Finding pockets of social variation in the Digital Archive of Southern Speech

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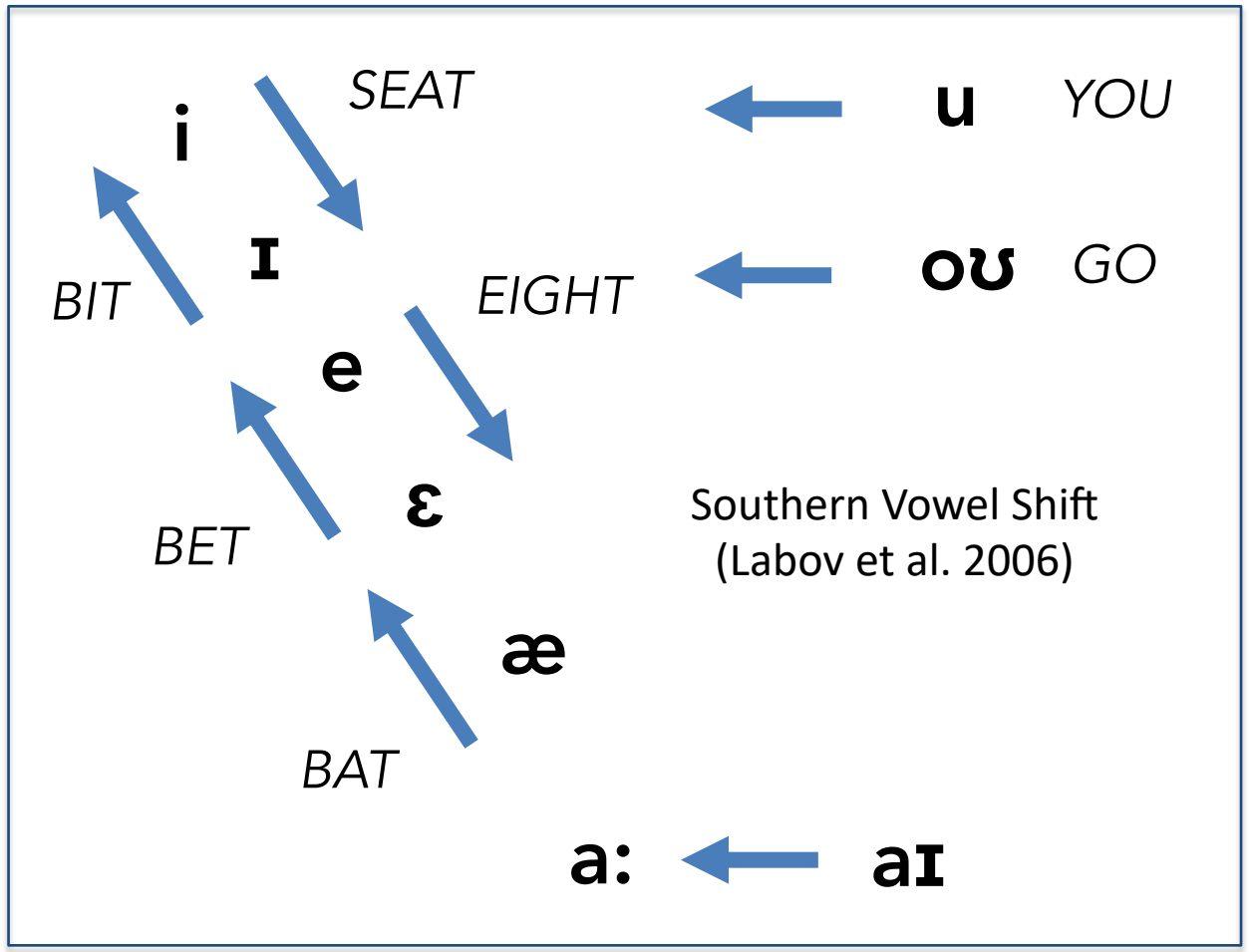
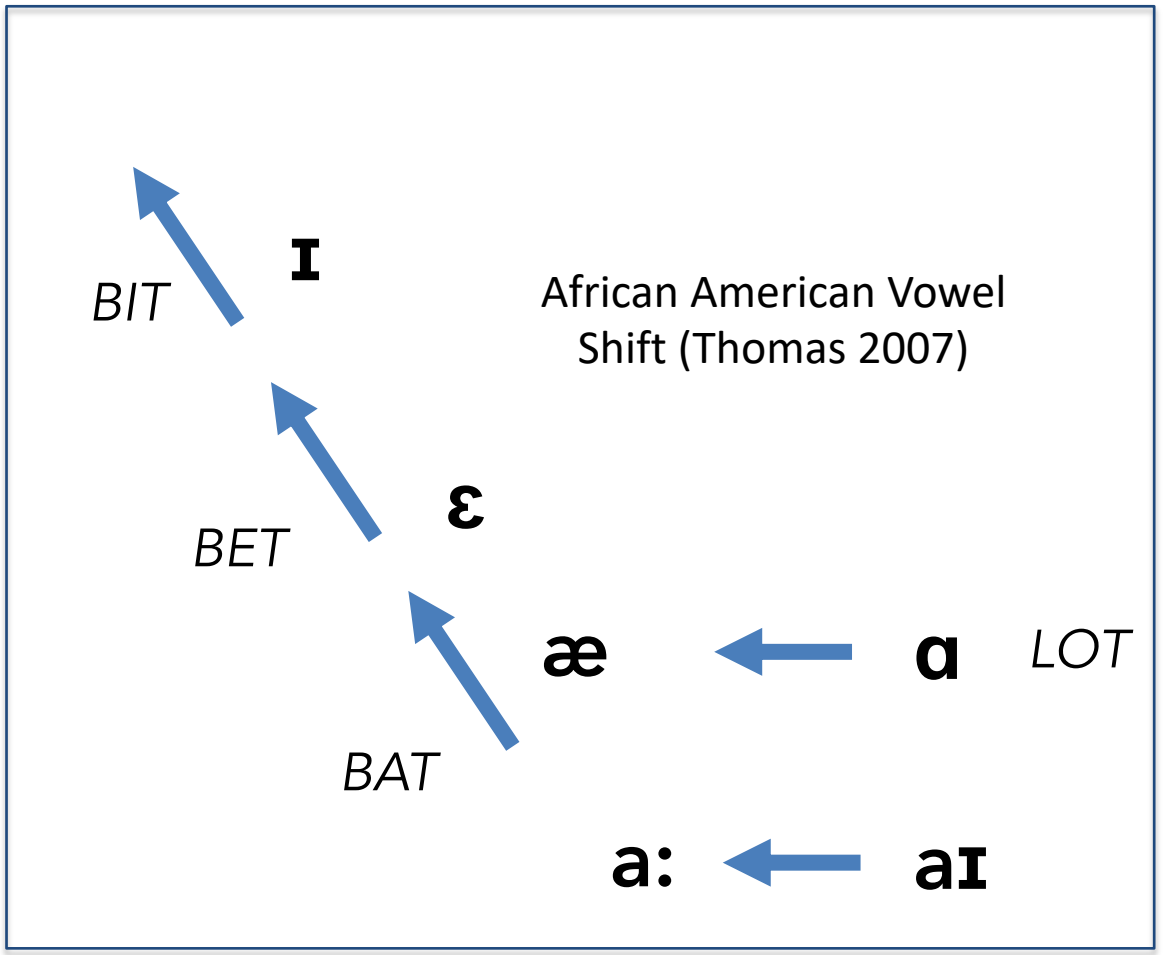
5th Annual Linguistics Conference at UGA
October 12–13, 2018
Athens, Georgia

Southern Shifting





Potential outcomes of Southern shifting

- Southern Vowel Shift
  - Increased overlap or "swapping" of /i ɪ/, /eɪ ɛ/; overlap of /æ ɛ/
  - Decreased acoustic distance between /u i/, /oʊ i/

- African American Vowel Shift
  - Increased overlap of /i ɪ/, /eɪ ɛ/, /æ ɛ/ (swapping less likely)

- SVS vs. AAVS
  - Front vowels positioned differently
  - Back vowels positioned differently
    …in European American vs. African American speech

Research Questions

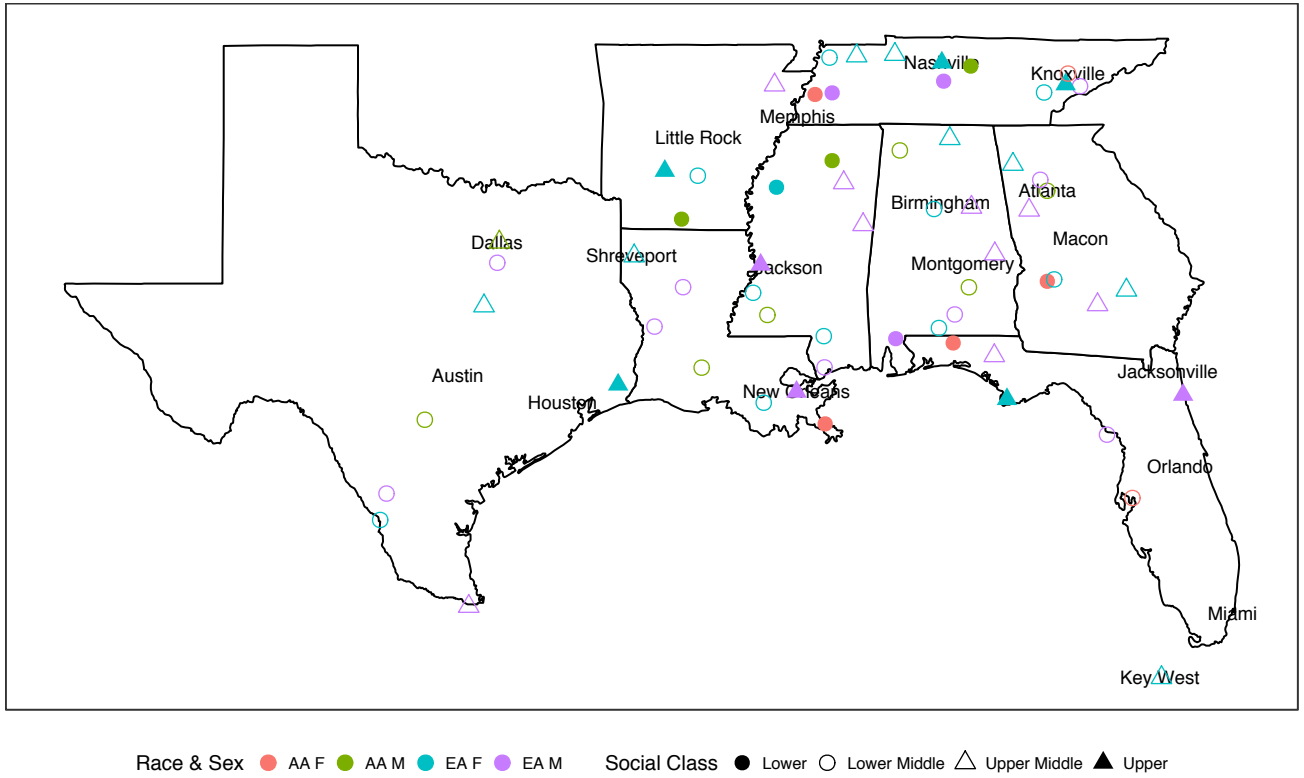
- Does shifting strengthen over time?
  - *Age effects*
- Do European American and African American speakers shift differently?
  - *Race effects*
- Do women and men shift differently?
  - *Sex effects*
- Do speakers in different parts of the South shift differently?
  - *Effect of state*

- We test for the SVS and AAVS in the Digital Archive of Southern Speech
  - This large corpus permits simultaneous examination of multiple social factors

Data and Methods

The Digital Archive of Southern Speech

- Audio corpus of semi-spontaneous linguistic atlas interviews; 367 hours (Kretzschmar et al. 2013)
- 64 American speakers native to 8 Gulf States, recorded 1970–1983
- Speakers represent a balanced mixture of ethnicities, social classes, education levels, ages
- DASS is being transcribed, aligned, and acoustically analyzed at UGA (Olsen et al. 2017)
  - All speakers are represented in current dataset



Data

- Data Processing (Olsen et al. 2017)
  - Audio was digitized from original reel-to-reel format.
  - Interviews were manually transcribed and spot-checked by trained workers.
  - They were then processed with DARLA (Reddy & Stanford 2015)
    - ProsodyLab for forced alignment (Gorman *et al.* 2011)
    - This version of DARLA used FAVE for formant extraction (Rosenfelder *et al.* 2014)

- Exclusions
  - Only tokens with primary stress
  - Mahalanobis distance for filtering: excluded points grater than 95% quantile of a chi-squared distribution
  - Normalized using the Lobanov transformation

