

# A [ʃ]triking change in Manchester English

UKLVC12

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# WHAT IS S-RETRACTION?

**S-retraction:** a process which turns */s/* into a more [ʃ]-like sound

- attested in /stʌ/ clusters in various positions:

word-initially

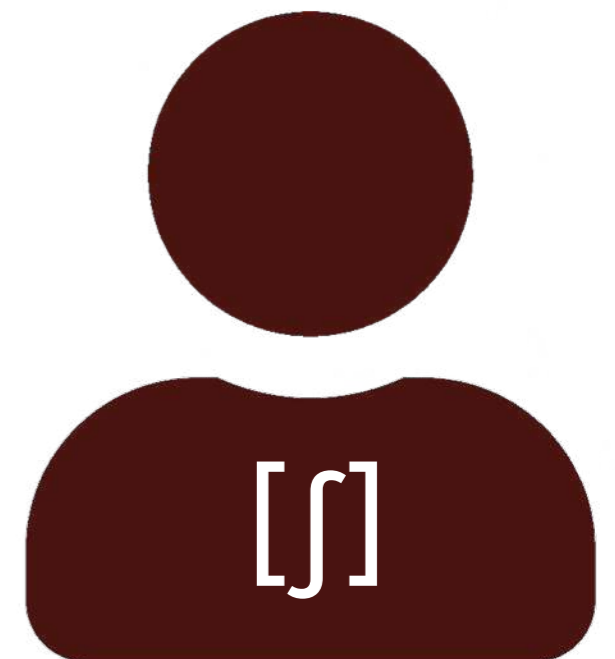
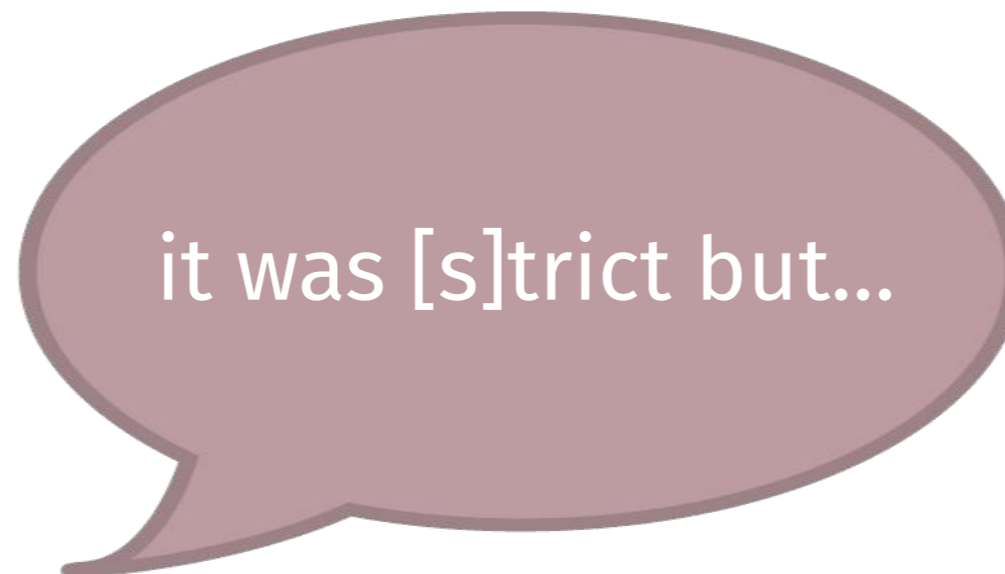
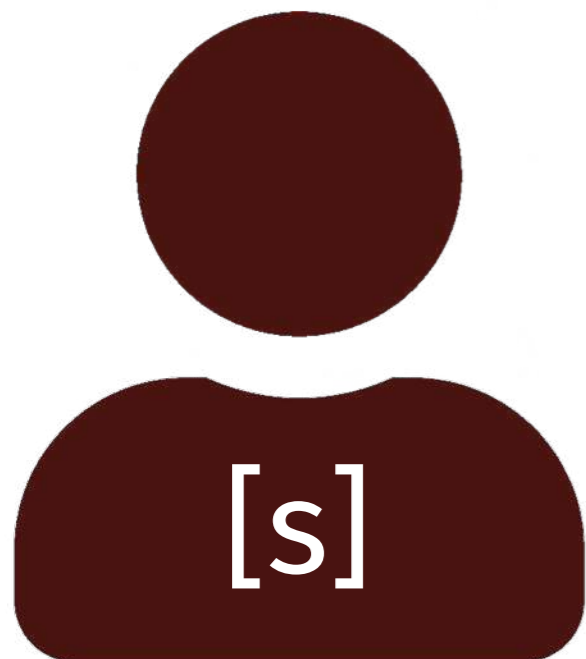
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word-medially

