

# Complementary pre-lateral mergers across ethnicities and generations in Georgia

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2025 American Dialect Society Conference

Philadelphia, PA • January 11, 2025

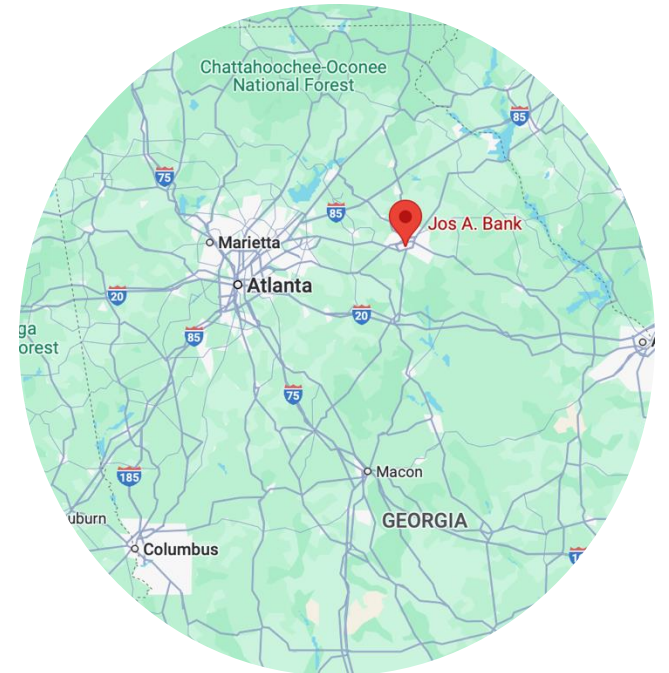


# Regional variation is real (or [ɹɪʔ])



*Athens, Georgia, 2014*

- Salesman: “Okay sir, what’s your name?”
- Customer: “John [heɪʔ]”
- Salesman: “[heɪəʔ]!  
You don’t raise much of that, do ya?” 🔥
- Customer: 😬



# Pre-lateral mergers in English

- Vowel quality before /l/ can diverge compared to other contexts
  - “Mergers” include *feel-fill*, *fail-fell*, *pull-pool*, *bull-bowl* (USA), *hull-hole* (UK, USA), *gulf-golf* (Aus), *doll-dole* (UK, Aus, NZE)
  - Changes are triggered by velarization of syllable-final /l/ to [ɫ], or /l/-vocalization, affecting formants of preceding vowels via coarticulation
- Pre-lateral vowels are understudied, due to their variation
  - Most acoustic studies exclude pre-sonorant vowels, focusing on “plain” contexts less affected by anticipatory coarticulation

# Pre-lateral front vowel mergers in the USA

- /iI/ vs. /ɪI/
  - Oklahoma and Texas: pre-lateral /i/ laxes toward [ɪ] over apparent time (Bailey et al. 1993, Tillery 1997); merger in far western Pennsylvania (Thomas 2001, speaker 12)
  - /iI ɪI/ can merge in Stage 3 of Southern Vowel Shift (Labov et al. 2006); FEEL/FILL can both be realized with [iə] or [ɪ] in rural White Southern speech (Thomas 2005)
- /eI/ vs. /ɛI/
  - Laxing of /e/ toward /ɛ/ in OK, TX (Bailey et al., 1996, Tillery 1997); merger in far western PA, central TX (Thomas 2001, speakers 12 & 135)
  - *ANAE* mentions /eɪ ɛ/ merger in the South, but no data (Labov et al. 2006); FAIL/FELL can both be realized as [ei] (older) or [ɛ] (younger) rural White Southerners (Thomas 2005)
- Among African American speakers
  - FAIL as [fɛəɫ] and FEEL as [fiəɫ], with possible /l/-vocalization (Bailey & Thomas 2021)
  - Gary, IN: /iI ɪI/ and /eI ɛI/ mergers only in AA speech (Gordon 2000)
  - TX: /iI ɪI/ merger (Thomas 2001, speakers 167, 169, 170)
- Southern/African American merger of tense and lax vowels emerges in speakers born 1900 – 1940 (Bailey & Thomas 2021)

# Feeling out research questions in Georgia

- How extensive are the FEEL-FELL and FAIL-FELL mergers?
- Do the mergers trend in parallel, or independently, over time?
- Among White speakers
  - The SVS in GA doesn't fully reach Stage 3, so /i/-laxing is unpredicted. Does the /il ɪ/ merger also fail to obtain?
  - The SVS has retreated among younger speakers (Renwick et al. 2023). Did the pre-lateral mergers also peak among older Georgians?
- Among African American speakers
  - The African American Vowel Shift is strongest among Gen X Georgians (Forrest et al. 2024). It includes peripheralization of /ɪ ɛ/ (Thomas 2007). Are the /il ɪ/ and /el ɛ/ mergers also most complete for those speakers?

