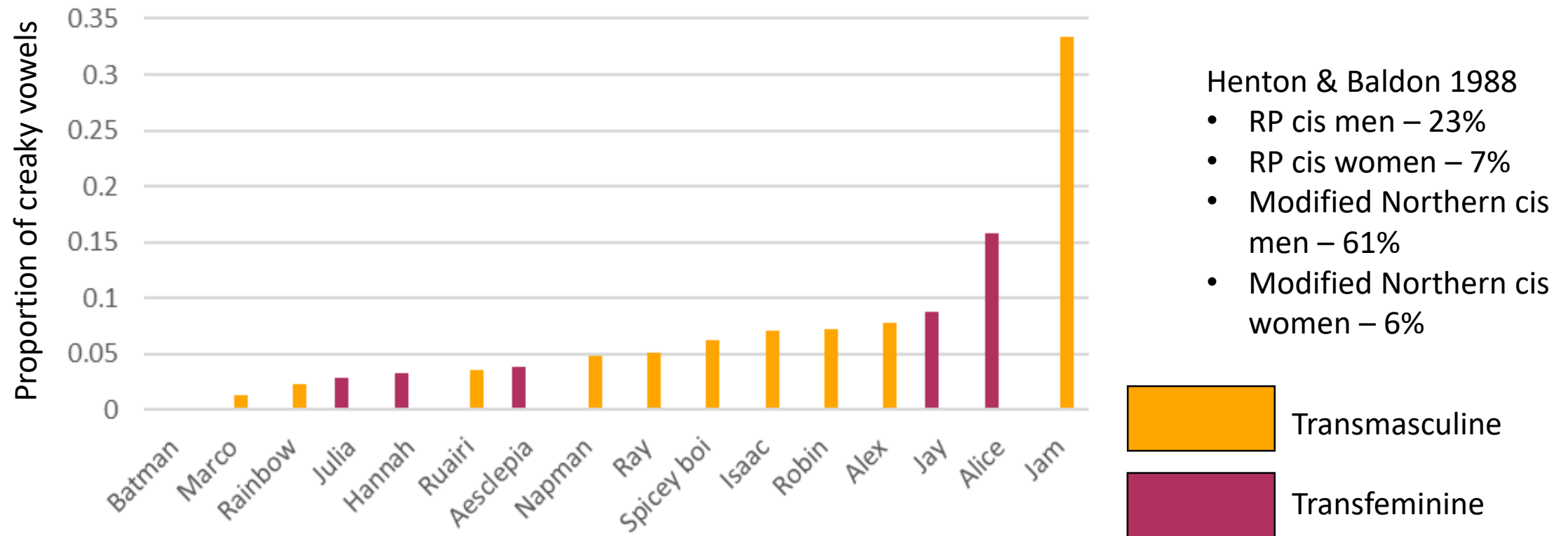
Discussion - /s/ - LGB+ & non-binary identity?



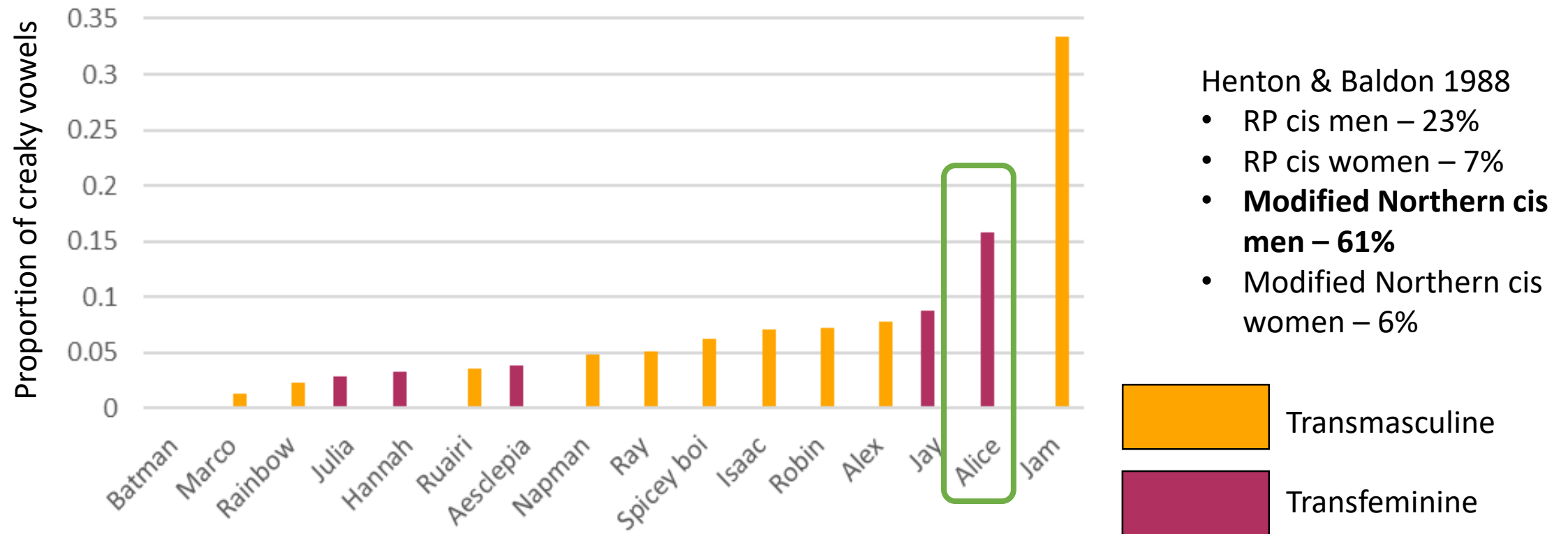
- All participants identified as LGB+ in some way outside of their trans identity
- Many participants were non-binary
- But no clear relationship