Overlap measured with Pillai scores

- What are Pillai scores? (*cf.* Nycz & Hall-Lew 2013)
  - An output of MANOVA, a test that can model multiple dependent variables.
  - Measures the difference between two groups in a multivariate space.
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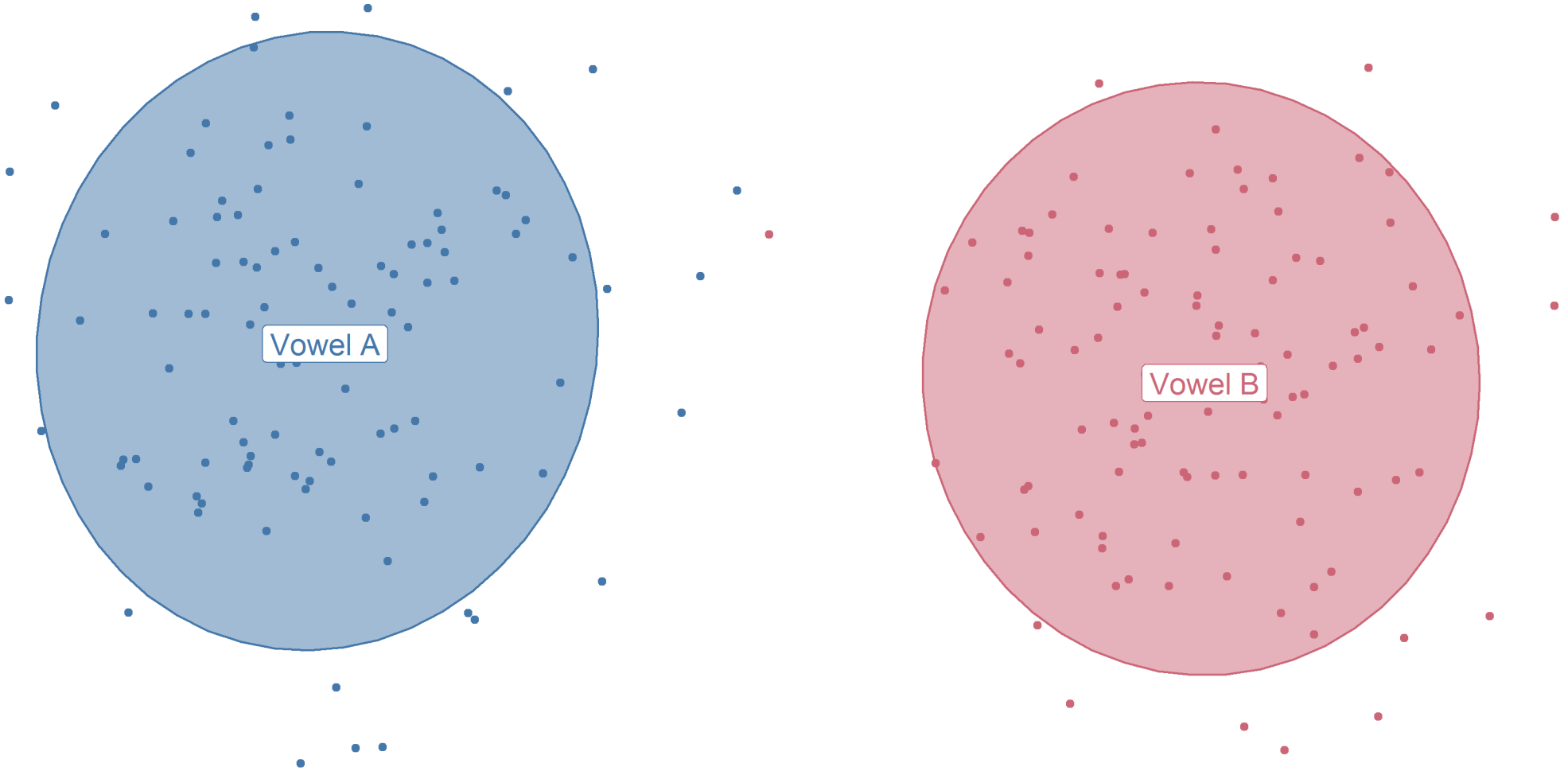
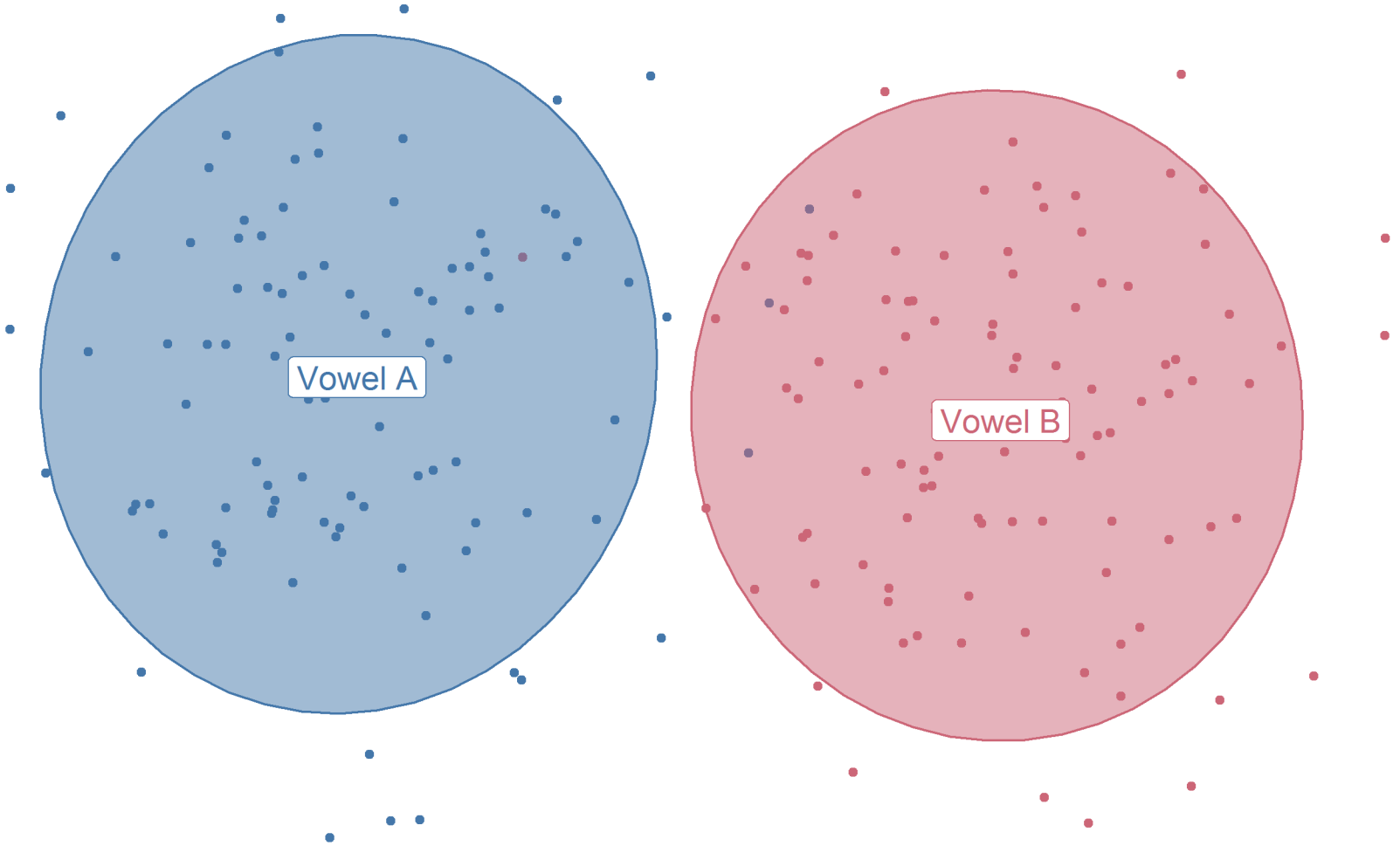
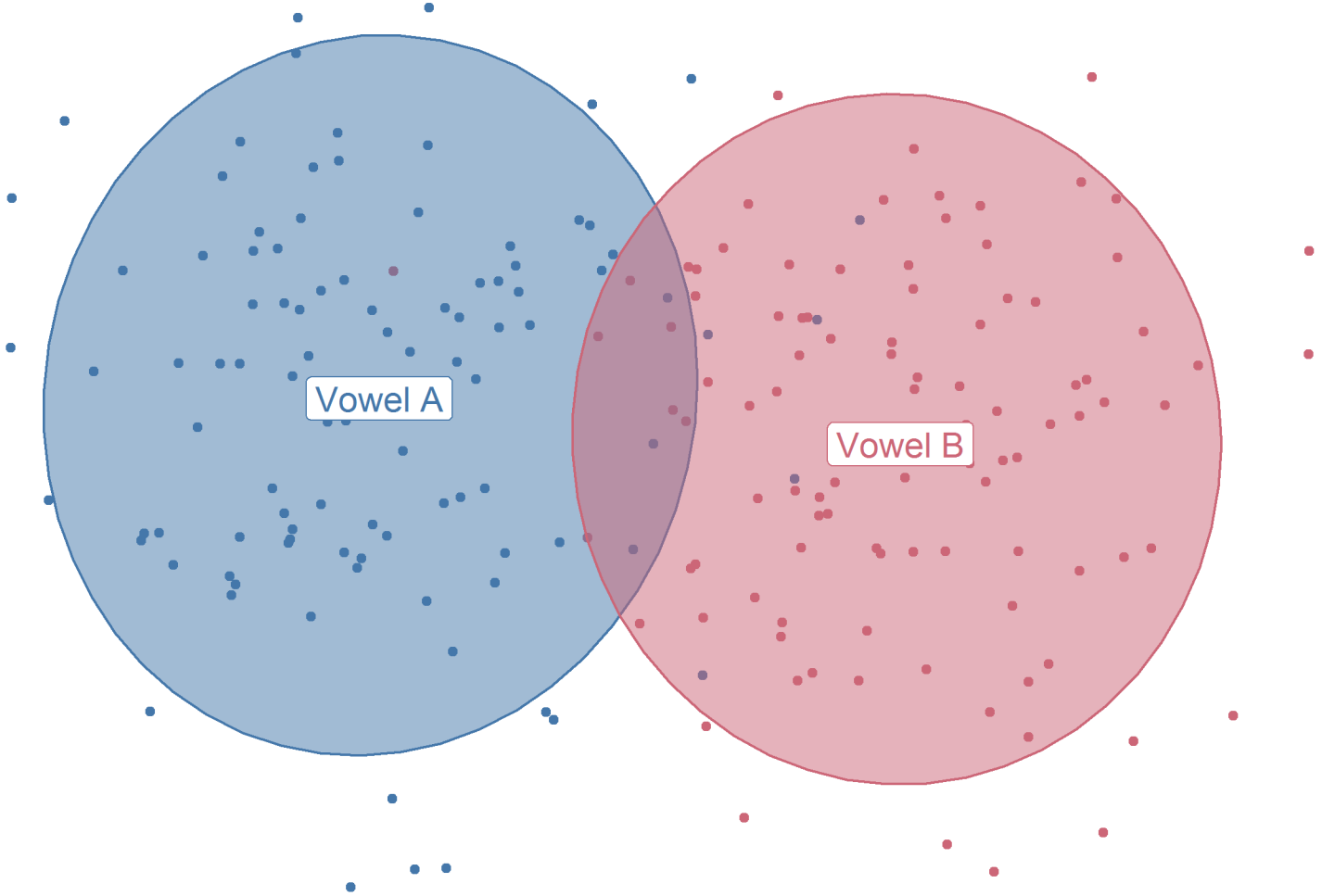
Pillai score: 0.9