## Data

(cf. Renwick et al. 2023)

Legacy interviews (LAGS)

Contemporary interviews (Atlanta, Roswell, Georgia Tech, CORAAL)

## Acoustic analysis

**transcription**

manual

**forced alignment**

Montreal Forced Aligner (McAuliffe et al. 2017)  
via DARLA (Reddy & Stanford 2015)

**formant extraction**

FAVE (Rosenfelder et al. 2014), via DARLA, extracted  
**F1 & F2** at 20%, **35%**, 50%, 65%, 80% of vowel duration

**remove stopwords**

`stopwords::stopwords(source = "marimo")`

## Number crunching

(in this order,  
cf. Stanley 2022)

**remove outliers**

Modified Mahalanobis Distance (Stanley 2020)

**normalize**

Log-means (Barreda & Nearey 2018)

**exclusions**

Pre-lateral or preobstruent environments only

**Pillai scores**

Calculated per speaker between pre-lateral /i ɪ/ and /eɪ ε/  
(Nycz & Hall-Lew 2013)

**Linear mixed-effects modeling**

Fit to formant measurements at 35%, for F1, F2 of Black and White speakers (4 models) (Freeman & Landers 2023)

## Tools

**Software**

R (R Core Team 2018), `tidyverse` (Wickham 2018)

**Visuals**

`ggplot2` (Wickham 2015)

# Speakers and vowel tokens

Ethnicity	Female	Male
Black	24	20
White	68	52

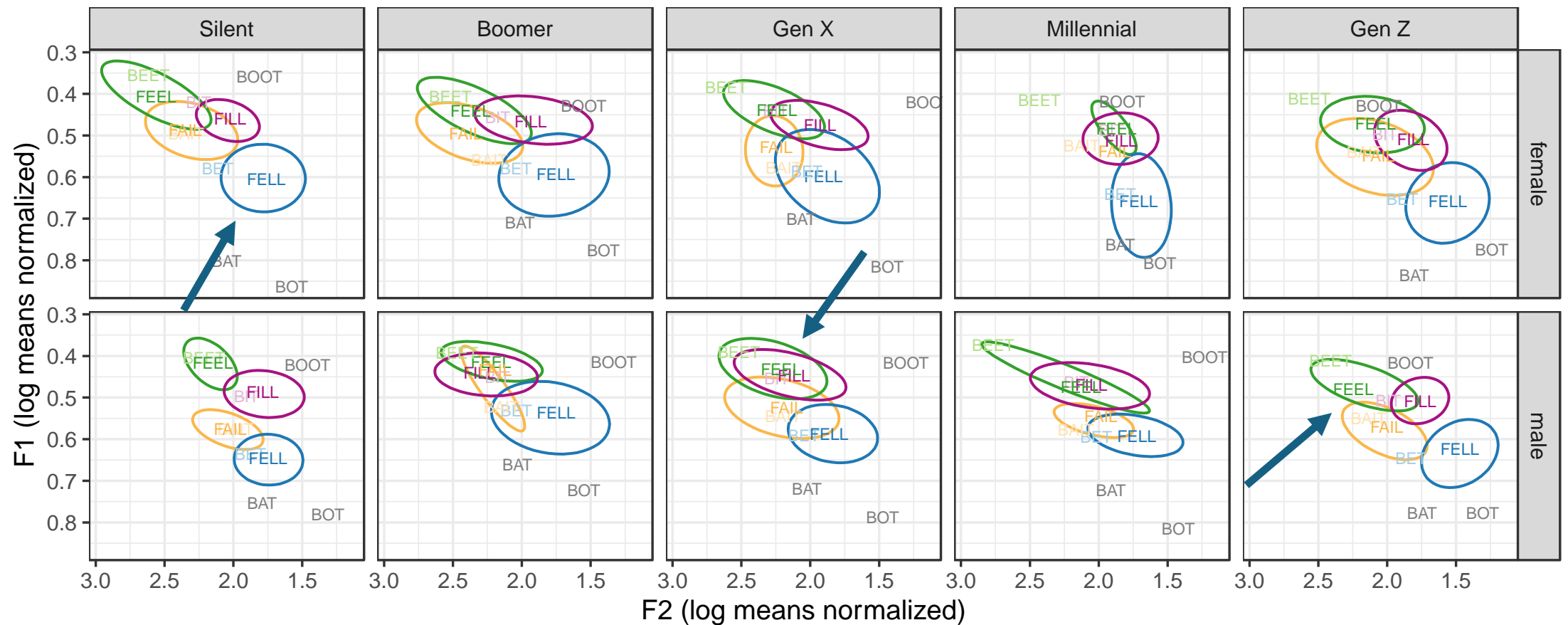
Black speakers born 1932 – 2004

White speakers born 1933 – 2003

Phoneme	Plain	Pre-lateral
/i/	10,393	1,322
/ɪ/	11,736	3,889
/eɪ/	13,330	726
/ɛ/	14,753	2,998