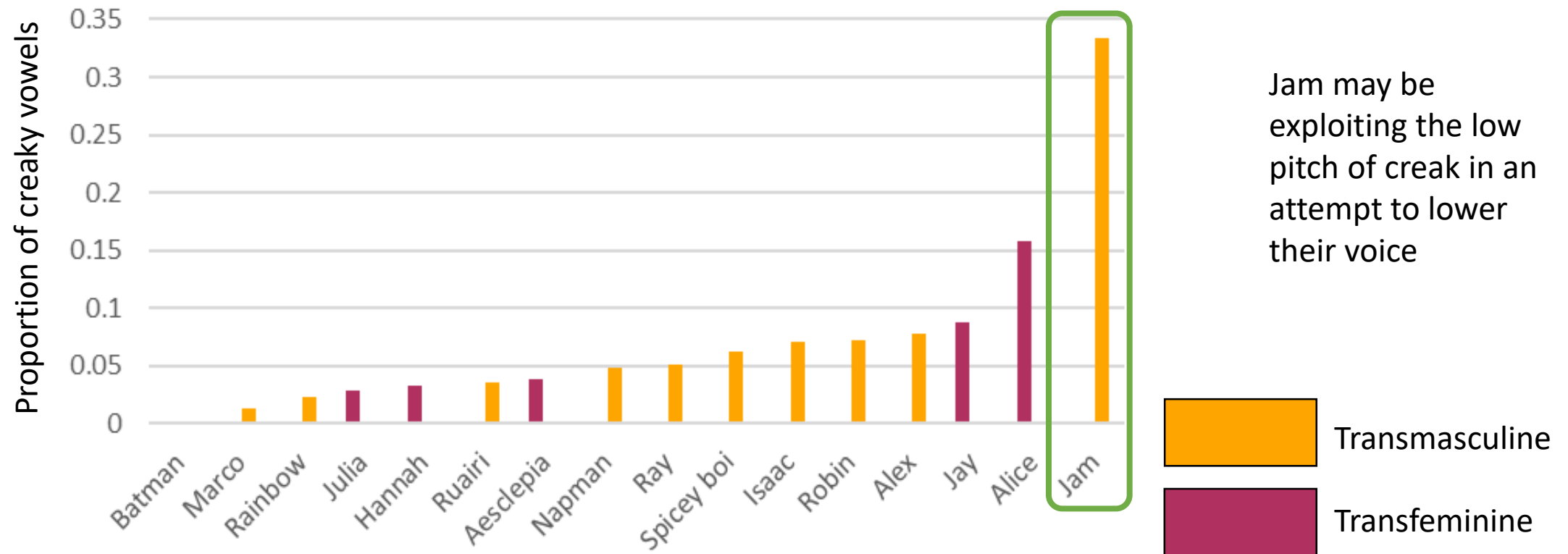
Discussion – Creaky voice - Identity



Discussion – Creaky voice – Identity & Accent



Discussion – Creaky voice – Identity



Transgender speakers and style

- Social meaning in variation comes when different linguistic resources are considered together in a wider context
- Qualitative data - discussion on participants' gender presentation, coming out, sexuality, relationship with their voices...