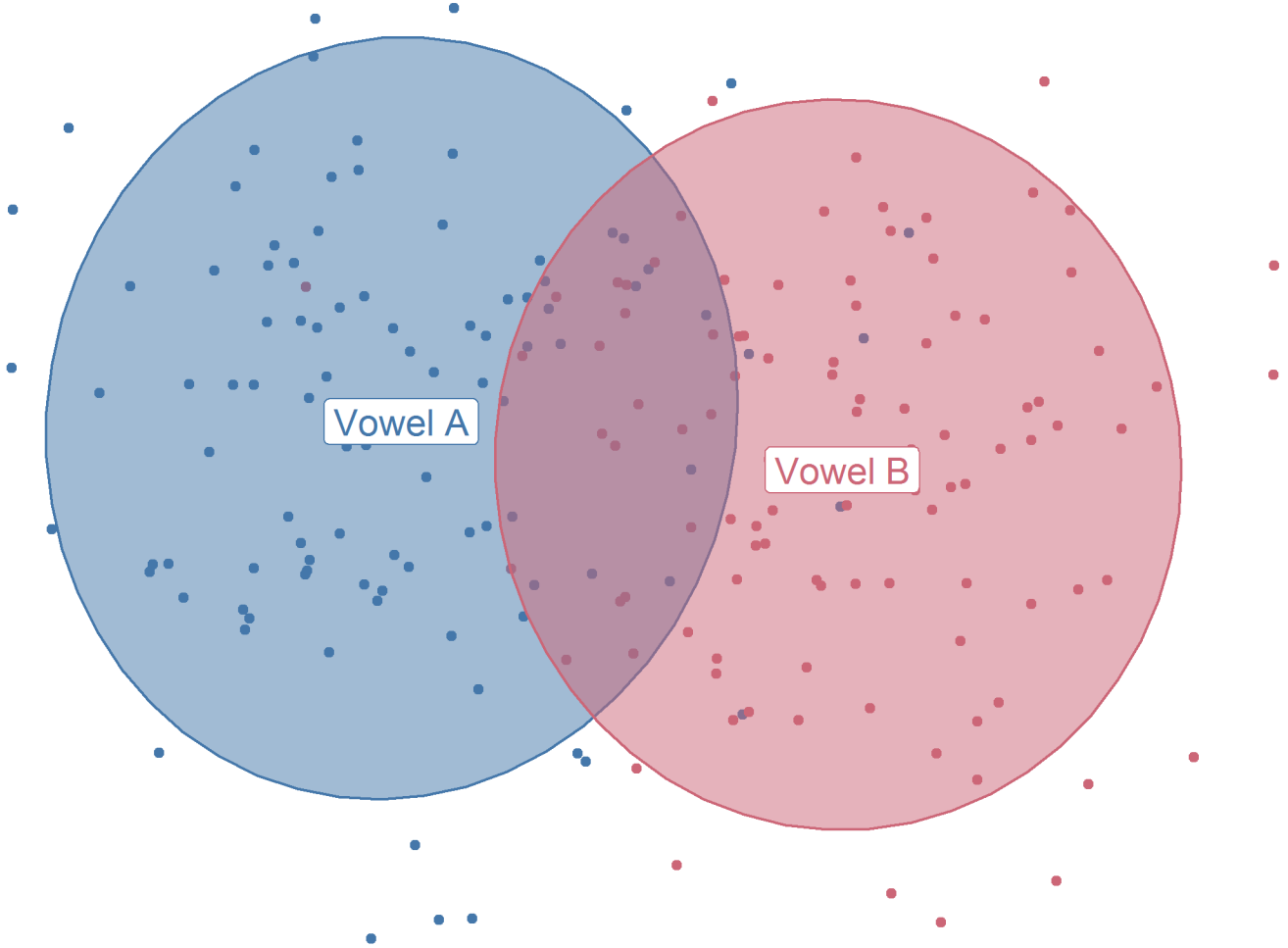
Pillai score: 0.8



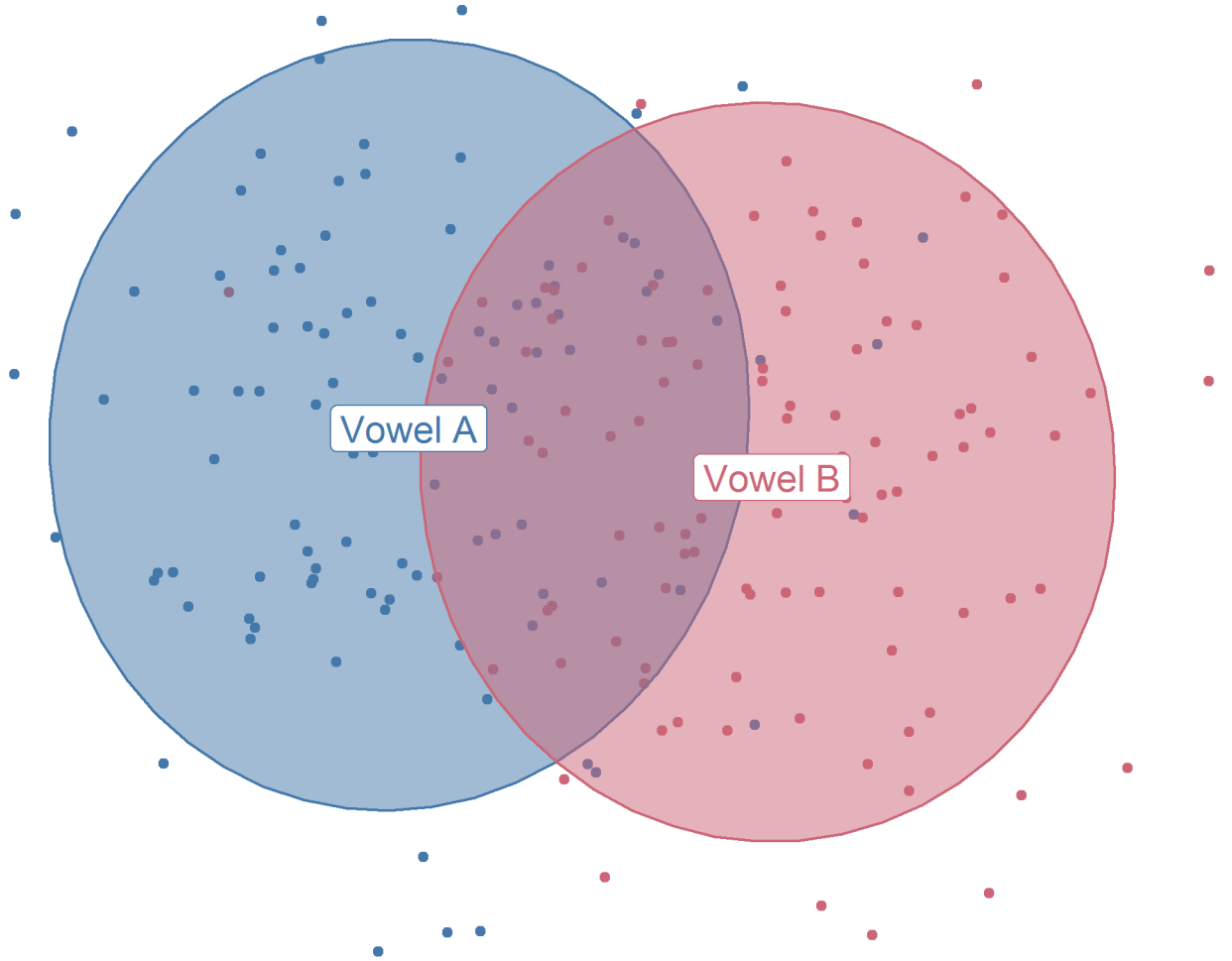
Pillai score: 0.7



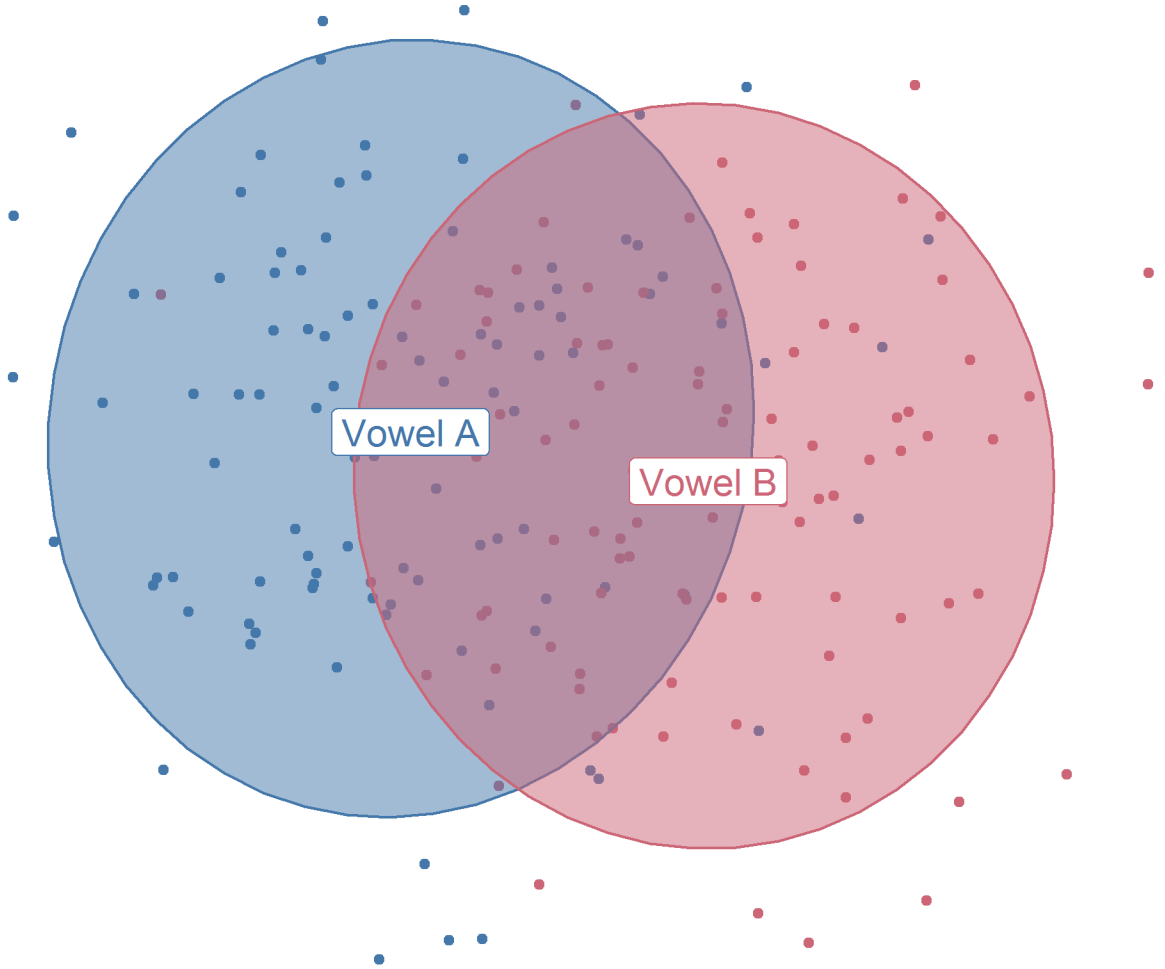
Pillai score: 0.6



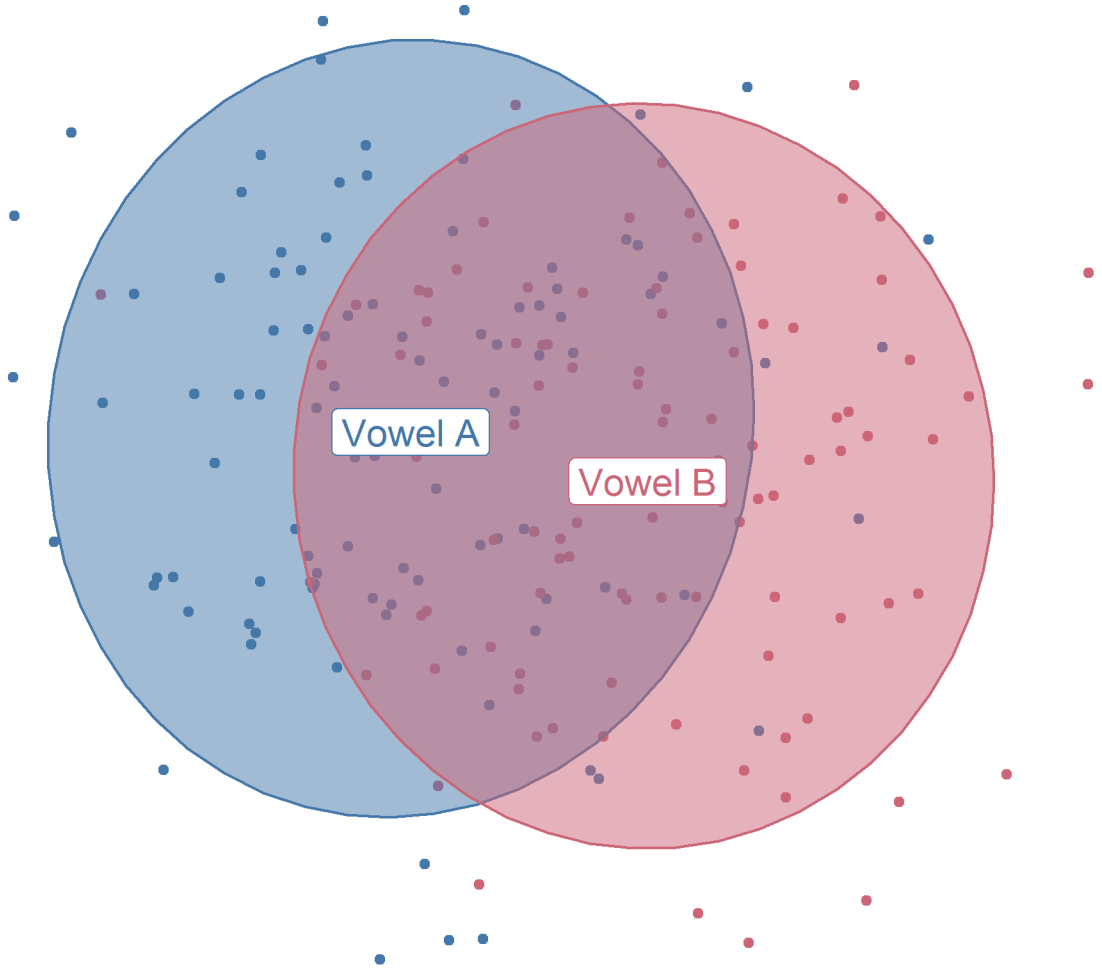
Pillai score: 0.5



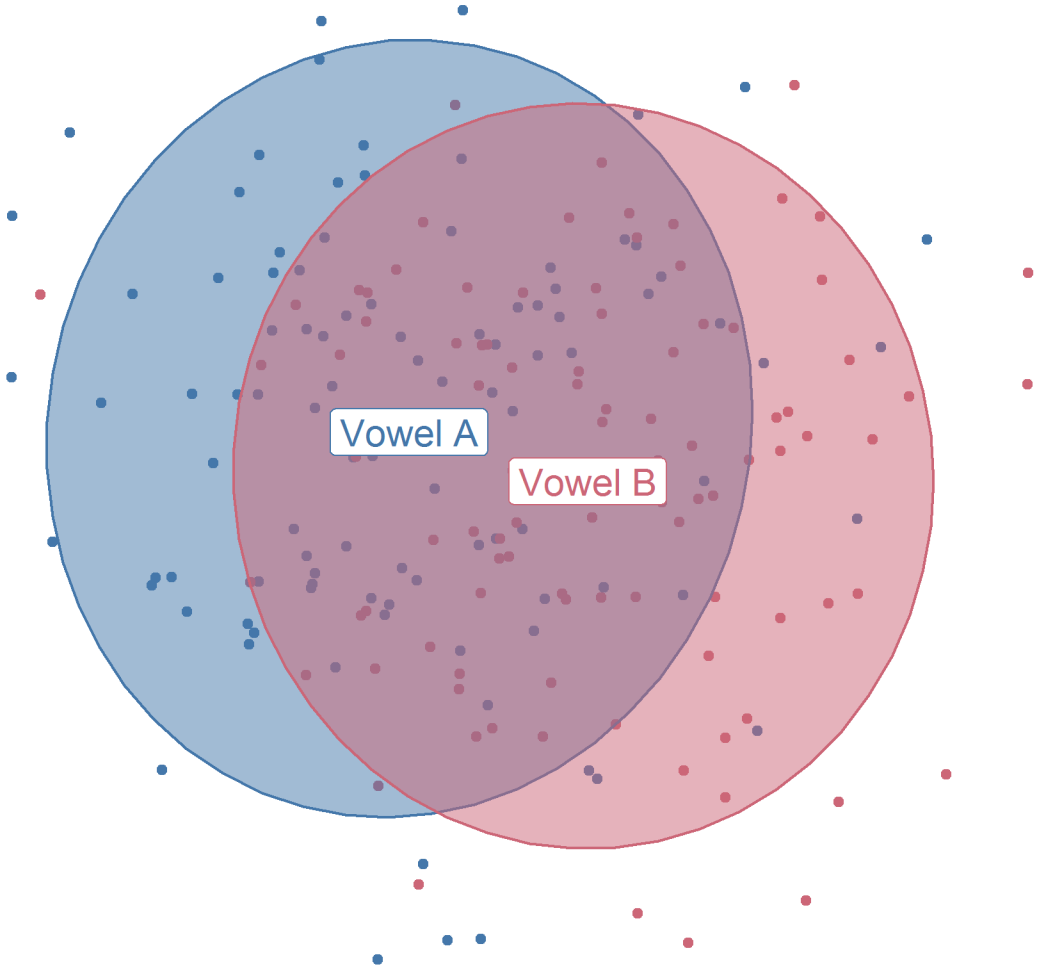
Pillai score: 0.4



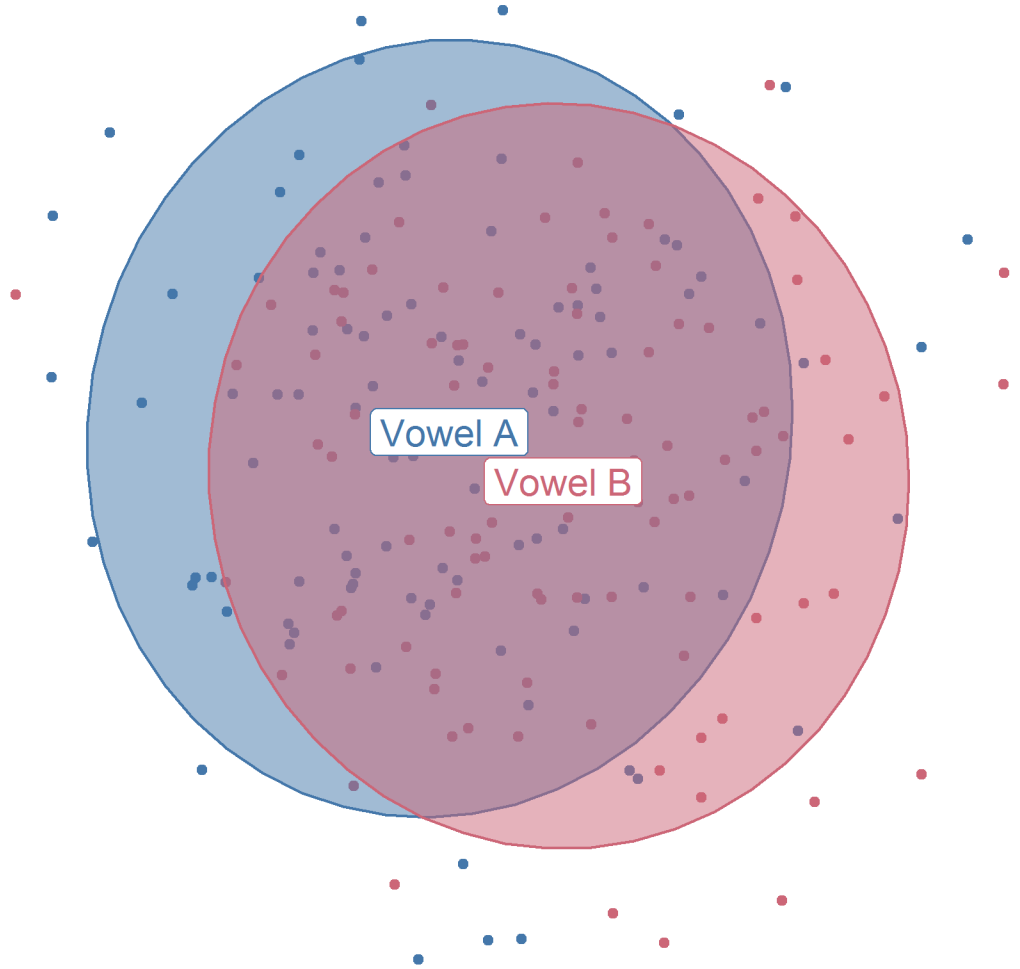
Pillai score: 0.3



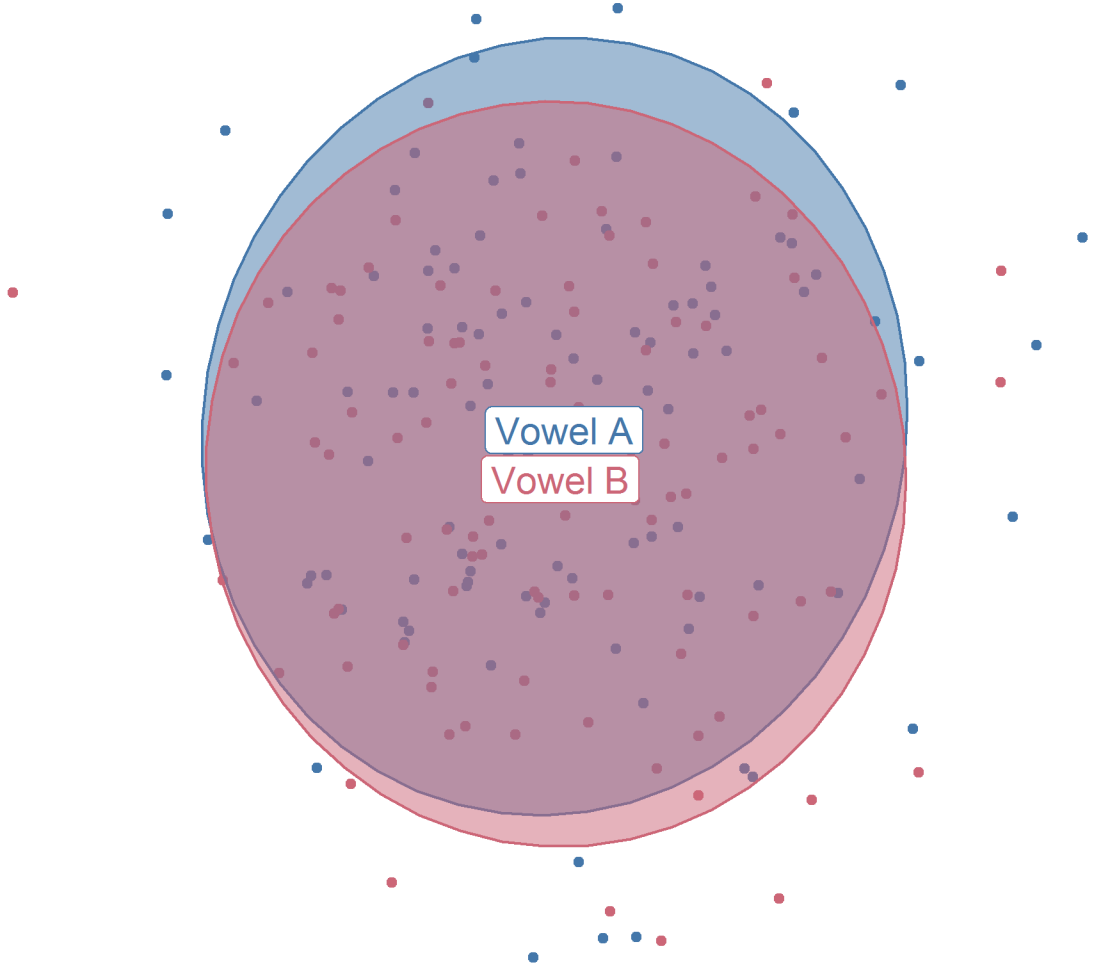
Pillai score: 0.2



Pillai score: 0.1



Pillai score: 0.015



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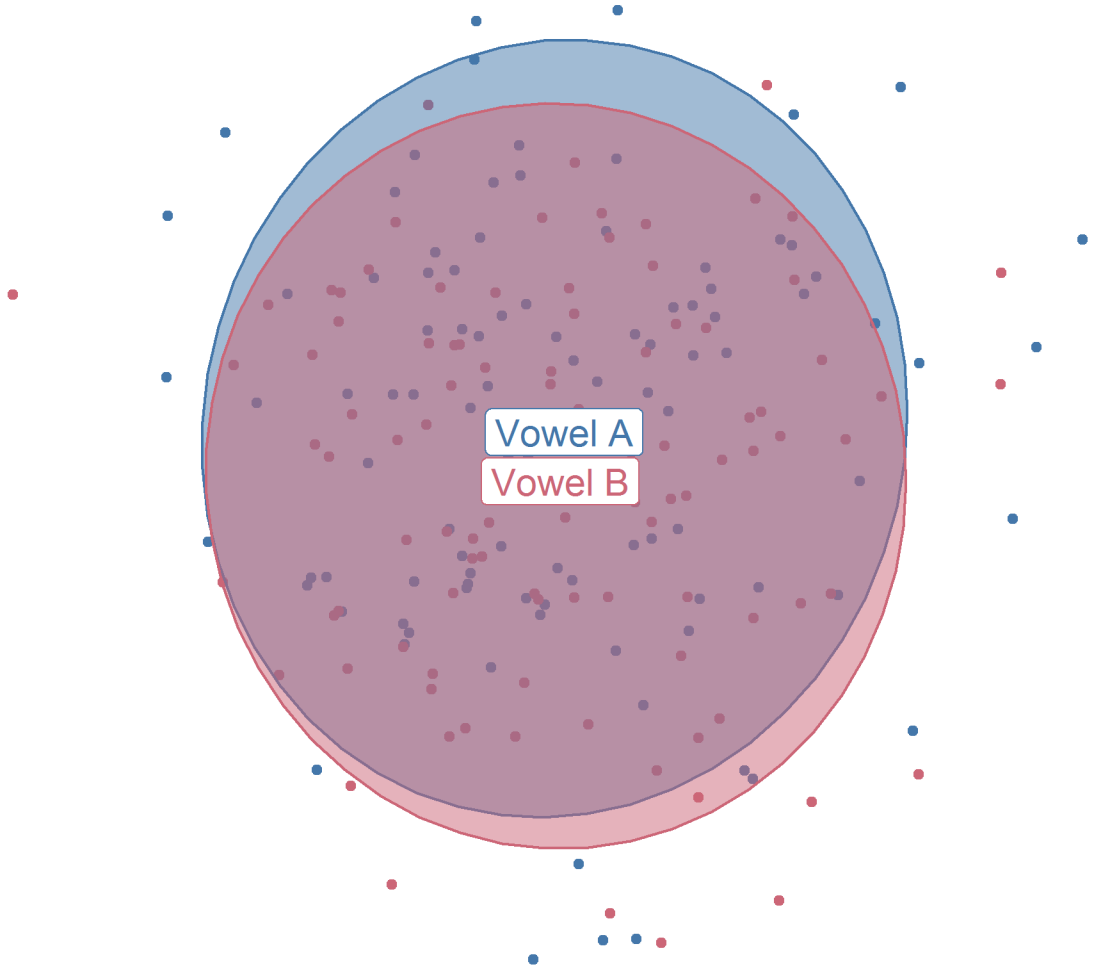
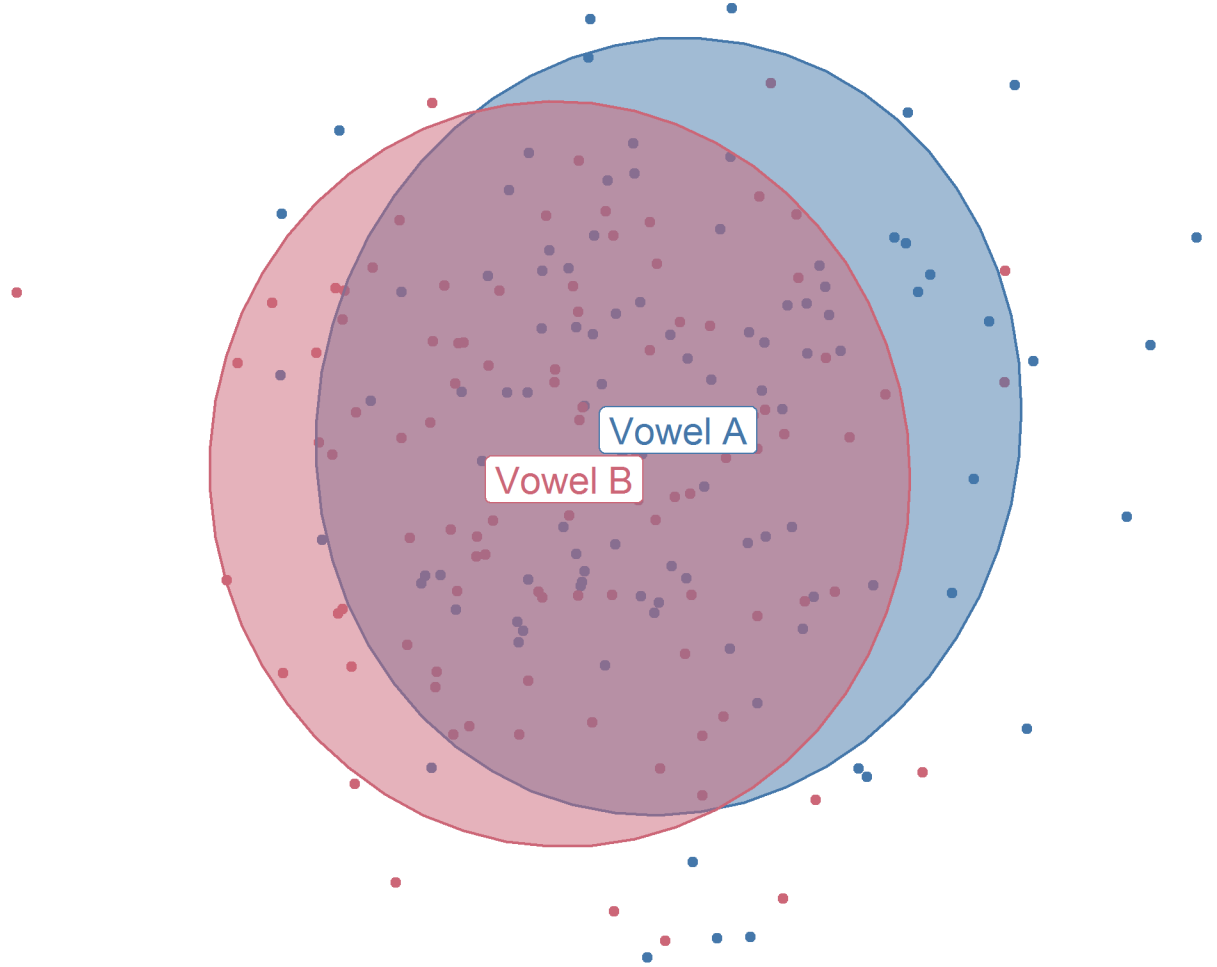