# Black Georgians' pre-lateral front vowels

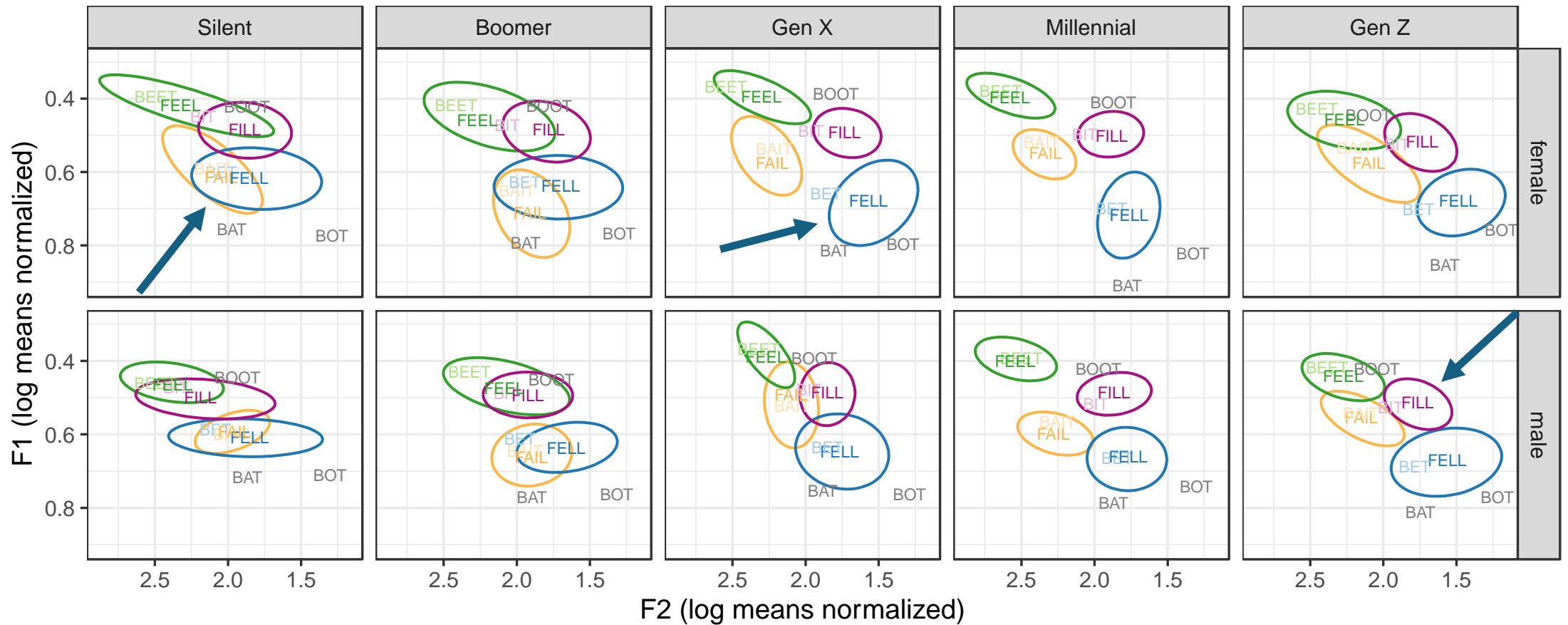
Black Georgians: Prelateral vowels by gender and generation