Language socialisation experience

Ray (Transmasculine)

- 'Floats between non-binary and male'
- Only came to identify as trans during adolescence
- Went to a single-sex girl's school & was not around many men growing up
- Spoke about how this made it difficult for them to aim towards a masculine speech style
- Highest mean COG for /s/ (9034 Hz)
- Low-average creak usage (5%)

Current environment

Spicey Boi (Transmasculine)

- Non-binary, demiguy, agender, sometimes describe self as trans guy
- ‘When it comes to gender presentation, I feel like I want to present as more masculine, but [...] **I feel like I can’t present as masculine** as I feel like I should be presenting’
- ‘I’ve noticed that when I speak to customers, and they don’t know I’m trans, I’ll up my voice and try and sound more feminine [...] **I do it to be safe**’
- Relatively high mean COG for /s/ (8359Hz)
- Average creak (6%)

Interaction of socialisation & environment

Aesclepiea (Transfeminine)

- Female
- 'I don't think that my speech is particularly masculine'
- But also spoke about trying to make her voice sound more masculine when she was at school to avoid being bullied
- Low creak (4%)
- Mean COG for /s/ of 6777 Hz

Wider linguistic style

Participants remarked on pitch, lexicon, intonation, speech rate, and loudness

Alex (Transmasculine)

- Trans man
- High mean COG of 8649 Hz
- Creak in 8% of vowels
- But despite not being on testosterone, low f_0 of 130-160 Hz, well below the typical range for cisgender female speakers

Conclusion

- No single factor determines creak use or /s/ COG in trans speech
- But speakers' identities, socialization, and current environments interact to produce variation
- Wider range of variables would allow us to gain a more complete picture of trans speakers' linguistic practices

Thanks for listening!

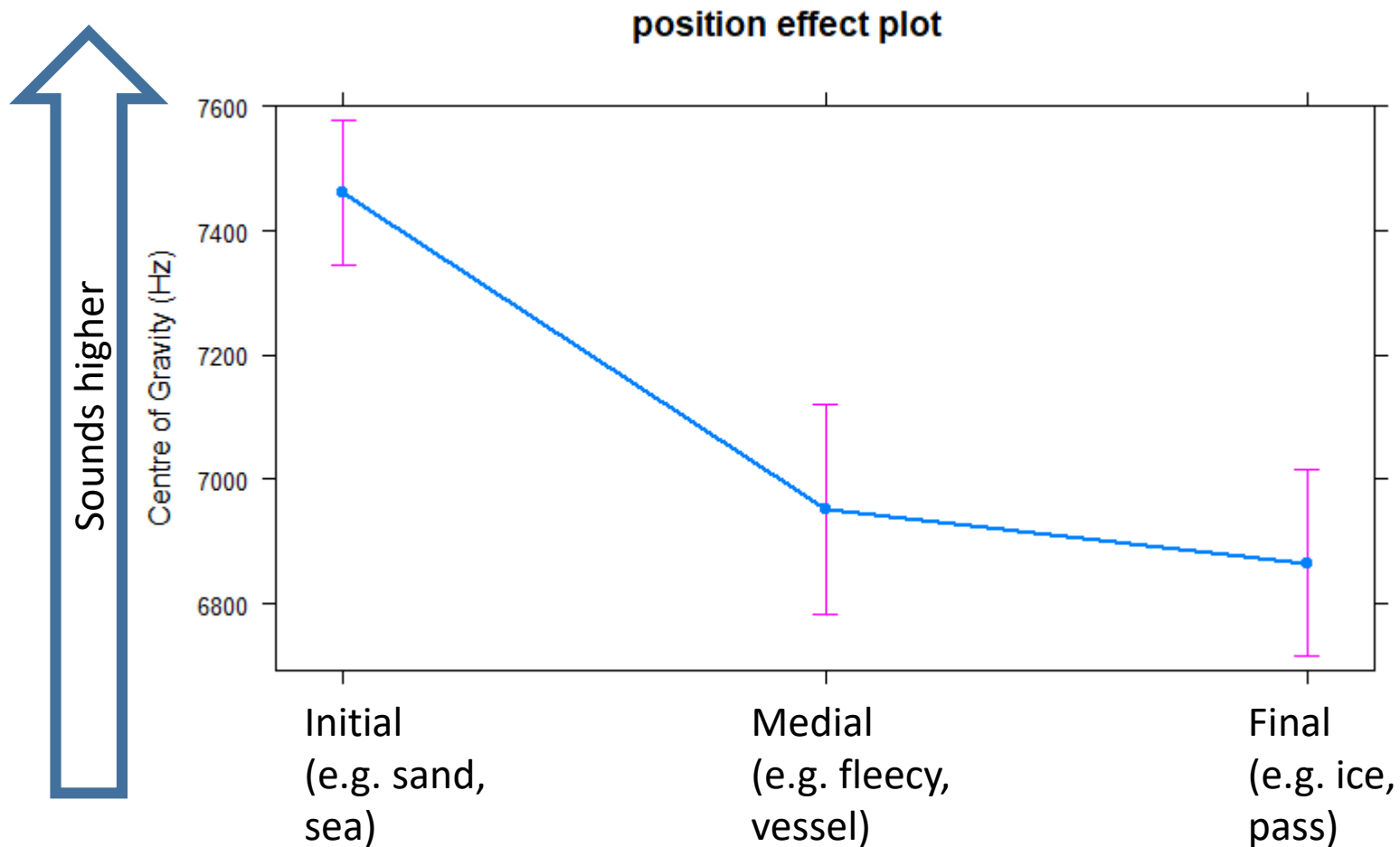
- Questions?