Pillai score: -0.1



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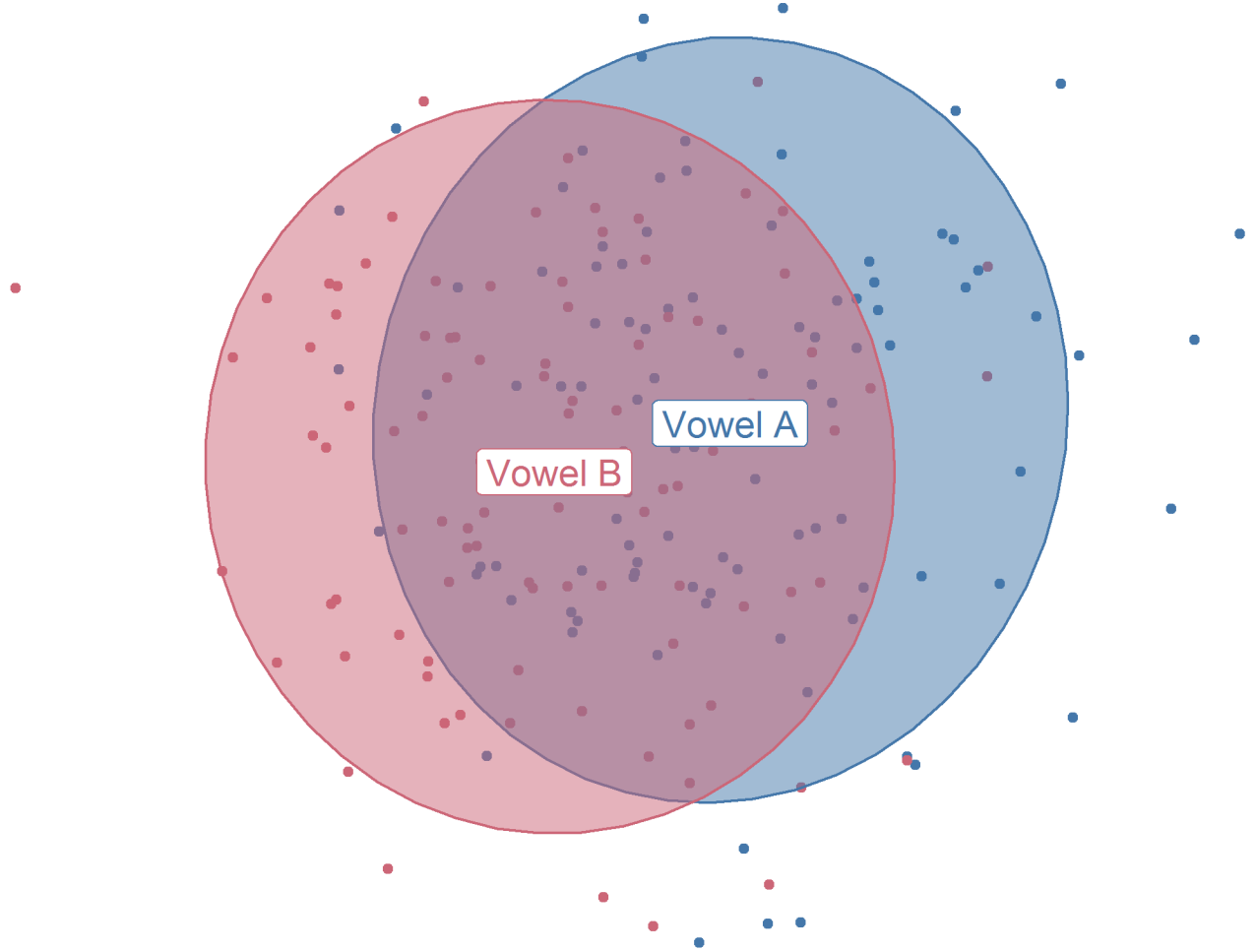

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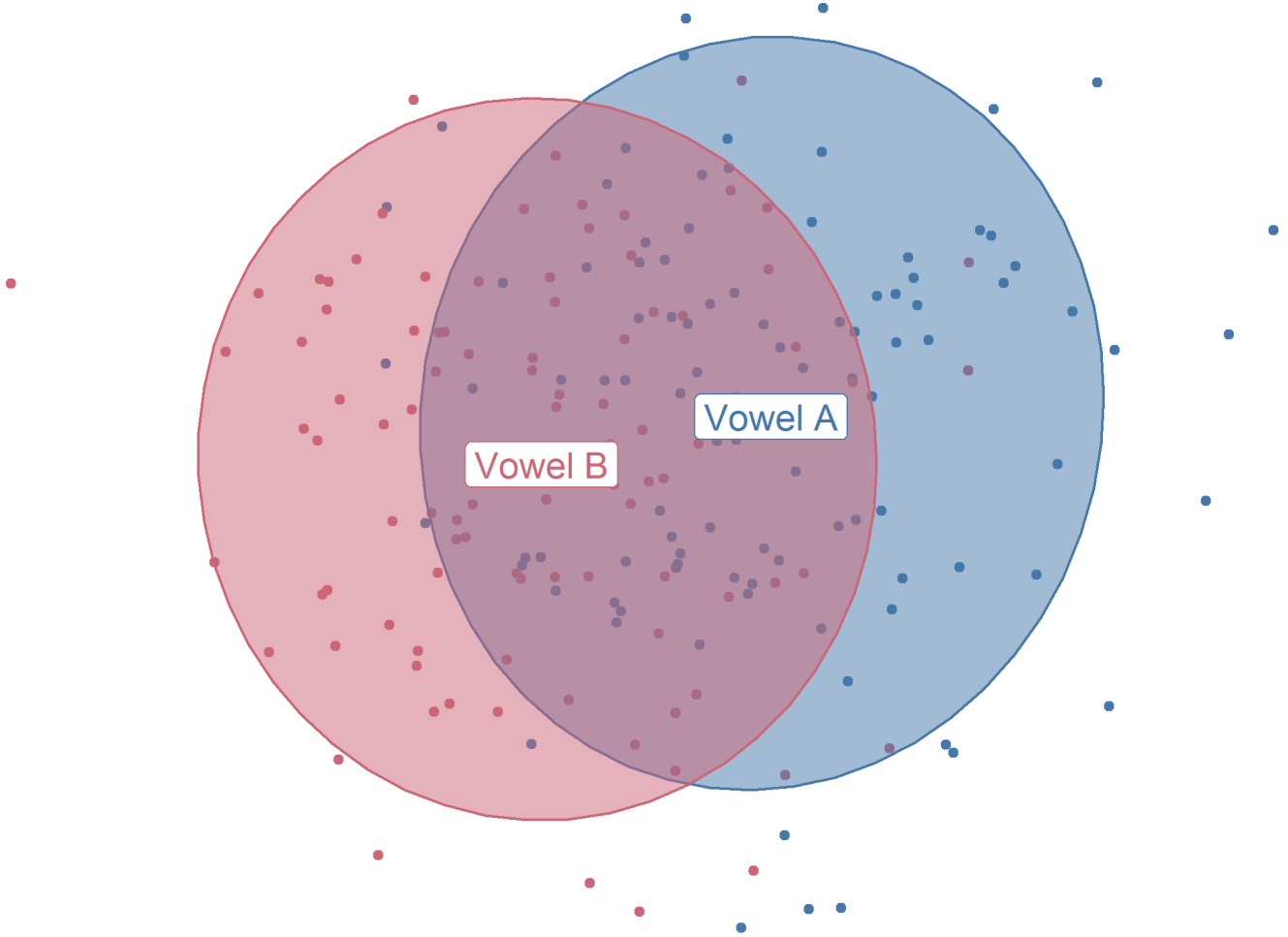

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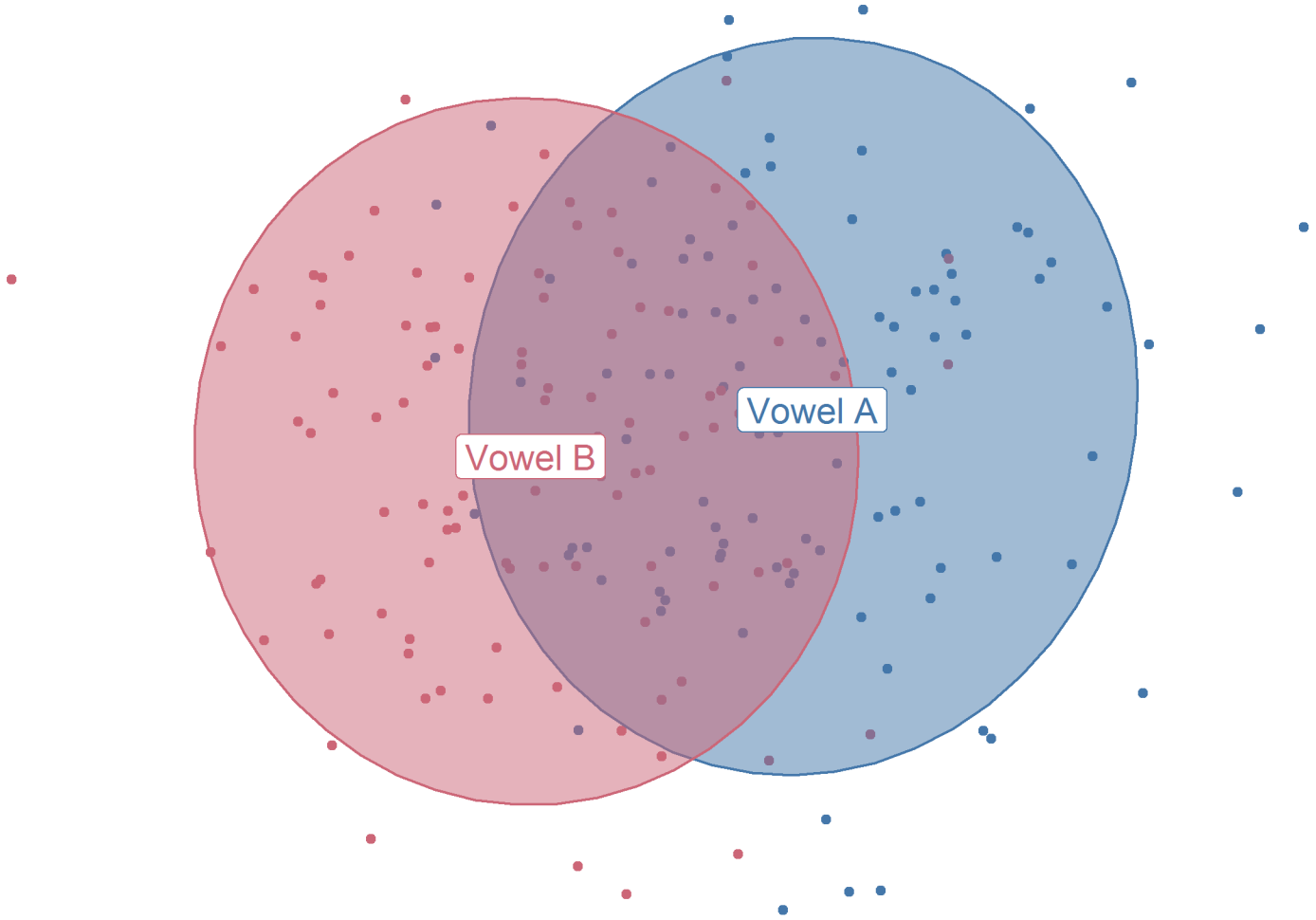
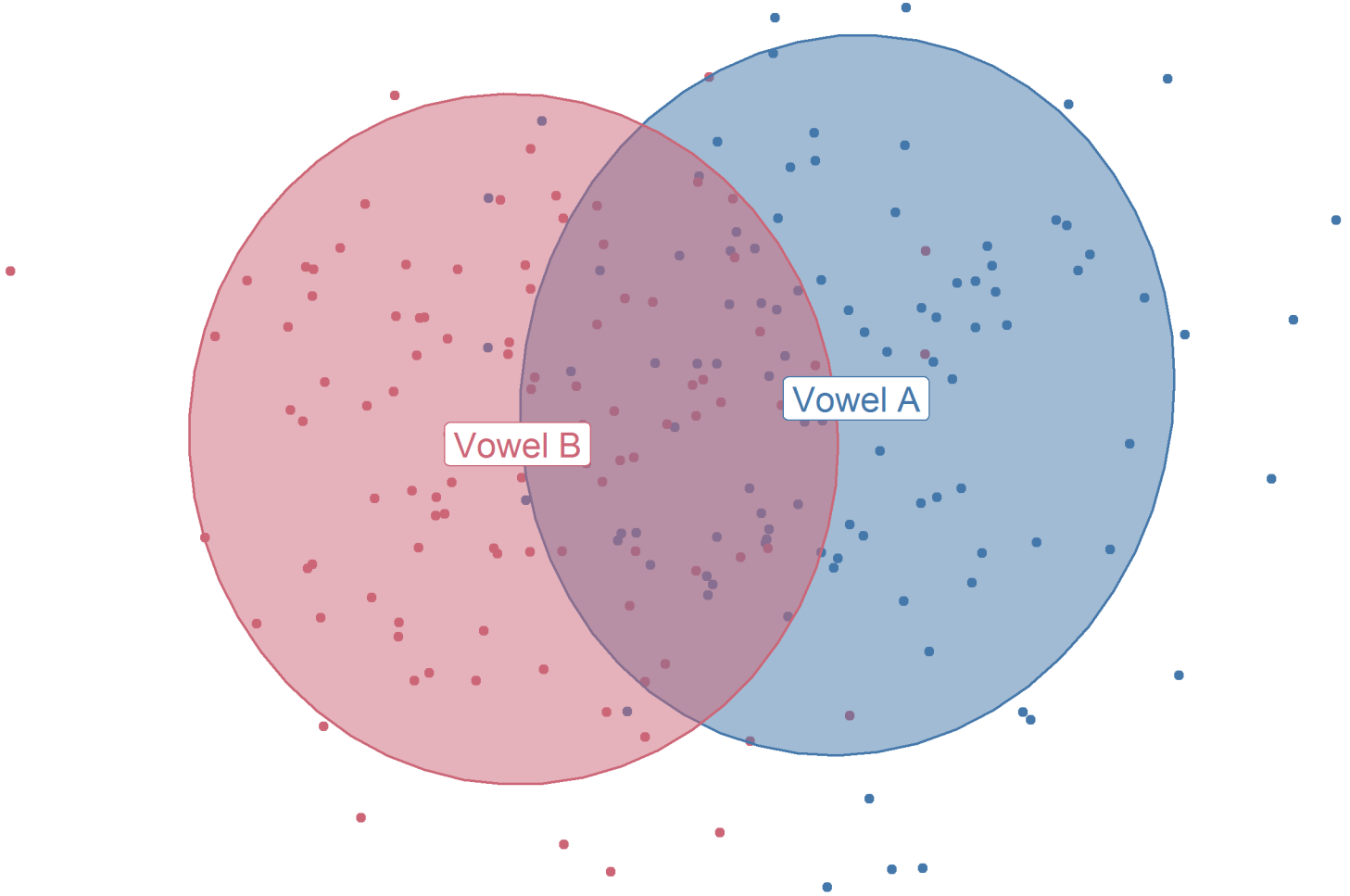