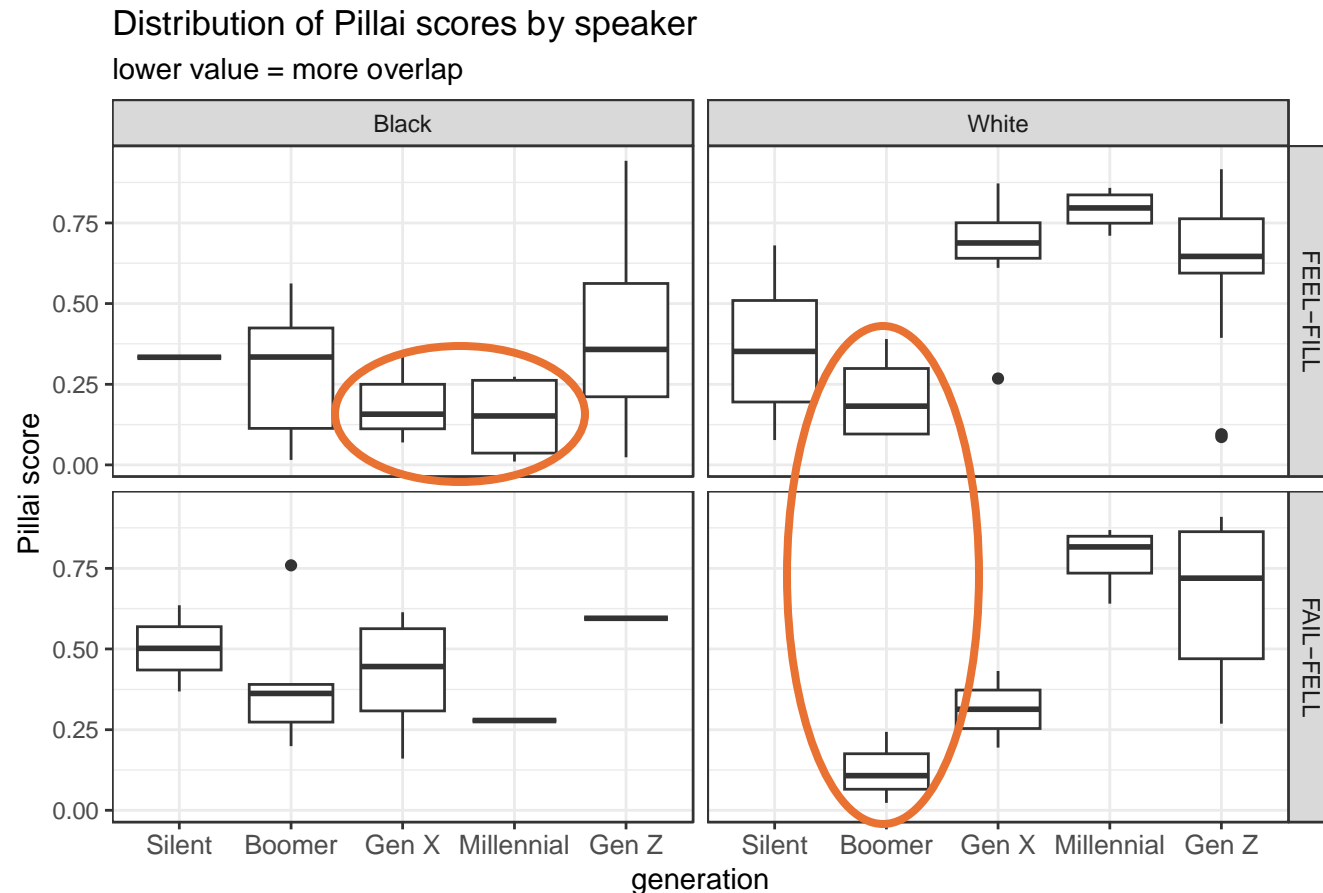


# White Georgians' pre-lateral front vowels

White Georgians: Prelateral vowels by gender and generation



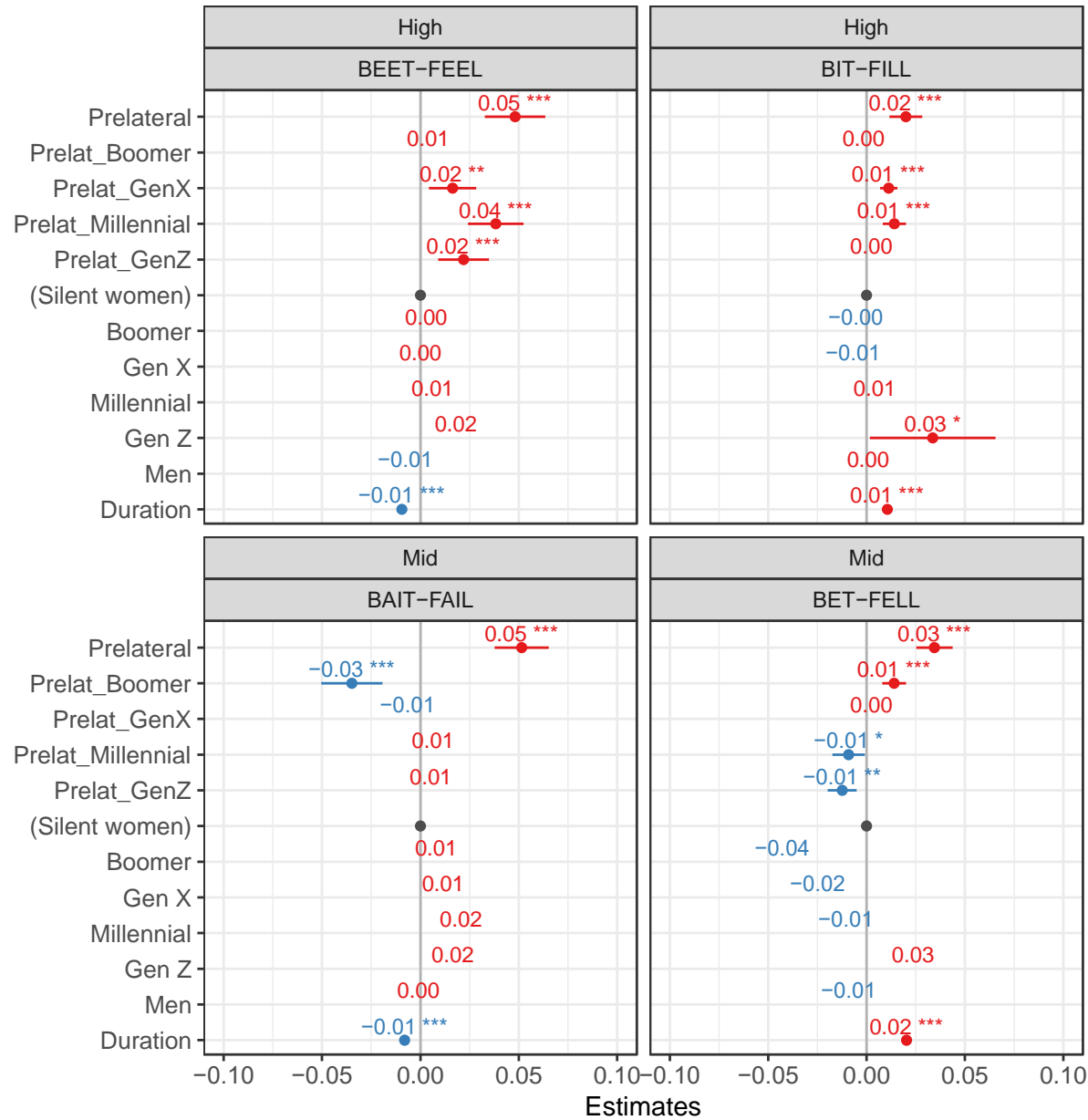
# Evaluation of merger via Pillai scores



- Black speakers
  - Smallest distinction for FEEL-FILL in Gen X, Millennial speakers
- White speakers
  - Smallest distinction for FEEL-FILL and FAIL-FELL among Boomers
- Disadvantages
  - Is change in F1, F2, or both formants?
  - Data loss: 1 score per speaker, 5 tokens needed