Contact information:

Jo Pearce

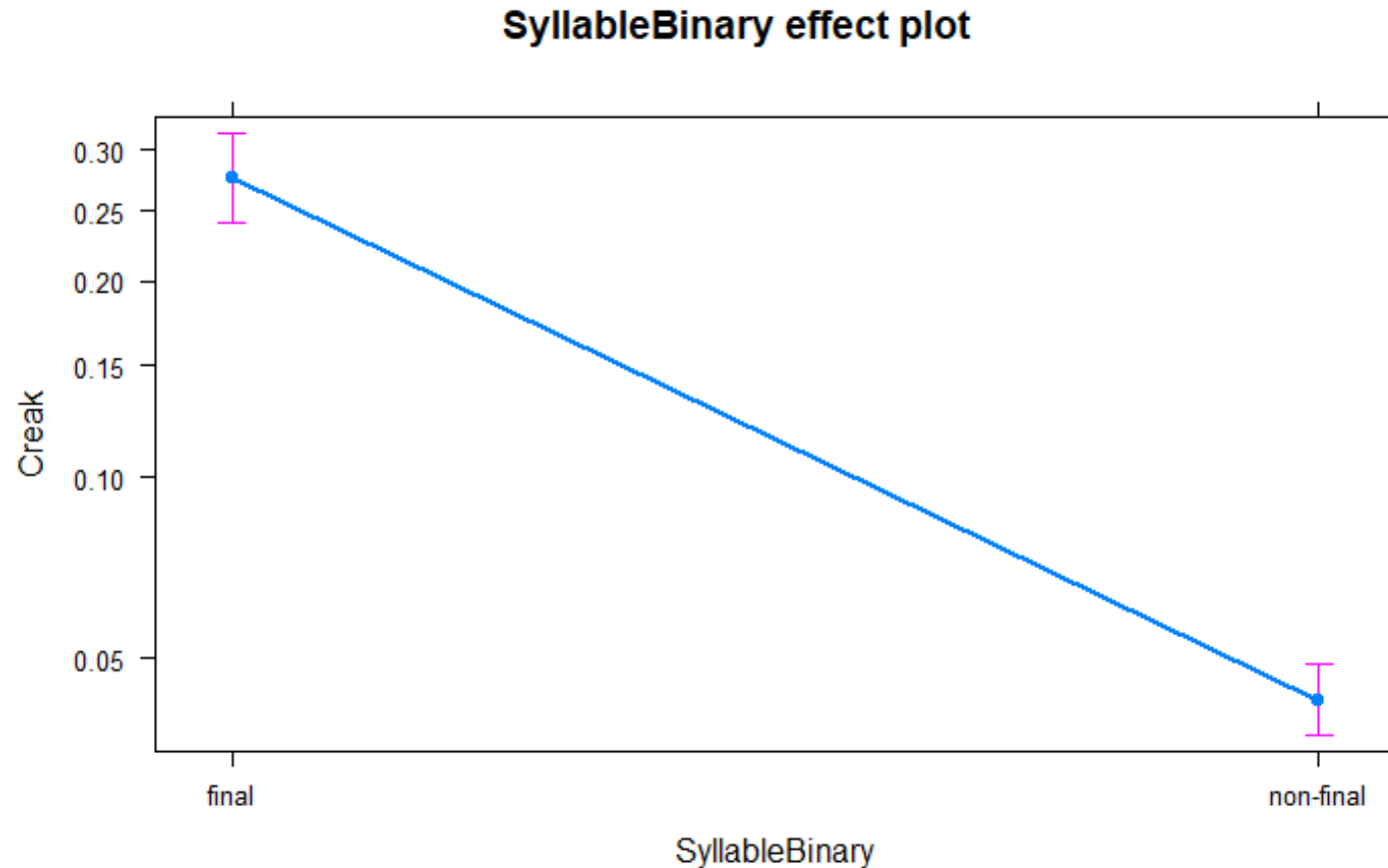
j.pearce.1@research.gla.ac.uk

Results - /s/- linguistic factors



- Word-initial onset of a stressed syllable – higher COG
- No effect of context of /i/ (e.g. *sea*)