Pillai score: -0.5



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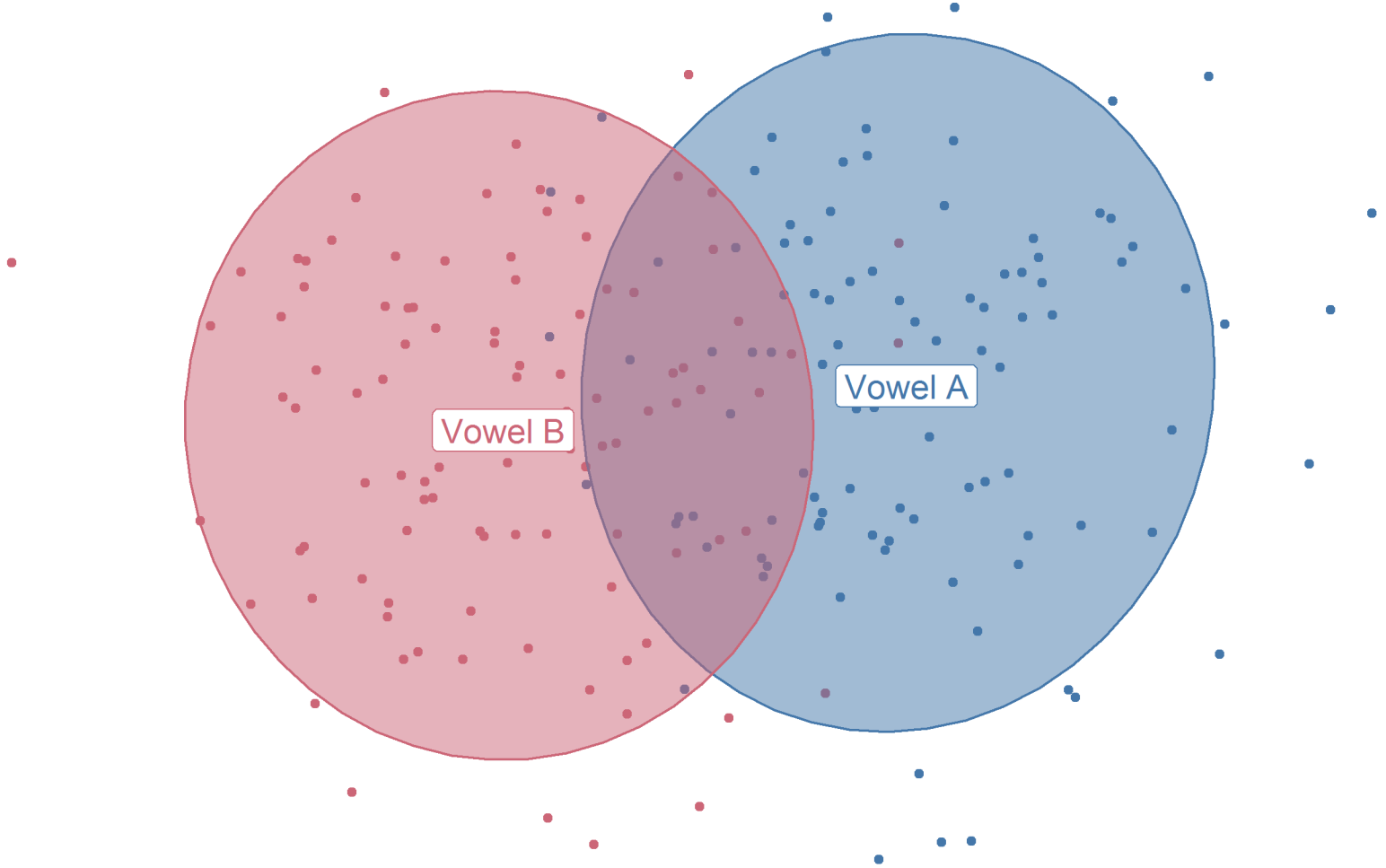
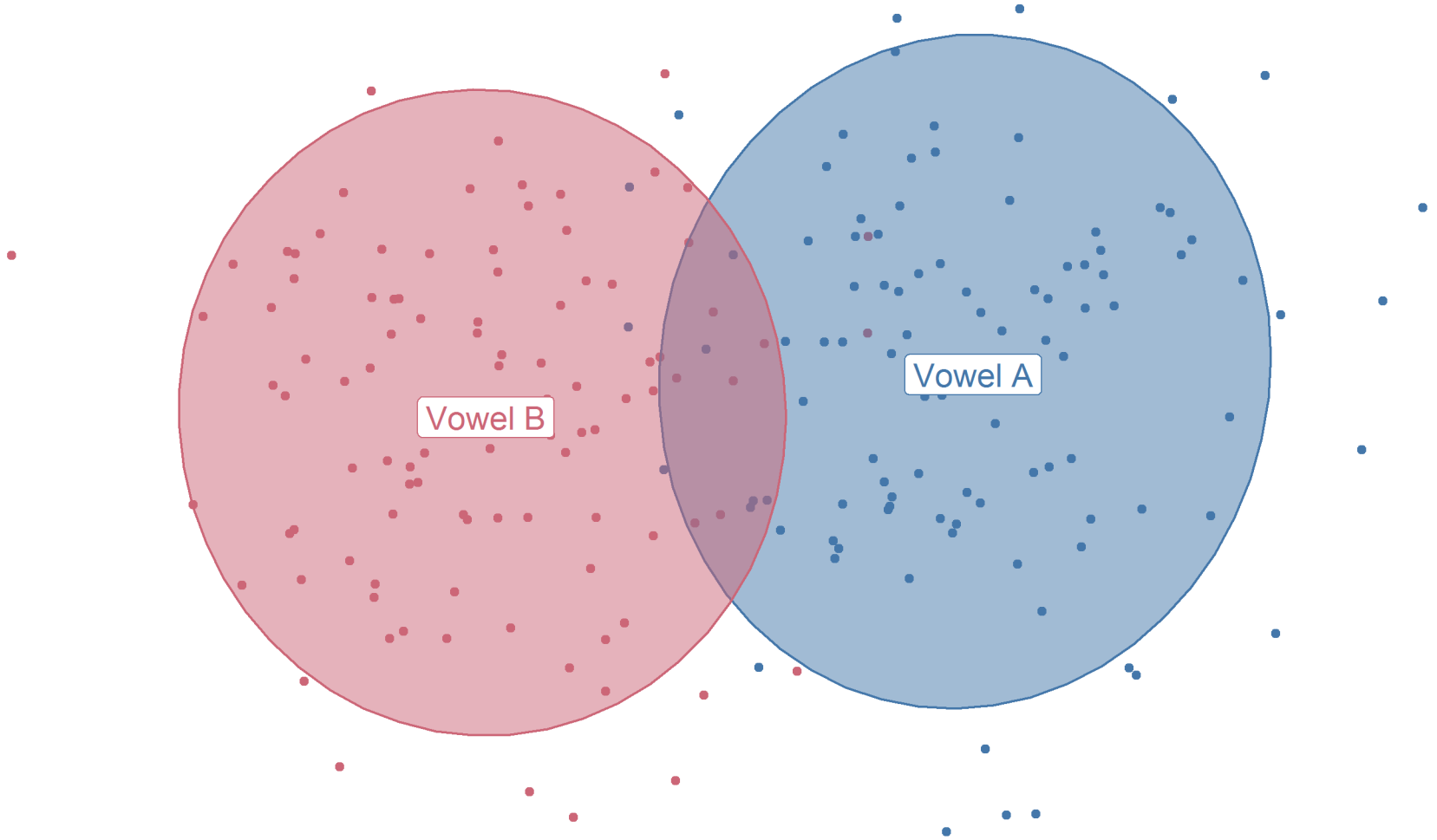
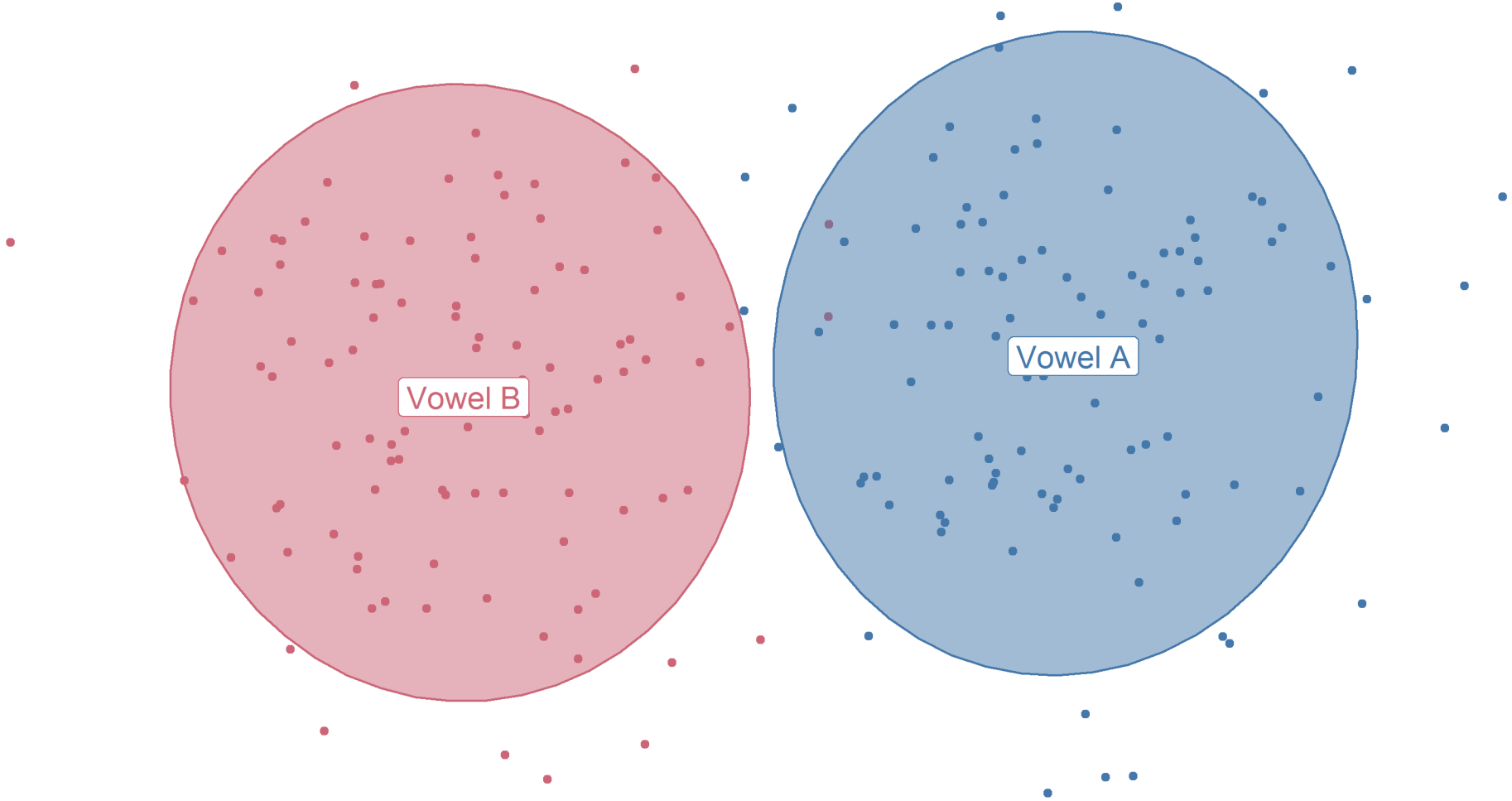


Pillai score: -0.7



Pillai score: -0.8



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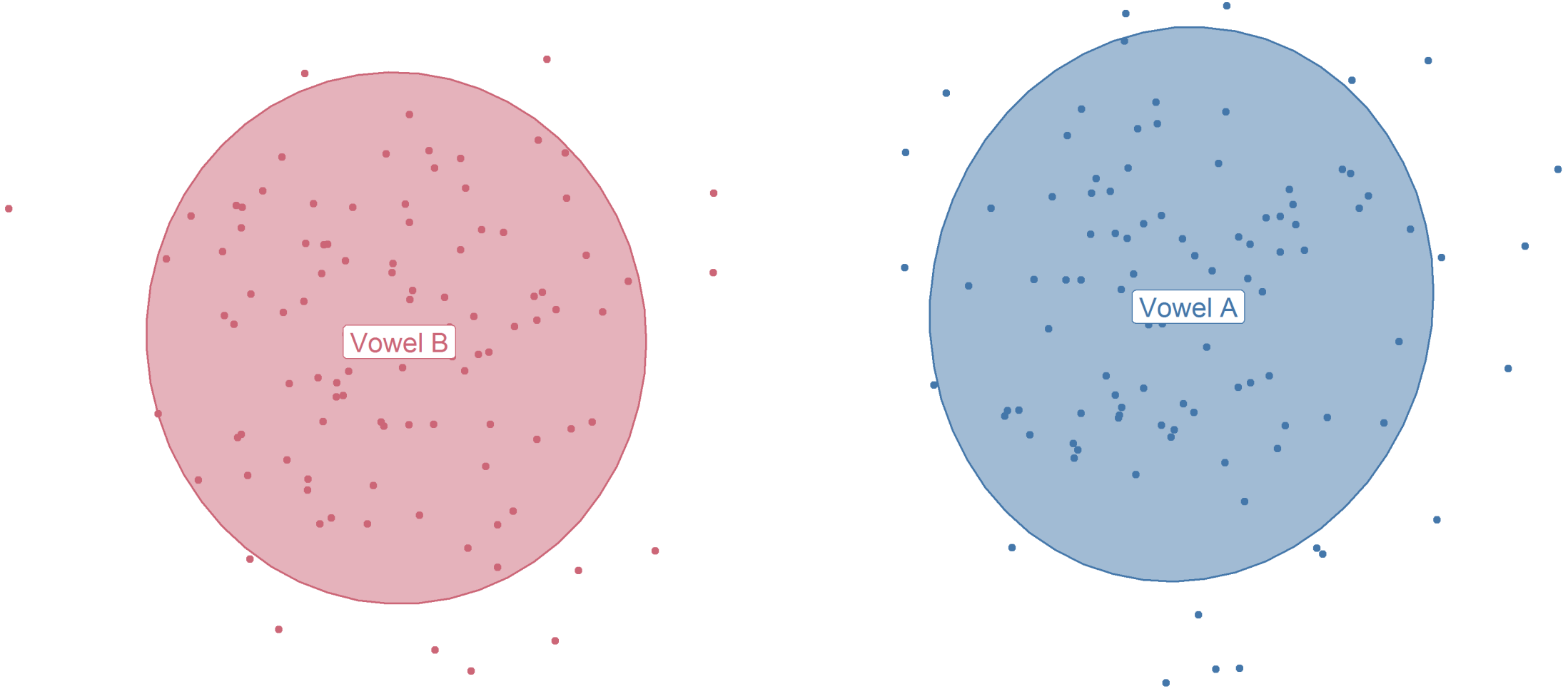

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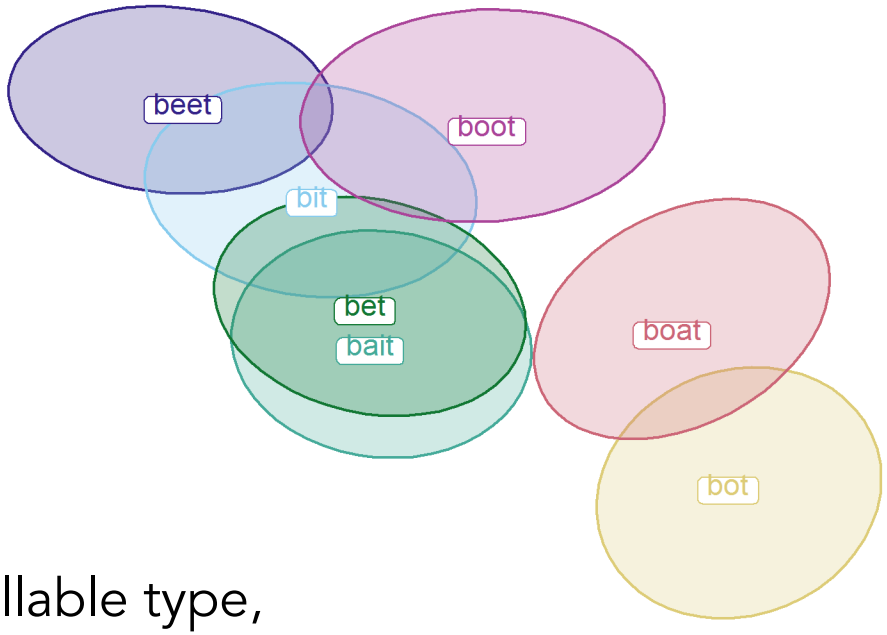
Analysis

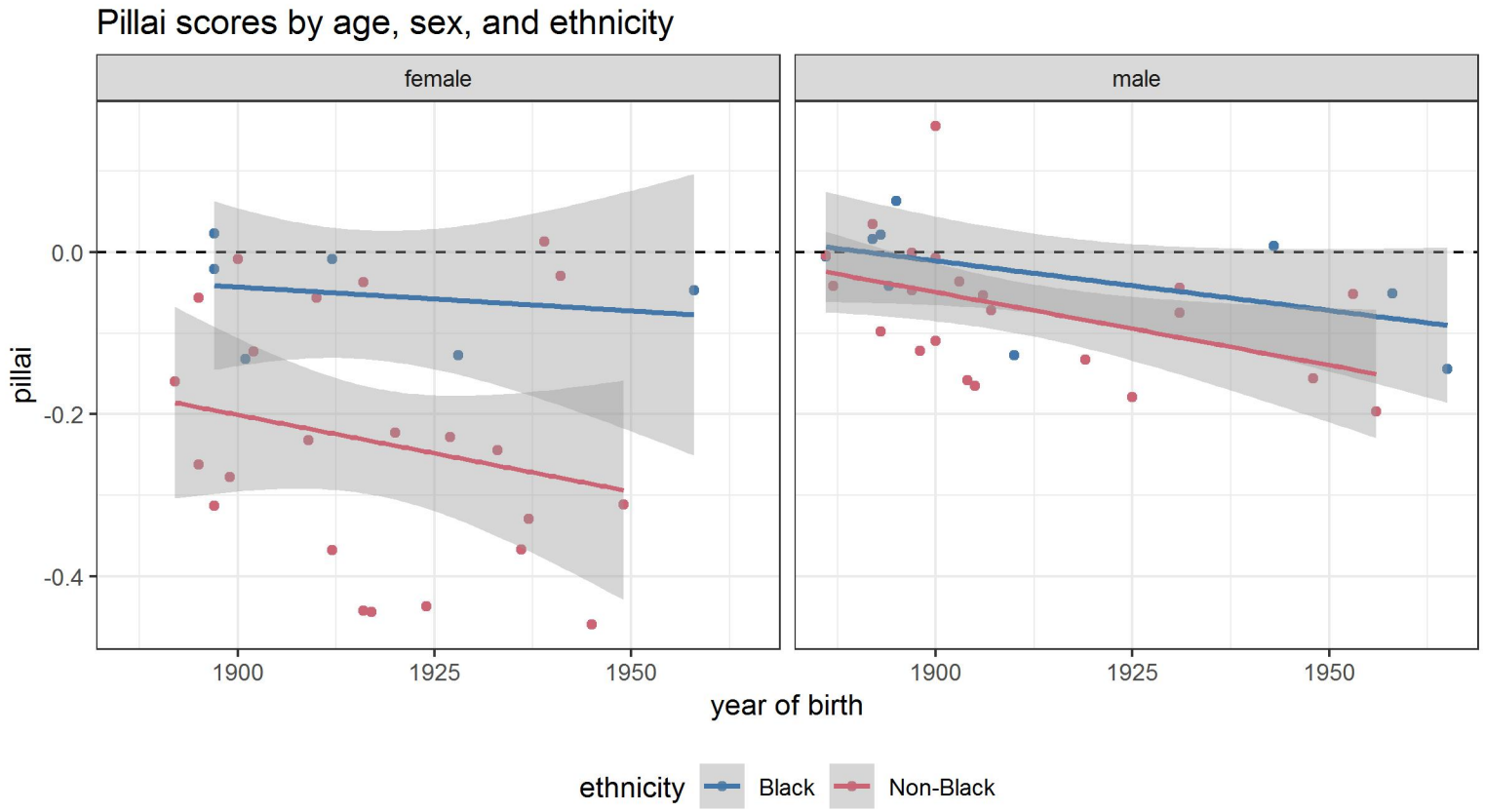
- Pillai scores between four pairs of vowels
  - Front vowel swapping
    - /i/ to /ɪ/
    - /eɪ/ to /ɛ/
  - Back vowel fronting
    - /u/ to /i/
    - /oʊ/ to /i/
  - Controlled for place, manner, and voicing of the following consonant, the previous segment, the syllable type, stress, and duration.
- Linear mixed effects models on those Pillai scores.
  - Speaker, word, and state as random effects.
  - Stepwise variable selection procedure.