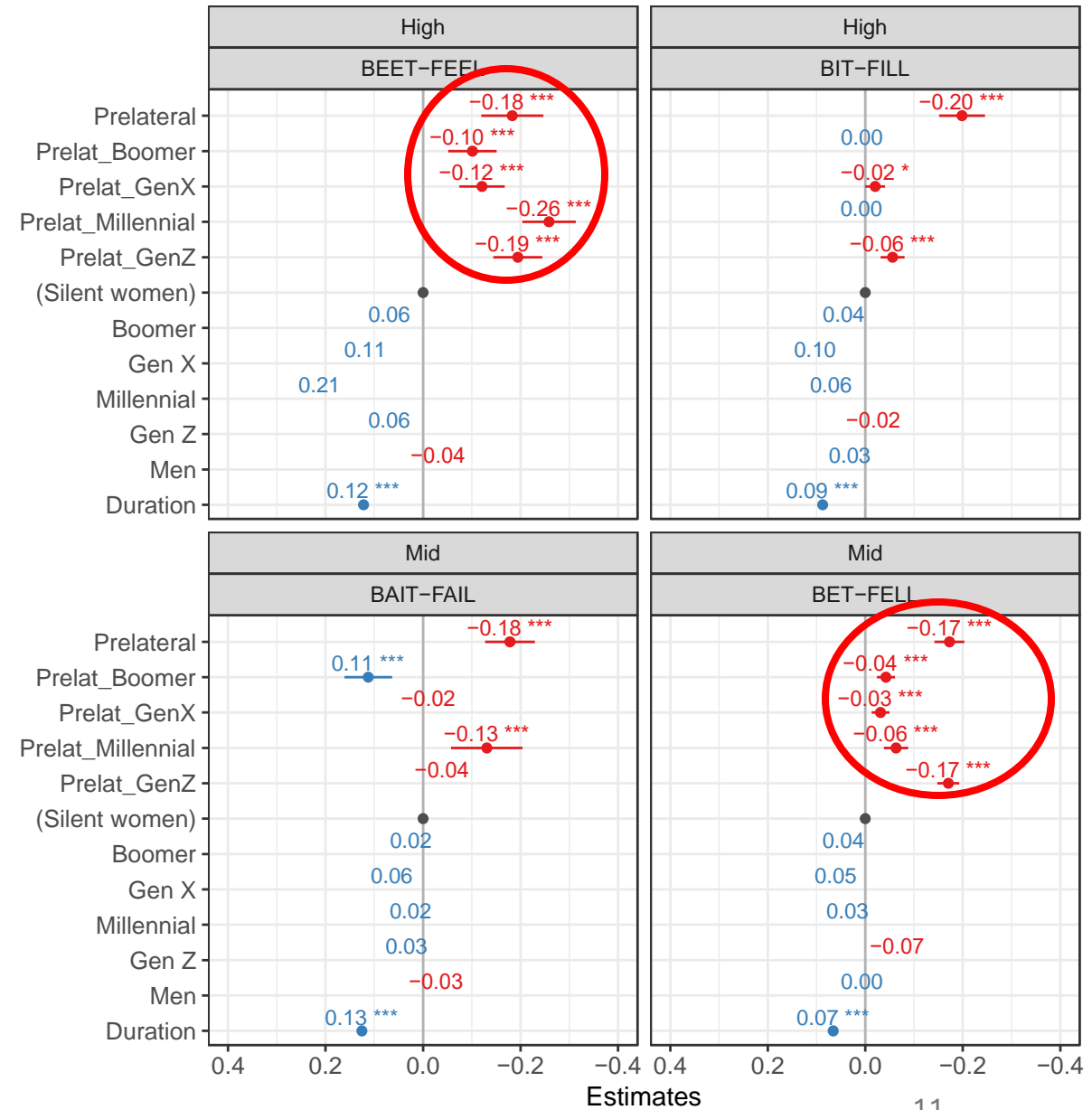
### Model coefficients for linear mixed effects models

Models fit to F1 at 35% for Black speakers



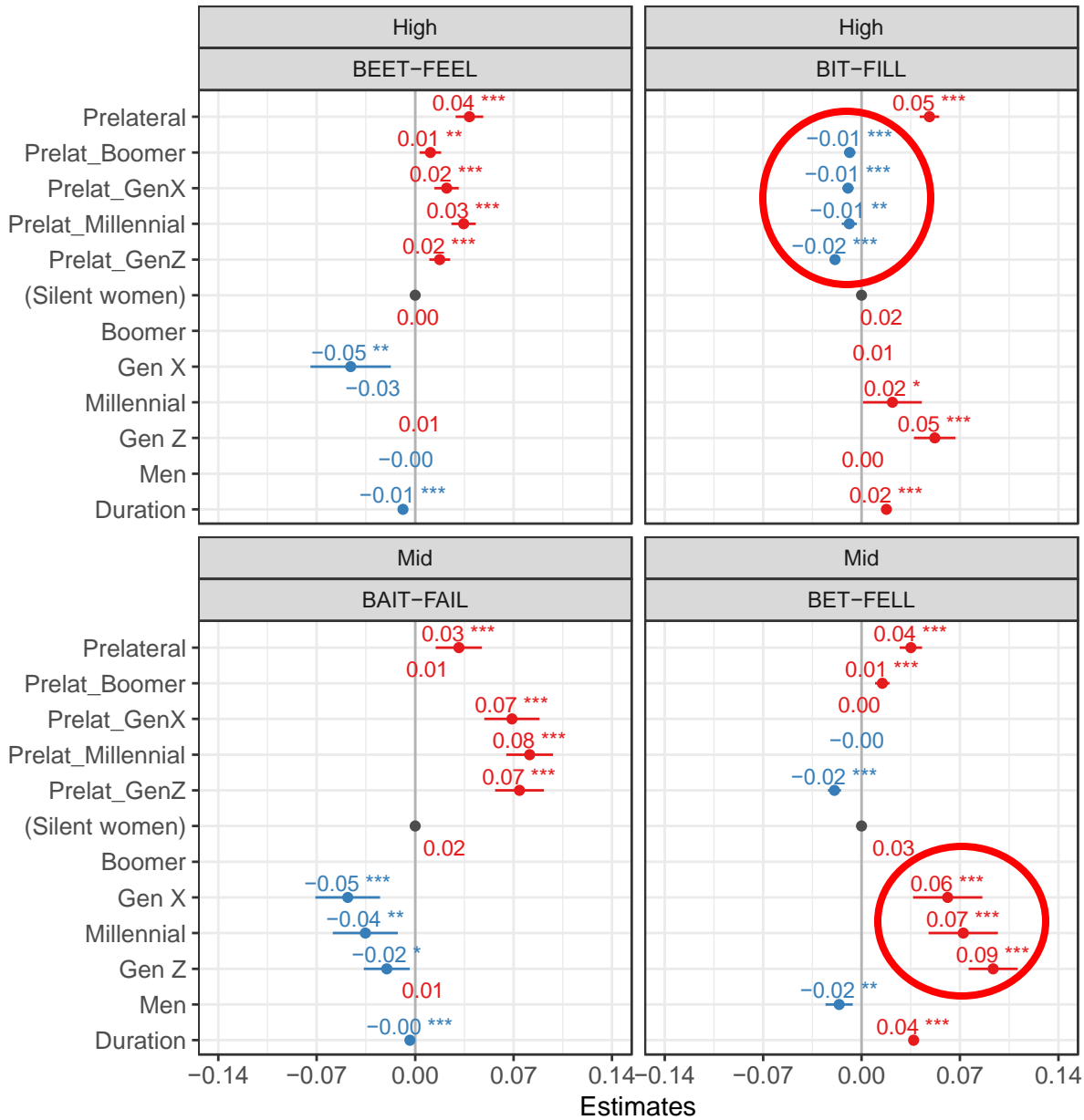
### Model coefficients for linear mixed effects models