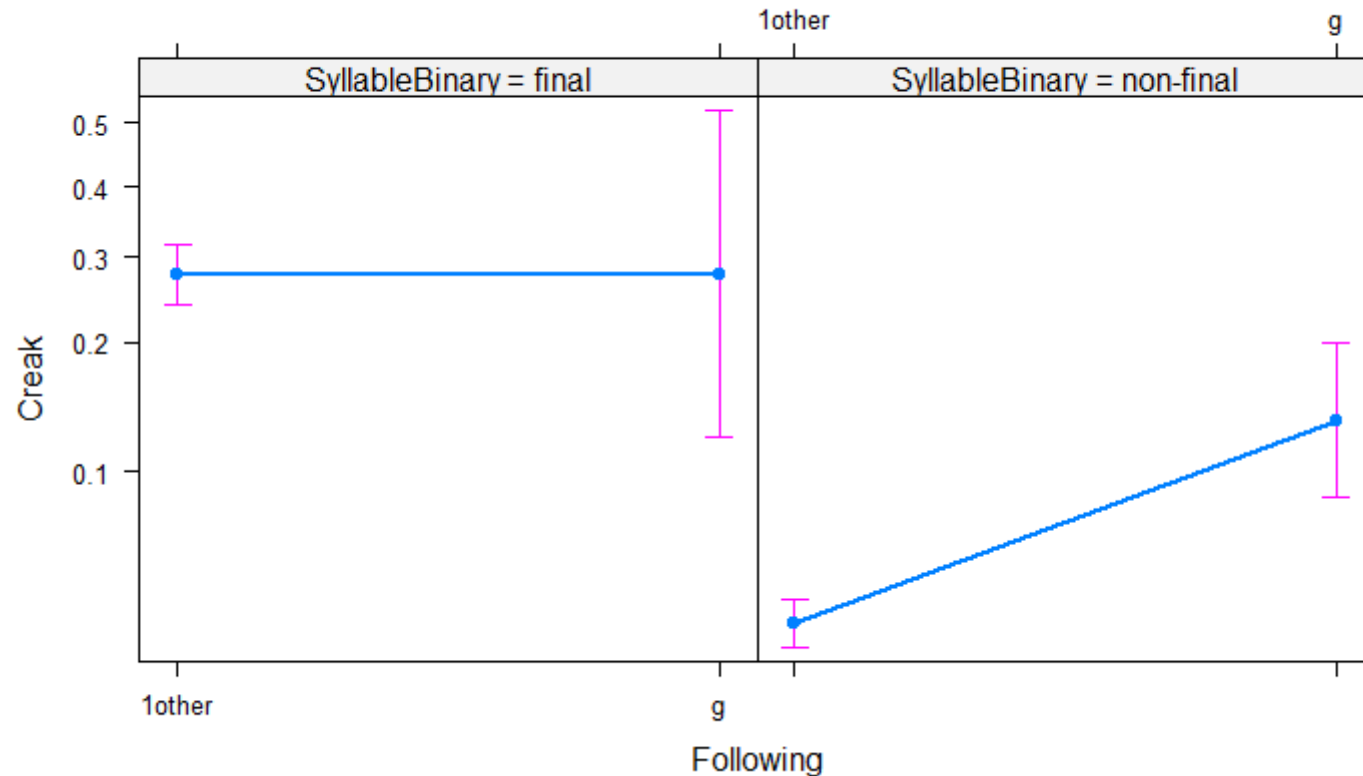
Results – creaky voice – linguistic factors



The lease ran out in sixteen weeks

Results – creaky voice – linguistic factors

Following*SyllableBinary effect plot



The lease ran out in sixteen weeks
Mend the coat before you go out

Creaky voice – more info on methods

- Forced alignment using Montreal Forced Aligner (McAuliffe et al. 2017) using the DARLA web interface (Reddy & Stanford 2015)
- Kane et al.'s (2013) creak detection algorithm to automatically detect creaky portions
 - Only detects 81% of auditorily coded creak
- Read speech
 - Creaky voice is less common in read speech than in spontaneous speech