FINDINGS

Front Vowels: /eɪ/ and/ɛ/

Younger people, women, and European Americans had lower Pillai scores (= more swapping)



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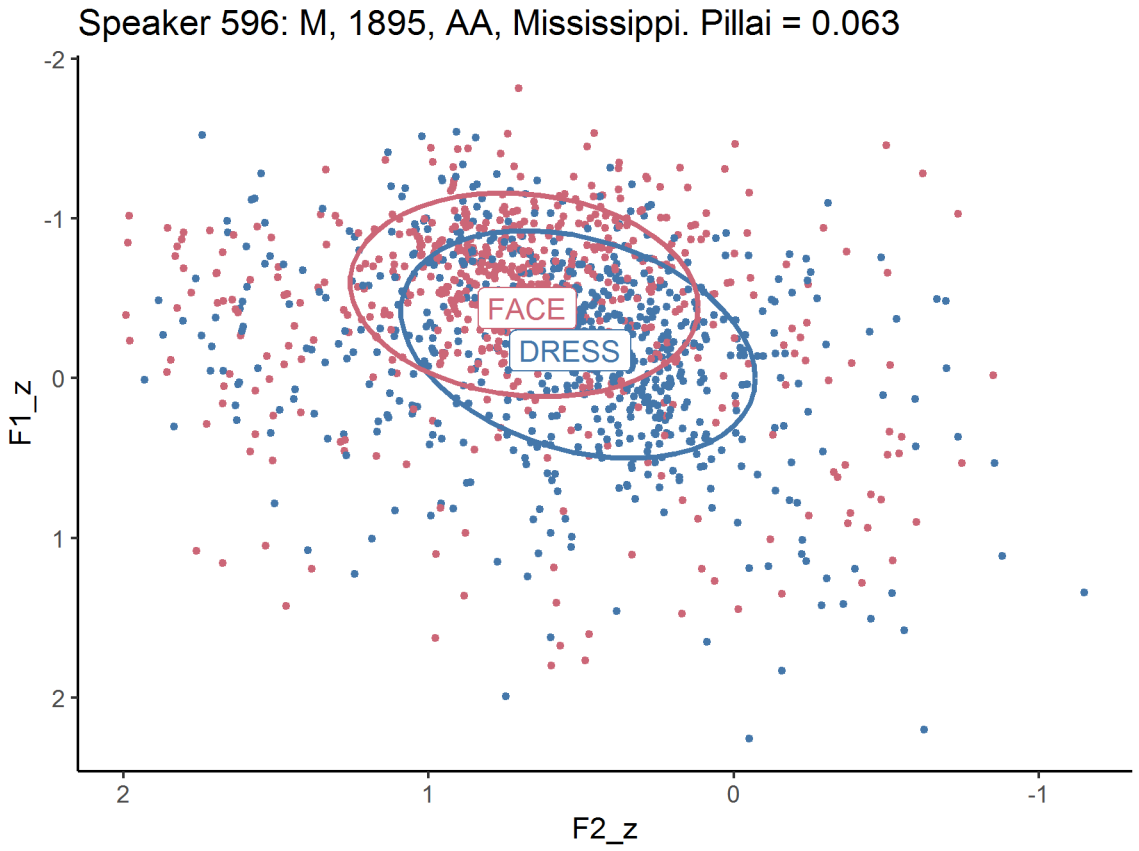
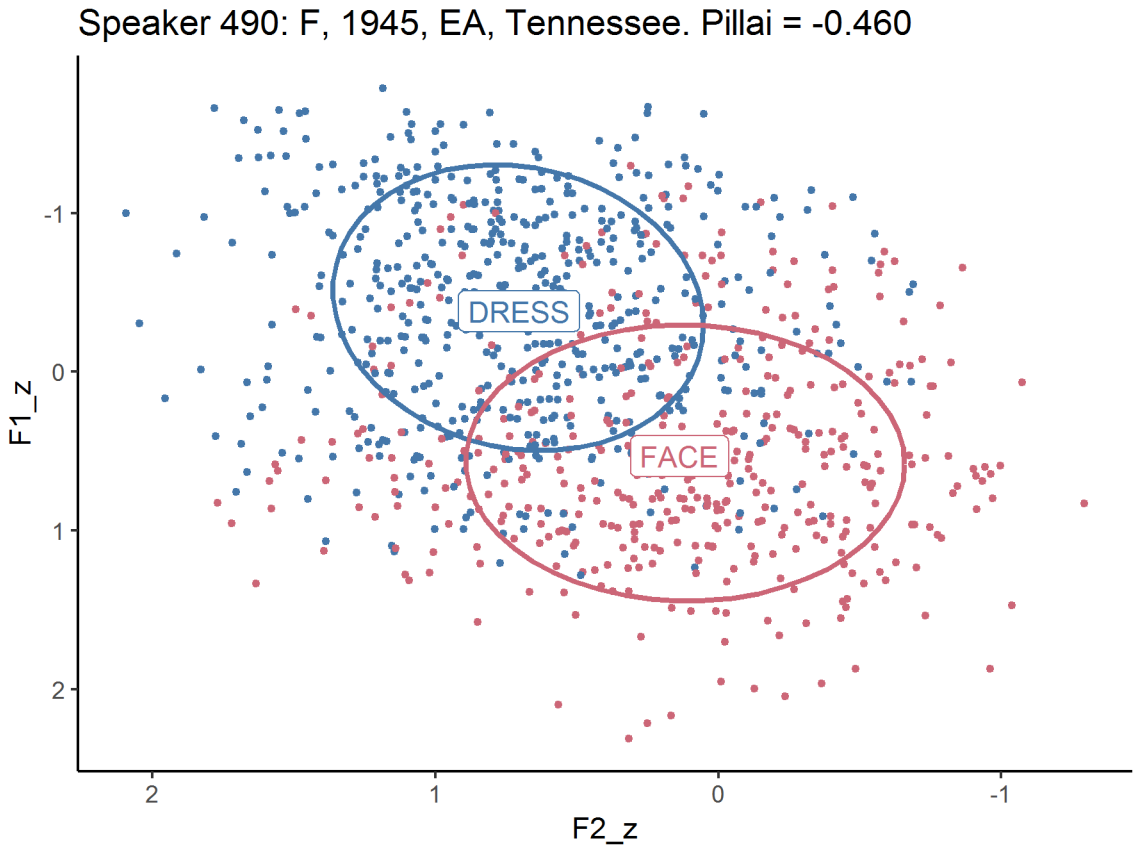
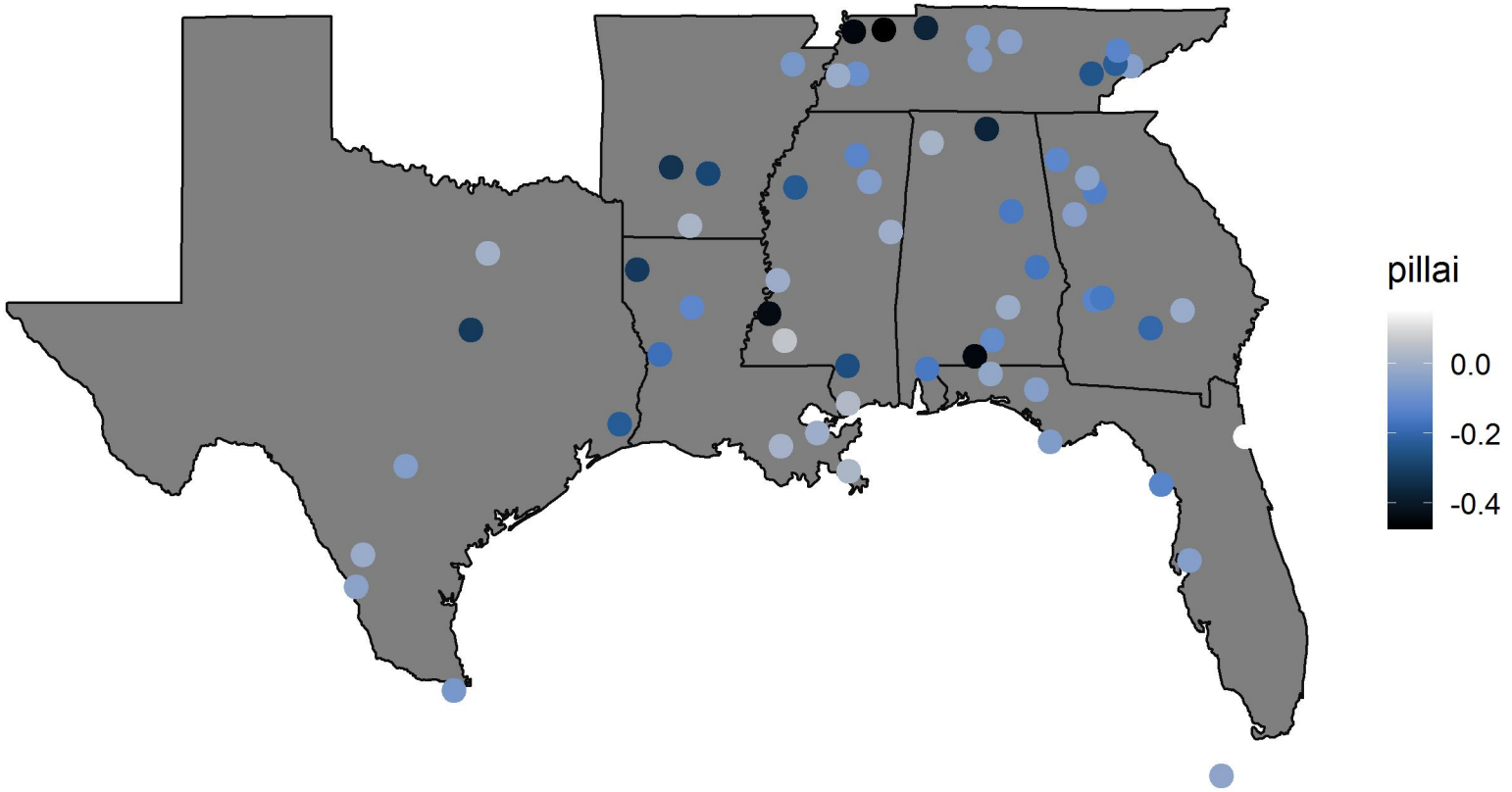




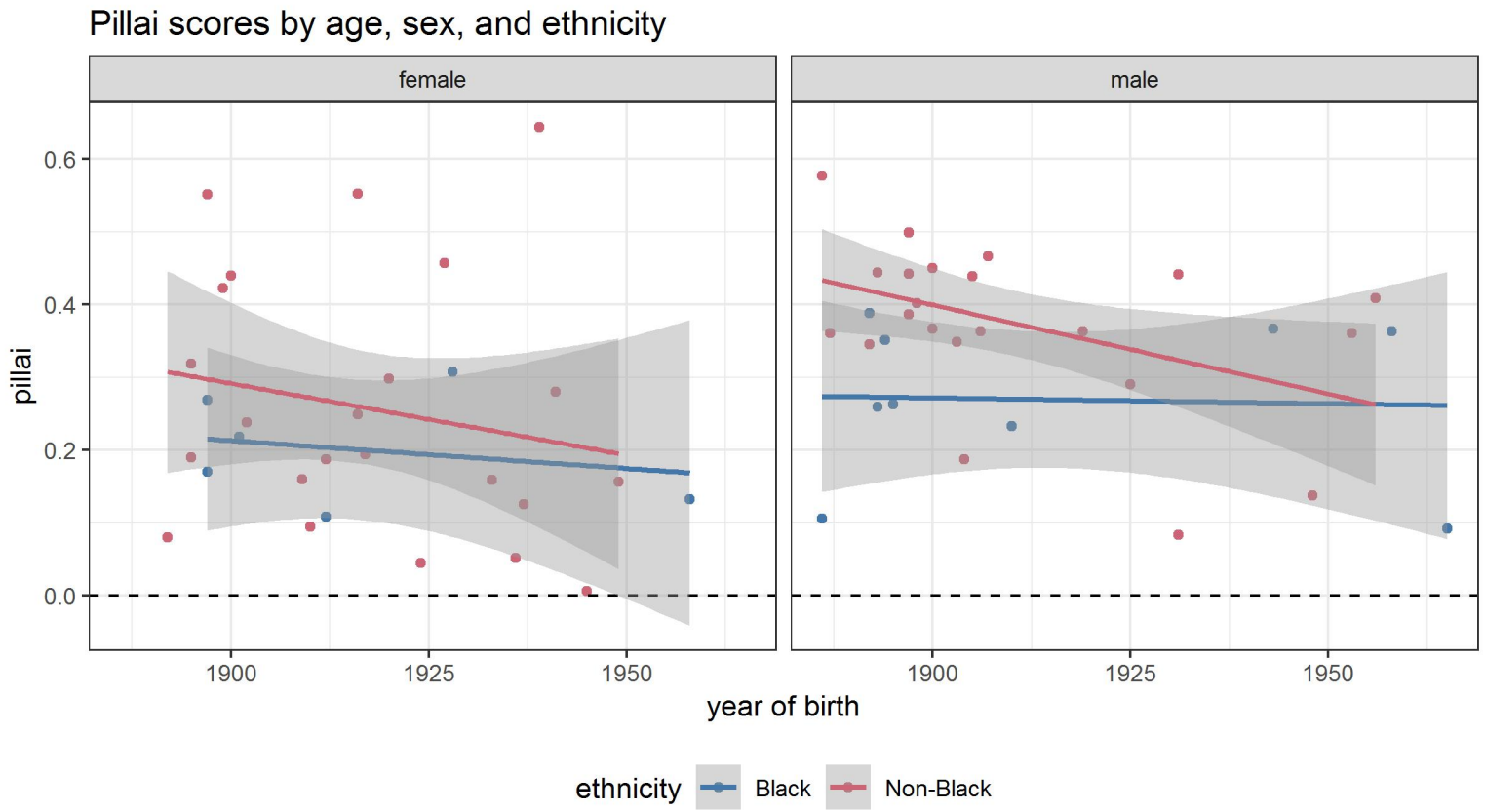
Front Vowels: /eɪ/ and/ɛ/

Less swapping in Texas and Louisiana



Front Vowels: /i/ and /ɪ/

Younger people, women, and African Americans had lower Pillai scores (= more overlap)