Models fit to F2 at 35% for Black speakers



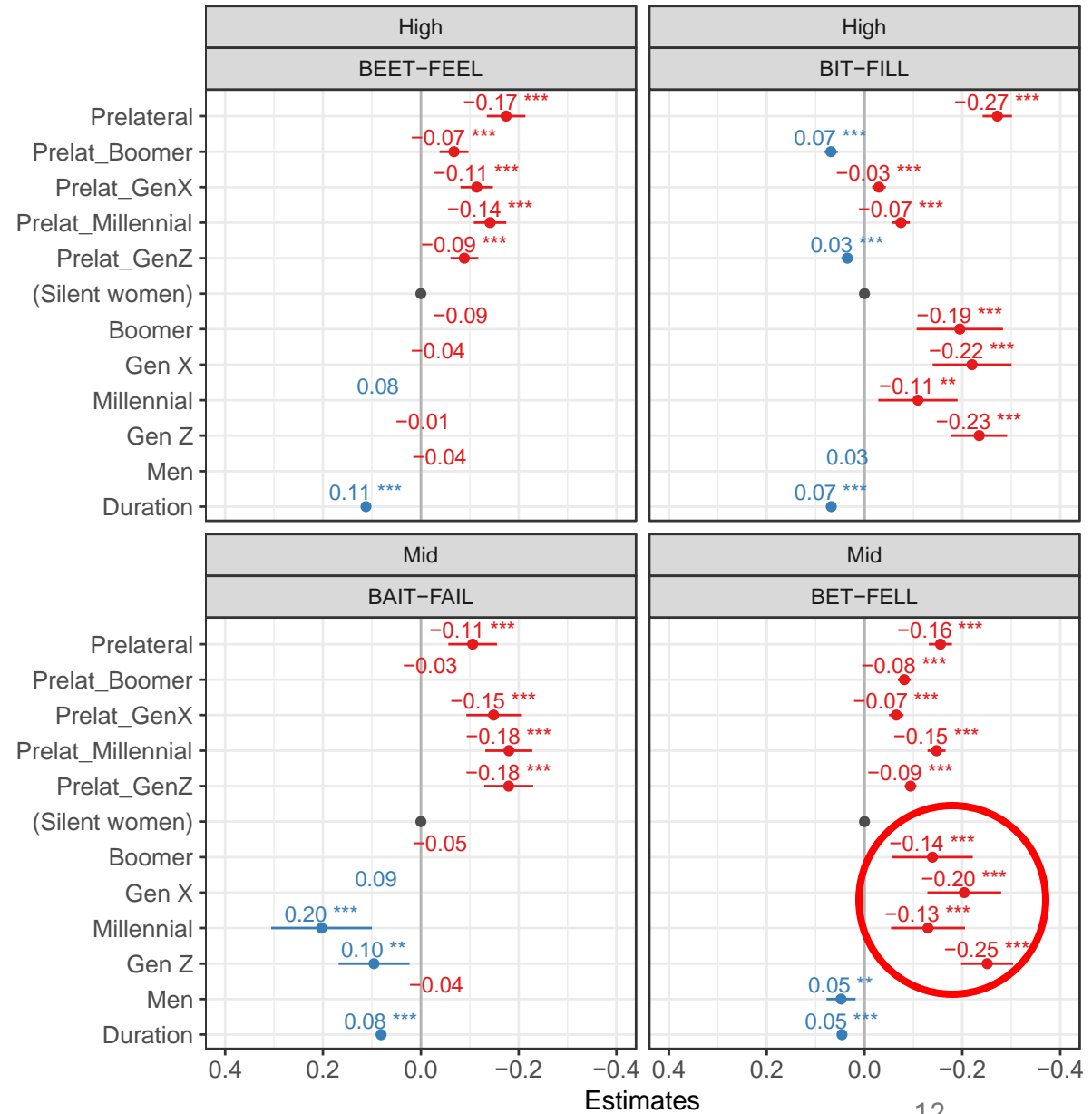
### Model coefficients for linear mixed effects models

