Measuring Pittsburgh Neighborhoods with the Archive of Pittsburgh Language and Speech (APLS)

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Pittsburgh Neighborhoods

Pittsburgh is a city with very distinct neighborhoods, historically separated by the topography of hills and rivers. The Pittsburgh Speech and Society Project sampled four neighborhoods with distinct demographic and historic characteristics. See Johnstone (2013).

- **Lawrenceville** was a predominantly white, working-class neighborhood with mainly narrow, often steep streets and row houses that was beginning to experience gentrification.
- The **Hill District** was a predominantly Black, poor neighborhood, situated as the name suggests on a central prominent hill.
- **Forest Hills** was and is a predominantly white, middle-class neighborhood situated ten miles east of downtown. Also, historically employment was dominated by a Westinghouse research center, it has become a popular close suburb for downtown commuters.
- **Cranberry Township** is 25 miles north of Pittsburgh and was growing rapidly in the 2000s as a home to commuters who could take advantage of highways connecting it to Pittsburgh.

The design was such that these neighborhoods differed with their connection to Pittsburgh and have different network profiles.

Our Research Question

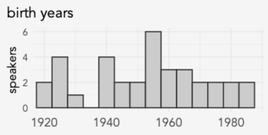
- Which of 11 phonological Pittsburghese features (vowel shifts, vowel overlap, and monophthongization) are conditioned by neighborhood?

Archive of Pittsburgh Language and Speech (APLS)

The Pittsburgh Interviews

- Data collection in 2003–2005 by Barbara Johnstone and Scott Kiesling.
- Each neighborhood as stratified by binary gender and four age groups.

neighborhood	female	male
Lawrenceville	4	6
Hill District	5	3
Forest Hills	7	4
Cranberry	4	2



- Tasks included long conversation, reading passages, and minimal pairs.

Archive of Pittsburgh Language and Speech (Villarreal et al 2025)

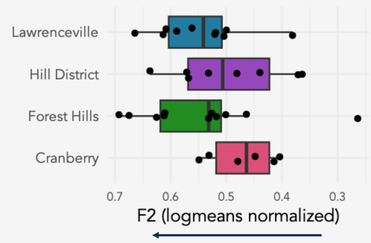
- APLS is a data resource containing recordings these interviews, annotated transcripts (phrase-, word-, and phoneme-level), and speaker metadata.
- We extracted formant data from all vowels.3

Quantitative Analysis

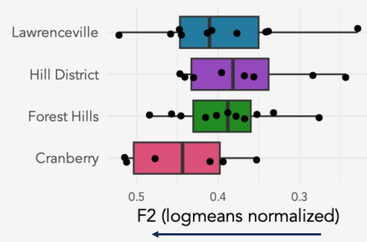
- Processed using recommended order of operations (Stanley 2022).
- For vowel shifts, we analyze log-means normalized midpoint formant measurements using mixed-effects regression models.
- For vowel overlap, we analyze midpoints using Pillai scores using the method recommended by Stanley & Sneller (2024).
- For monophthongization, we fit GAMMs and extract predicted values (Sóskuthy 2017).

Vowel Shifts

GOOSE-fronting



GOAT-fronting



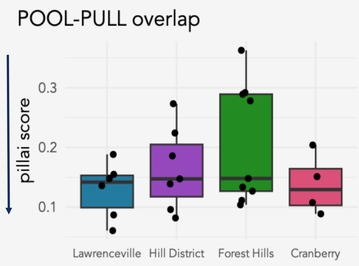
For each plot, arrows point in the direction of the more local realizations.

Pittsburgh Chain Shift

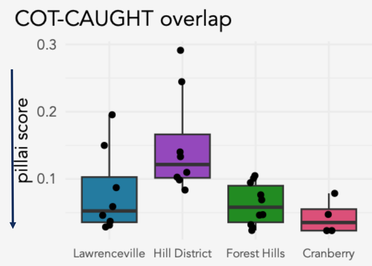
STRUT-lowering

Mergers

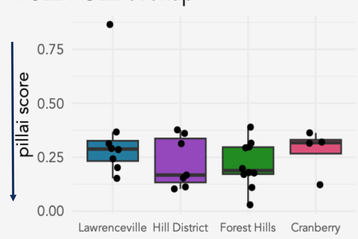
POOL-PULL overlap



COT-CAUGHT overlap

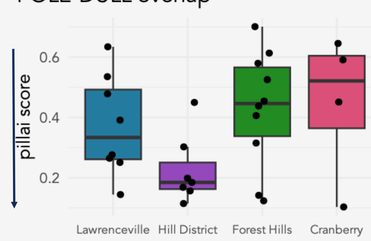


PULL-POLE overlap

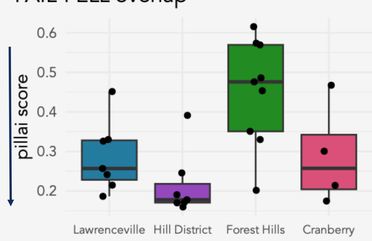


FEEL-FILL overlap

POLE-DULL overlap



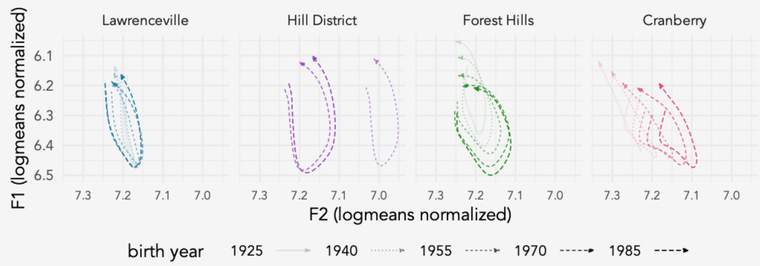
FAIL-FELL overlap



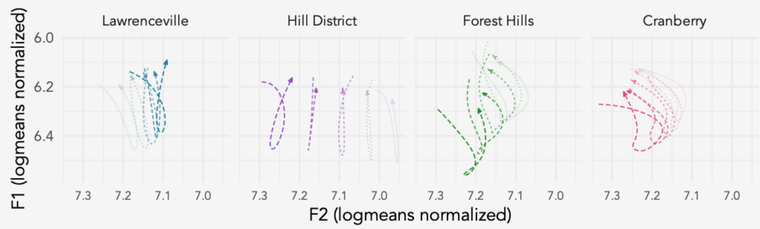
Monophthongization

Flatter lines indicate monophthongization.

MOUTH monophthongization



PRICE monophthongization



Discussion

Clearest findings

- Cranberry had less GOOSE-fronting but more GOAT-fronting.
- Hill District tended to have the most prelateral overlap, while Forest Hills had the least.
- Hill District had the least amount of the Pittsburgh Chain Shift.
- No clear effects for monophthongization (though global positions of those vowels change differently over time by neighborhood).

Main takeaways

- Focusing on neighborhood highlights how variables co-occur.
- APLS makes it easy to confirm and validate previous findings.

Caveat

- Unfortunately, almost all comparisons were not statistically significant.
- This is likely due to summarizing data by speaker and a relatively small number of speakers (28 speakers across four neighborhoods).
- We suspect that these effects are indeed real; the stats just don't provide strong evidence for that.

References

Johnstone, Barbara. 2013. *Speaking Pittsburghese: The story of a dialect.* Oxford University Press.

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Download this poster at joeystanley.com/ads2026

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