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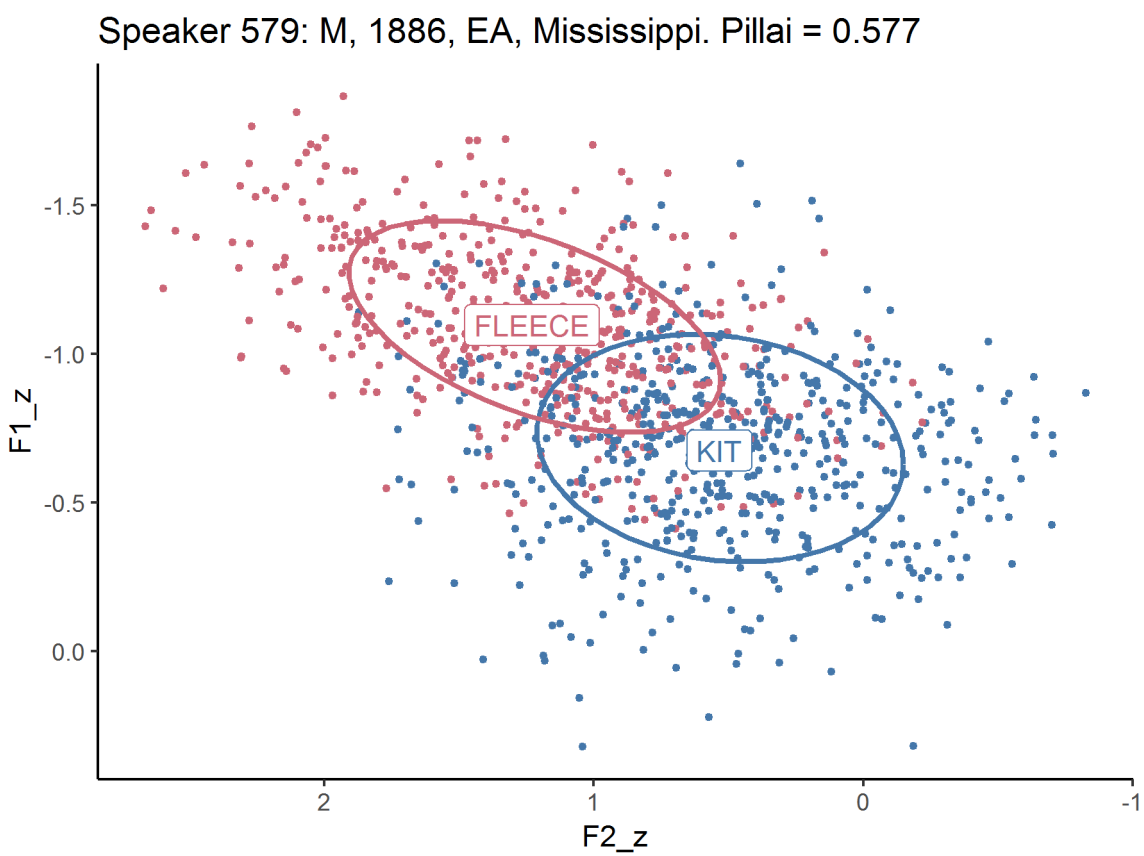
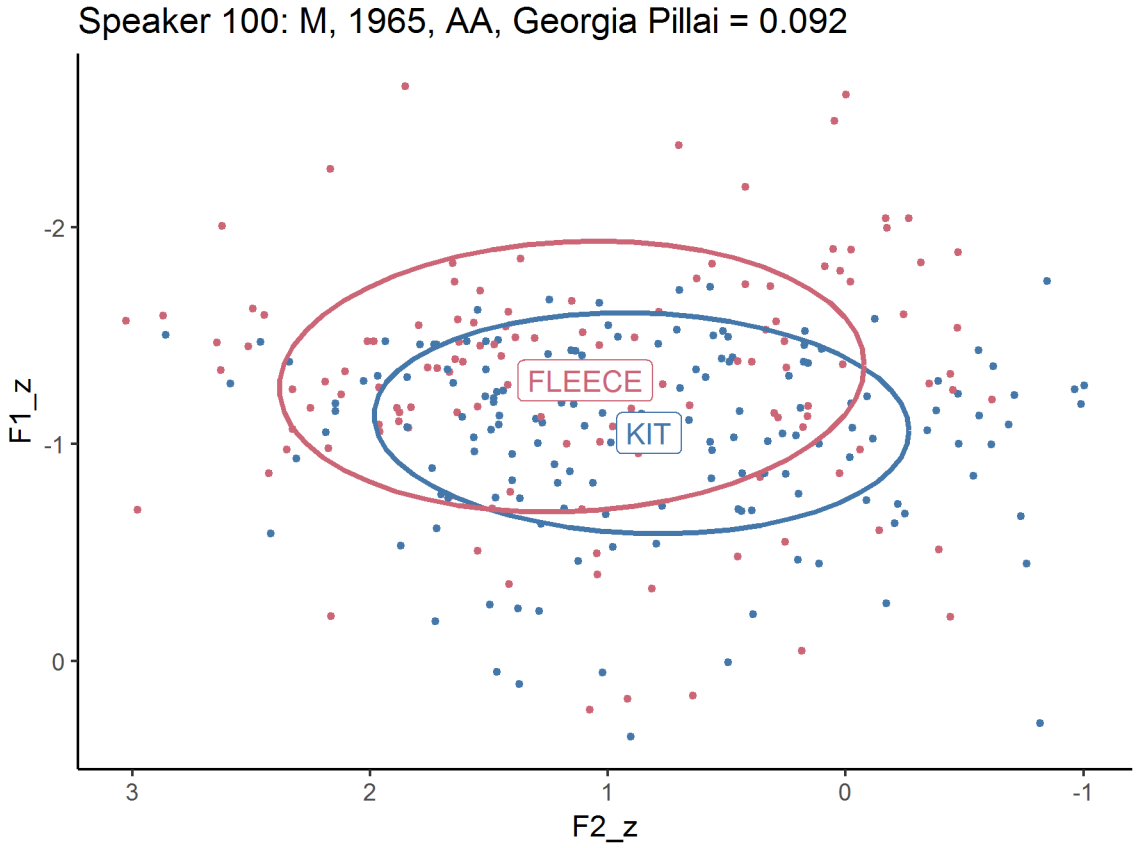
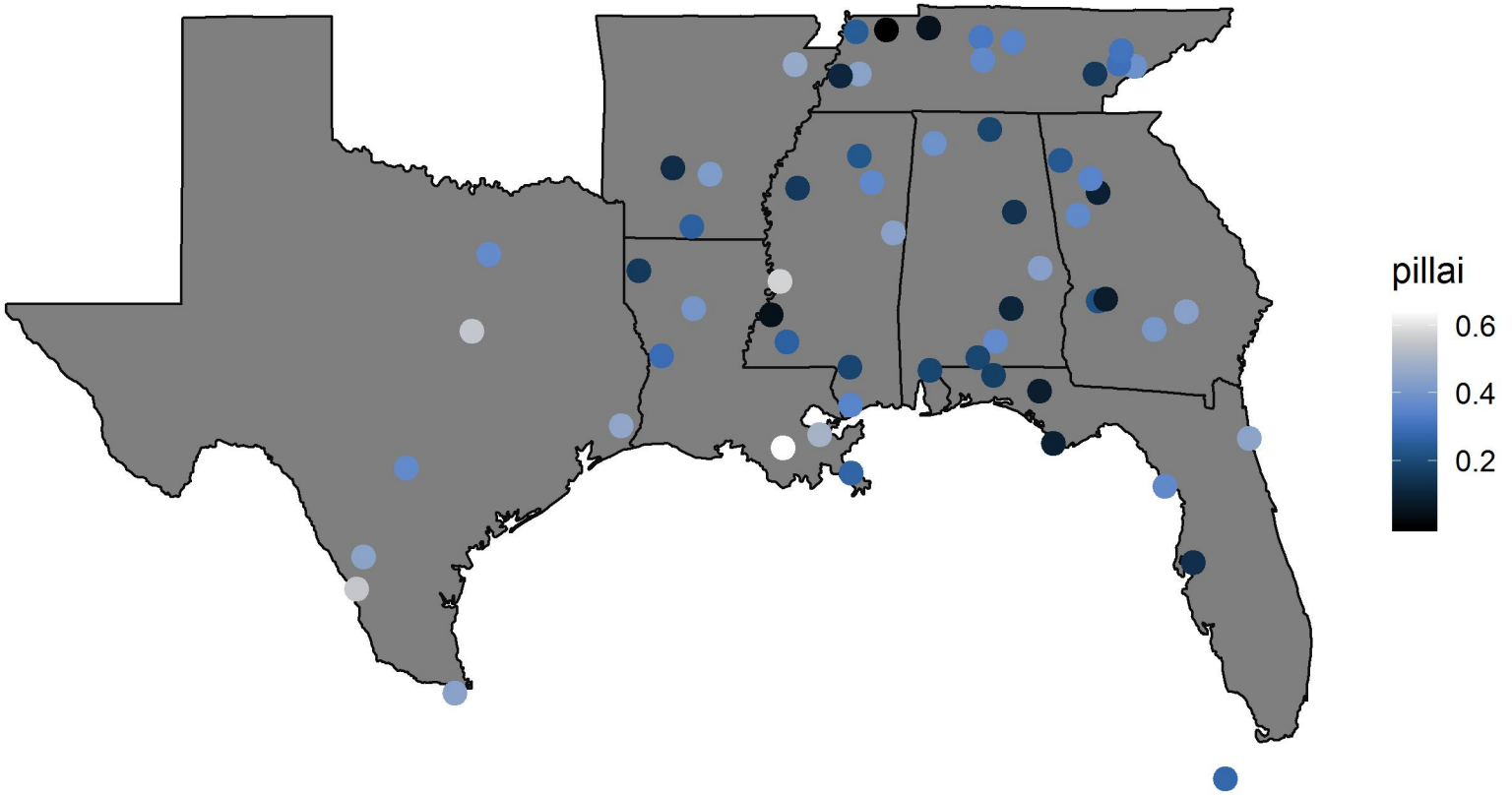




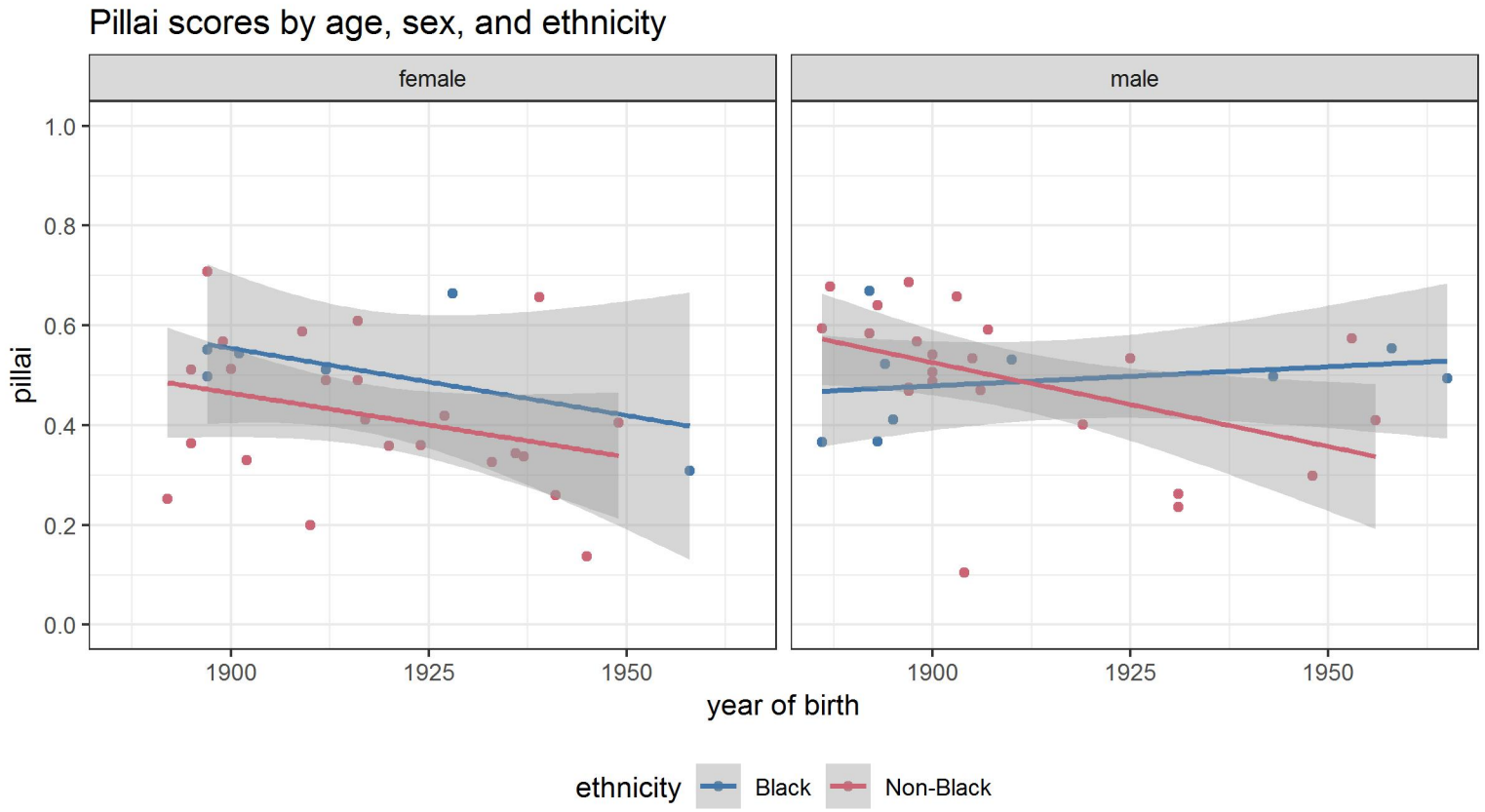
Front Vowels: /i/ and /ɪ/

Less swapping in Texas.



Back Vowels: /u/ and/i/

Younger, European Americans had lower Pillai scores (= more /u/-fronting).



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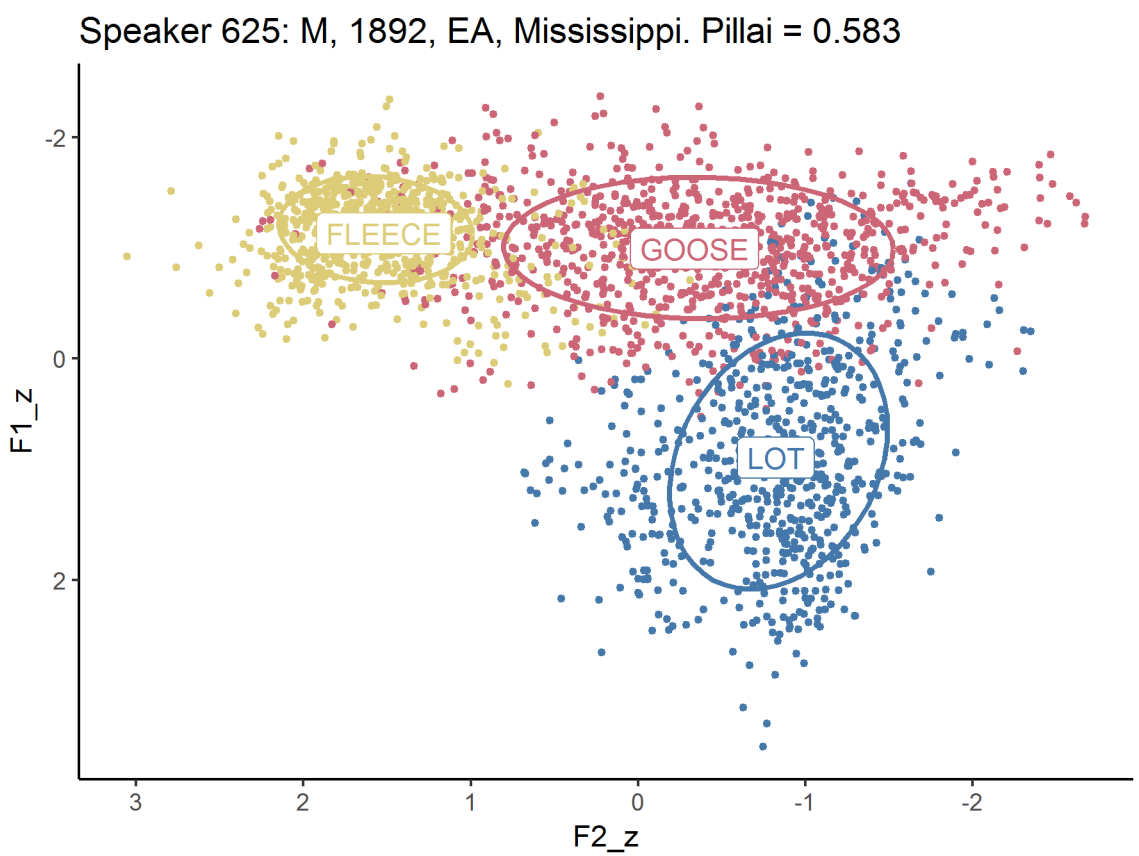
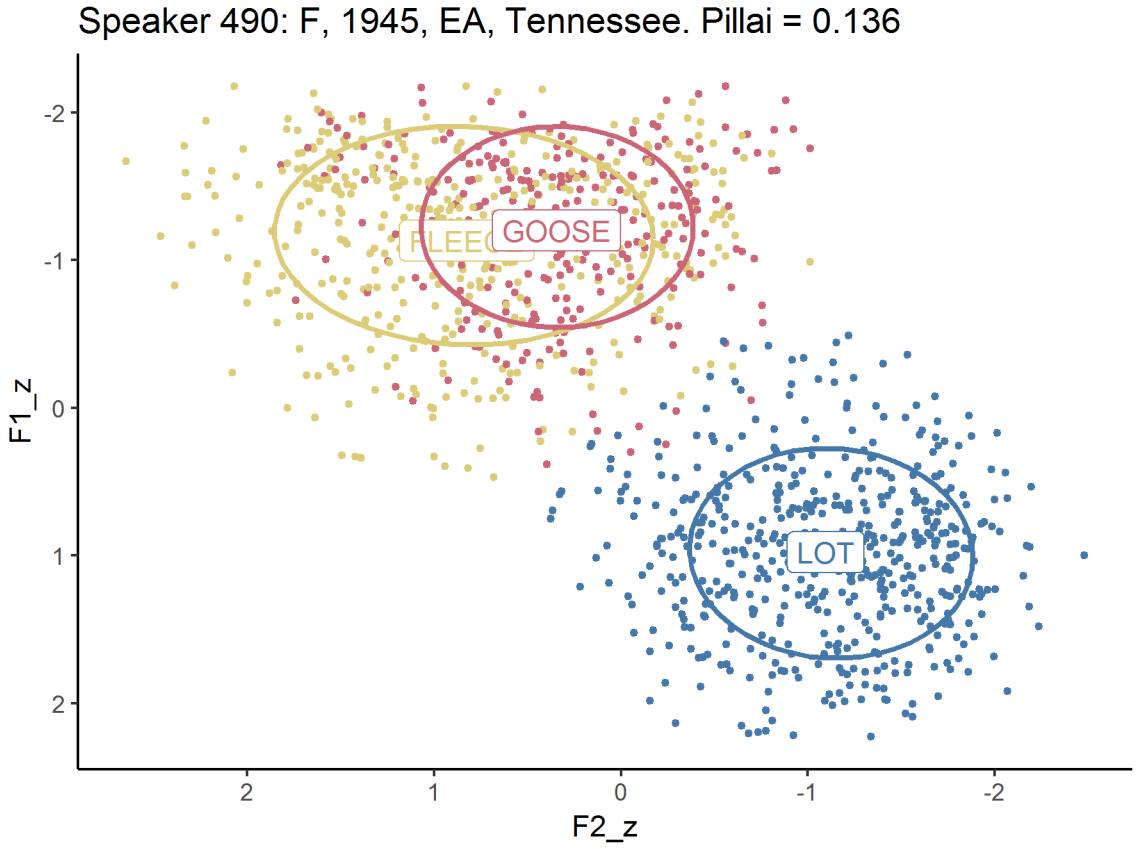
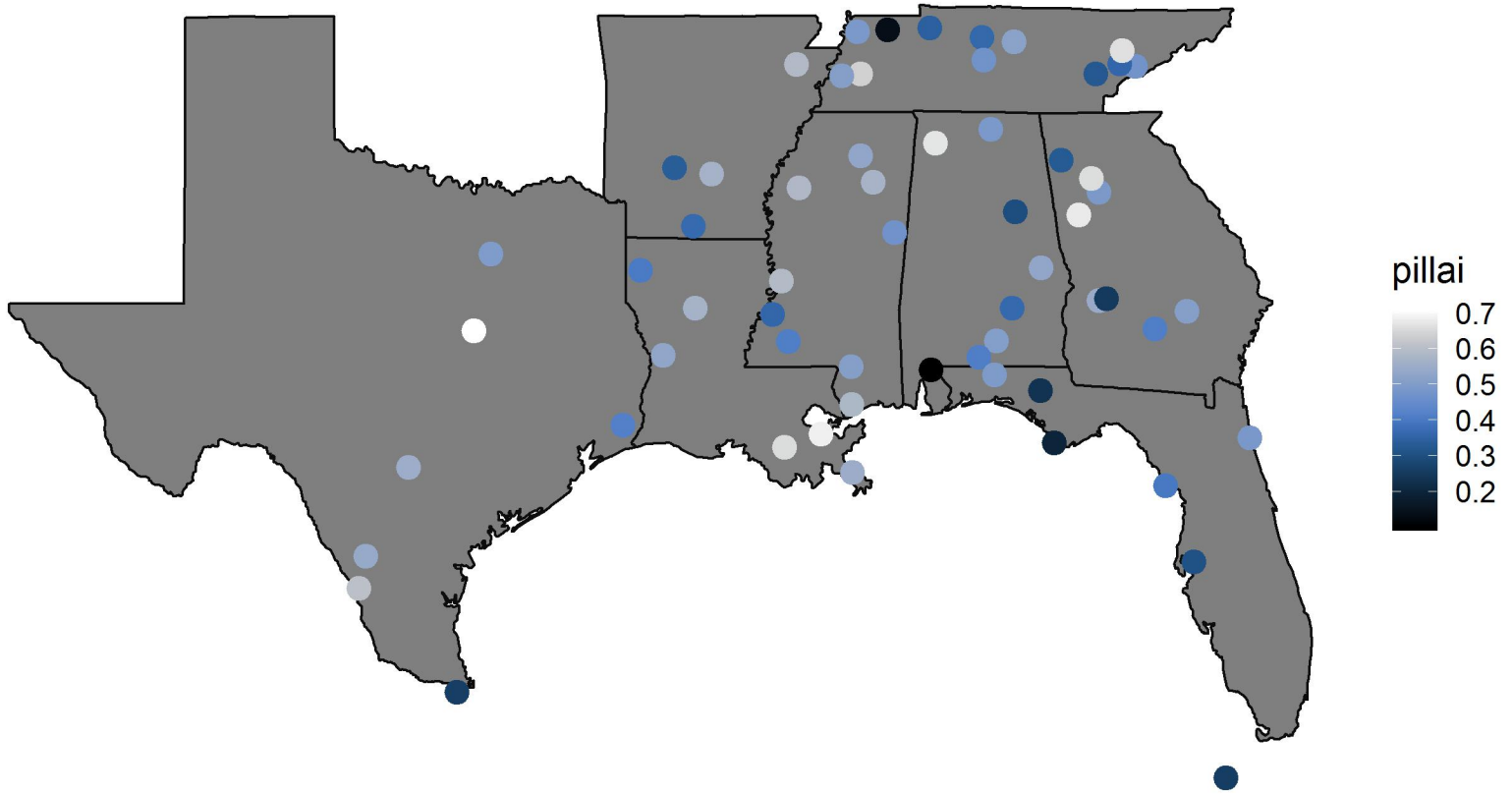