Models fit to F1 at 35% for White speakers

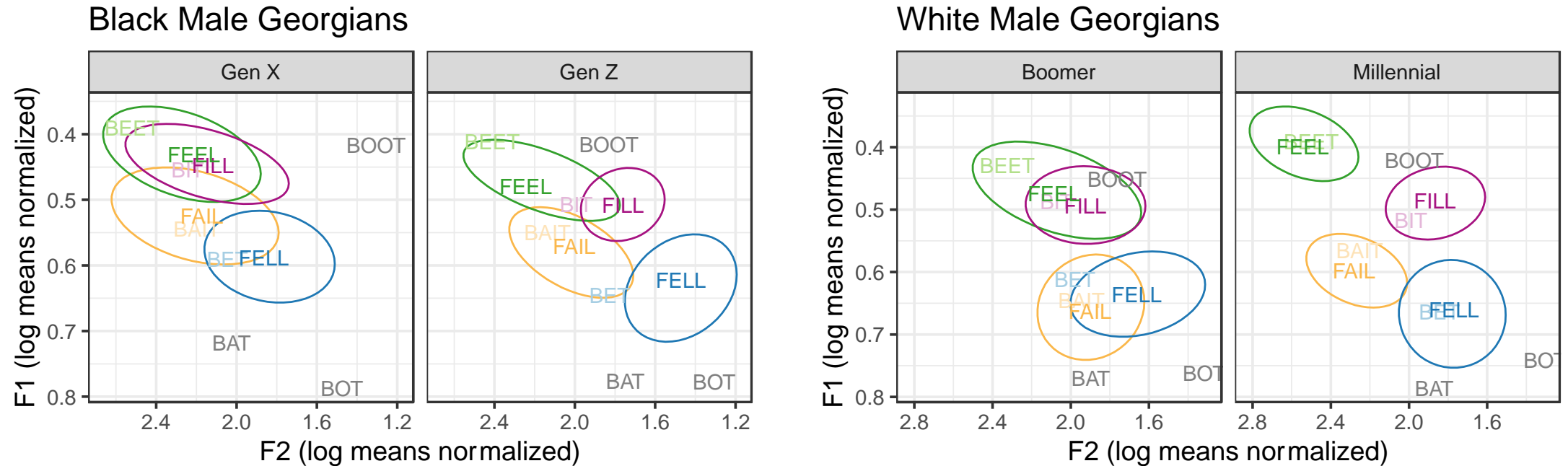


### Model coefficients for linear mixed effects models

Models fit to F2 at 35% for White speakers



# Peak and reversal of pre-lateral mergers



# Conclusions

- Takeaways

- Black speakers: most-merged generation is Gen X; least-merged is Gen Z
- White speakers: most-merged are Boomers; least-merged are Millennials.
- Historical change in pre-lateral vowels has taken place at different times for each ethnicity: namely, the merger seems to have peaked and faded earlier for White speakers than for Black speakers.
- To the extent that these reflect participation in SVS/AAVS, those systems show different diachronic trajectories and different synchronic features.

- Future work

- Consider *duration* for vowel vs. lateral, potentially in a trading relationship
- Trajectories, potentially including the lateral itself

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