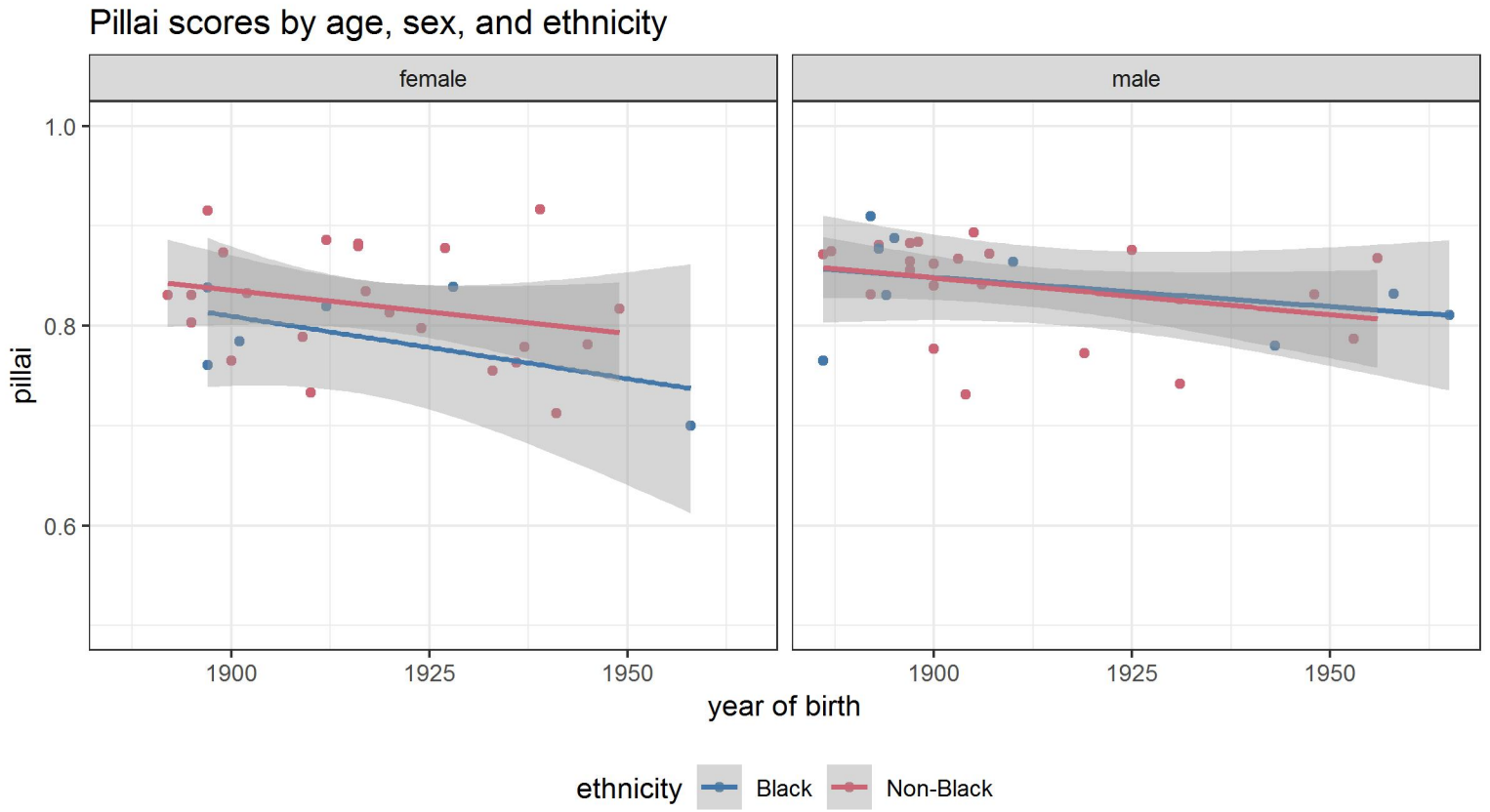
Back Vowels: /u/ and/i/

No region was statistically different from the others.



Back Vowels: /o/ and/i/

Younger people had lower Pillai scores (= more /o/-fronting)



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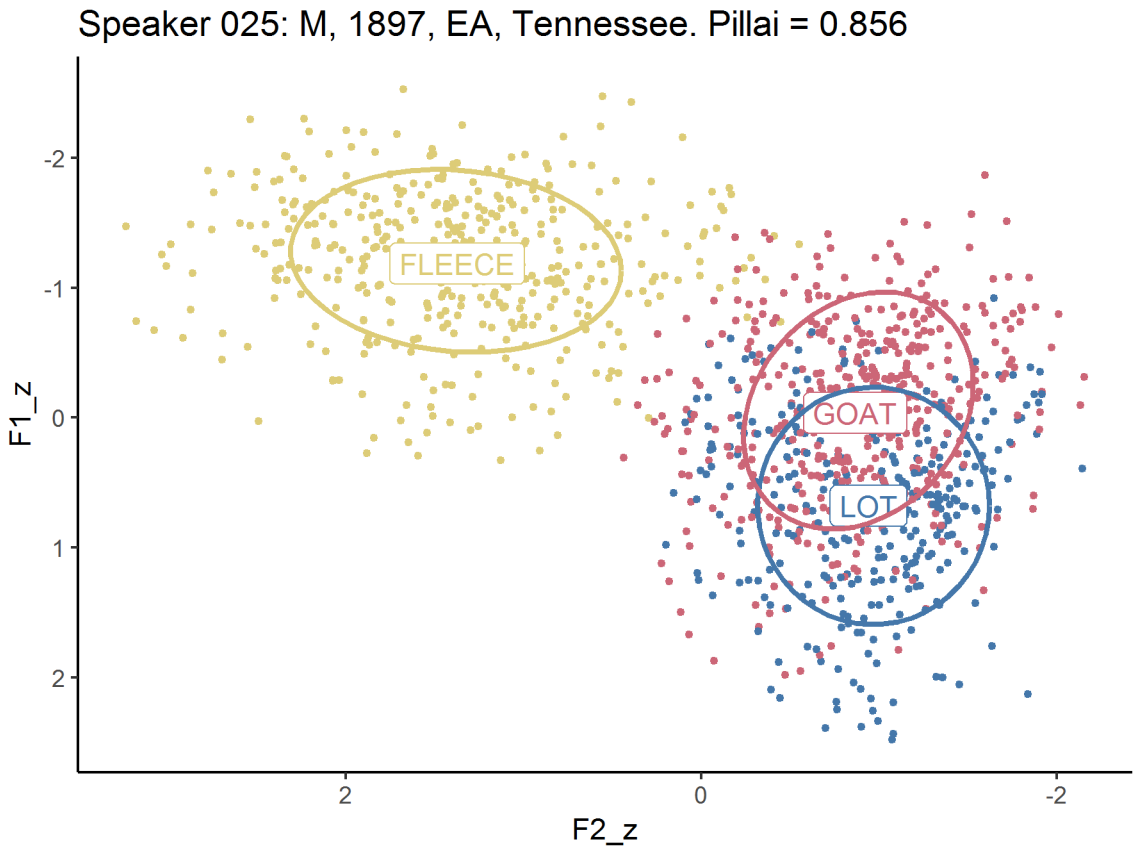
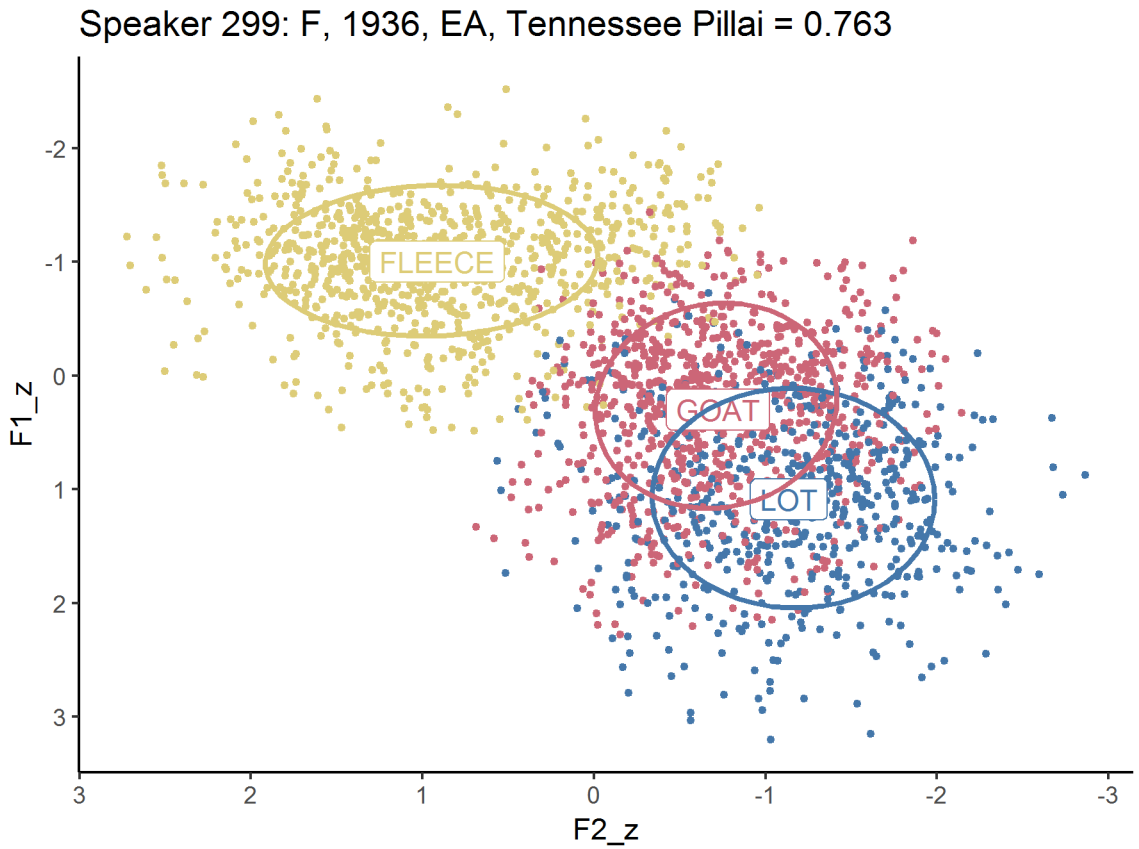
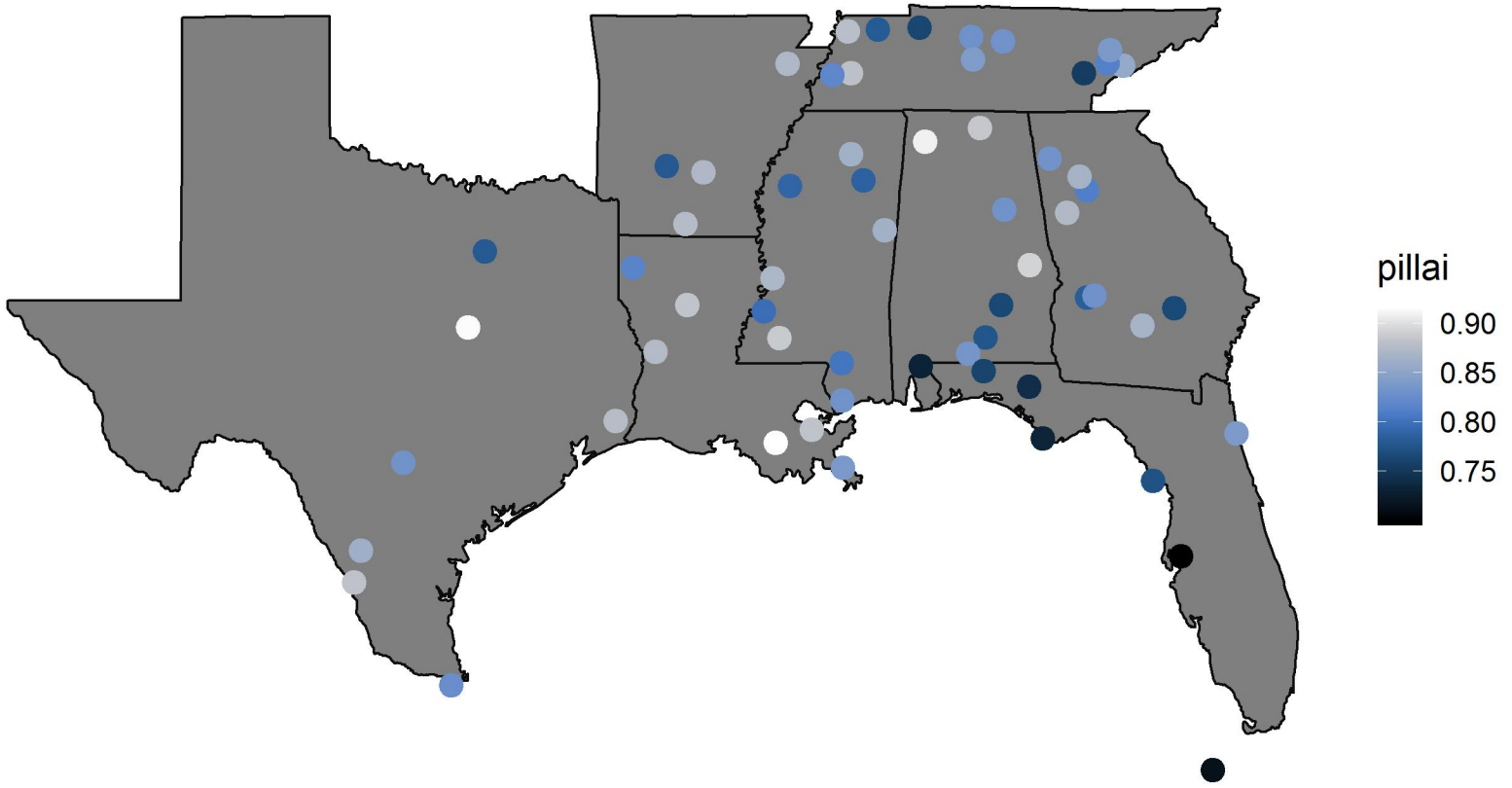




Back Vowels: /o/ and/i/

Slightly more fronting in Florida



Summary

- Front vowels
  - Younger, white women are swapping the front vowel pairs more.
    - Exactly as predicted: SVS has swapping but AAVS does not.
    - A female-led change in apparent time (Labov 1990)
  - Texas and Louisiana are lagging behind.

- Back vowels
  - Younger European Americans have more back vowel fronting.
    - As predicted: back vowel fronting not a part of AAVS.
  - Florida ahead of the curve.
    - That's okay because Southern Florida not linguistically Southern (Labov, Ash, & Boberg 2006)

Discussion

- It's hard to detect language change while it's happening.
  - Hindsight is 20-20 and older recordings serve as real-time evidence for change.
  - DASS speakers were born when southern speech was actively changing.

- DASS illuminates how the SVS and AAVS developed.
  - Vowels were not uniform
    - Swapping of /eɪ/ and/ɛ/ happened before /i/ and /ɪ/ did.
    - /u/ fronting is more drastic and advanced than /o/ fronting.
  - Social groups were not uniform
    - Younger women lead the front vowel swapping and older men lagged behind.
    - AA speakers not participating in back vowel fronting.
  - Regions were not uniform
    - Texas and Louisiana lagged behind in the swapping.
    - Florida leading in /o/ fronting.

Conclusion

- Main findings:
  - There is change in time.
  - Women are usually ahead.
  - Differences between ethnicities.

- Legacy corpora offer a unique look into the past and provide us with a view at the development of language change.

Acknowledgments

- Supported by NSF BCS #1625680
- We are grateful to the Linguistic Atlas Project at the University of Georgia for providing the data presented here
- Annotators & transcribers
- Our NSF / Atlas team

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