e.g. di[ʃ]trict

word-finally

e.g. cla[ʃ] trip



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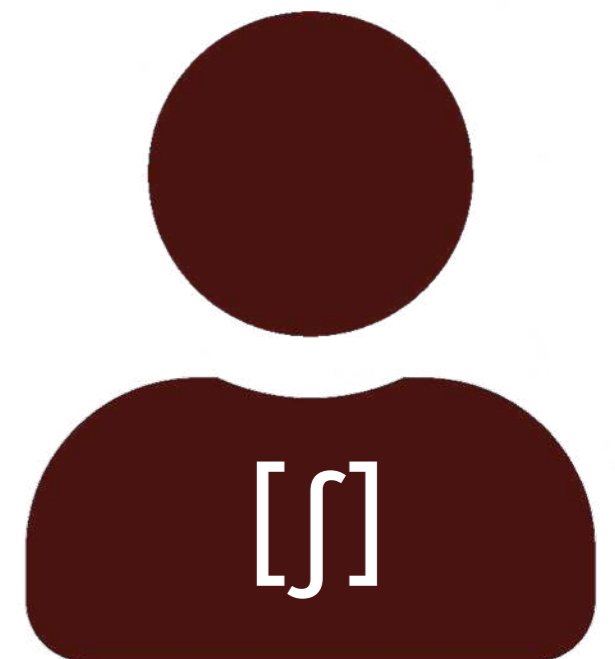
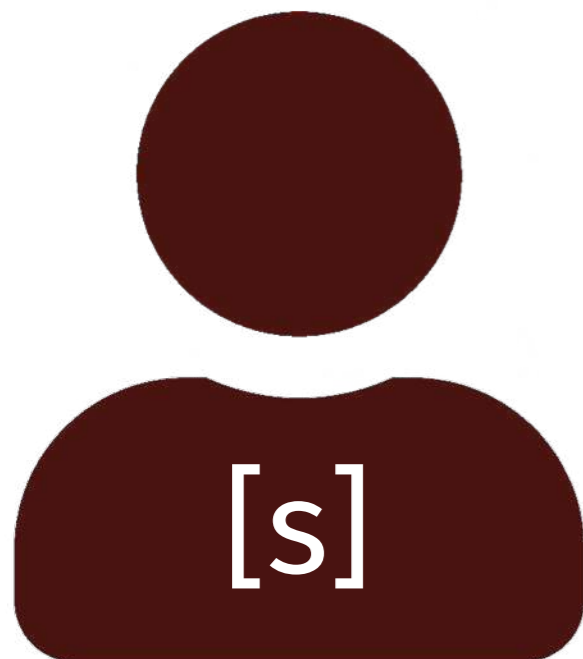
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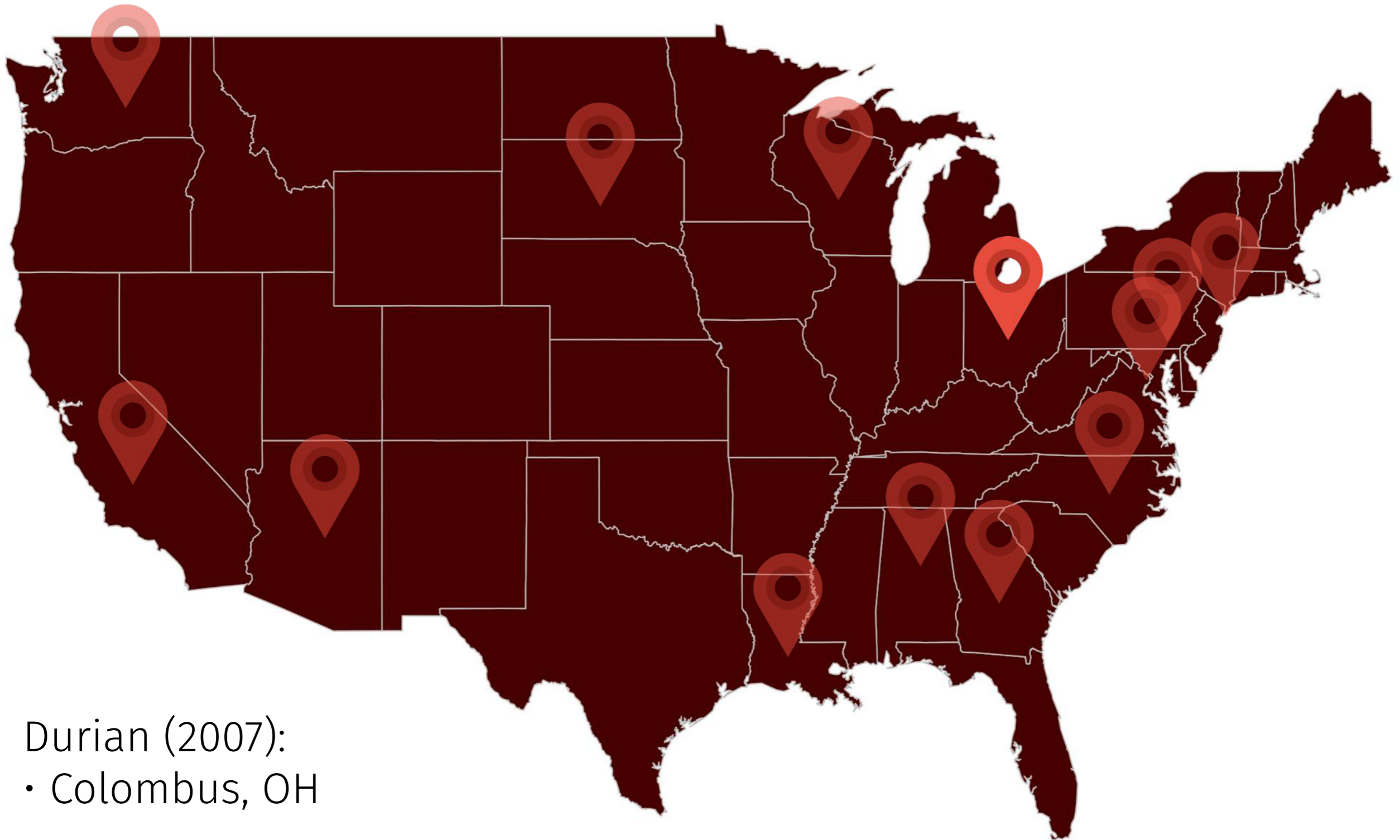
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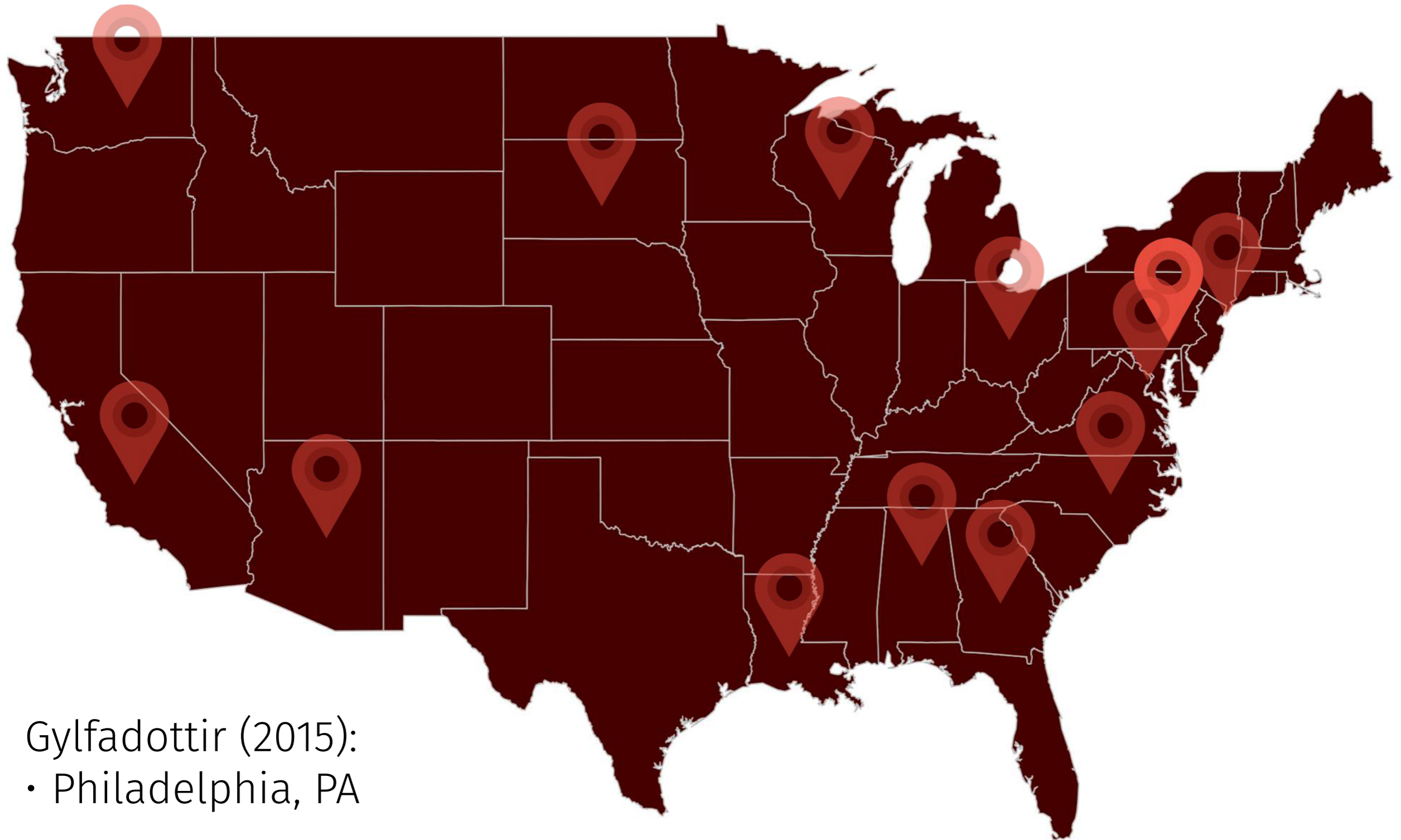
2019	Individual differences and sound change actuation: evidence from imitation and perception of English /str/	Stevens & Loakes
2019	Large-scale acoustic analysis of dialectal and social factors in English /s/-retraction.	Stuart-Smith et al.
2019	Associating the origin and spread of sound change using agent-based modelling applied to /s/-retraction in English.	Stevens, Harrington & Schiel
2019	Sound change and coarticulatory variability involving English /ɹ/.	Smith et al.
2019	Listeners' social attributes influence sensitivity to coarticulation in the perception of sibilants in nonce words.	Phillips & Resnick
2018	Back to Bins- a mixed-methods reevaluation of categorization in sociophonetics.	Ahlers
2018	Revealing covert articulation in s-retraction	Nichols & Bailey
2018	A midsagittal ultrasound tongue imaging study to investigate the degree of /s/-retraction in /stɹ/ onset clusters in British English	Wilson
2017	Social and Structural Constraints on a Phonetically-Motivated Change in Progress: (str) Retraction in Raleigh, NC	Wilbanks
2017	In situ perspectives on retraction – Austinites on Troublemaker Shtreet	Ahlers & Bergs
2017	A corpus and articulatory study of covert articulatory variation and its phonological consequences in Raleigh, NC English	Mielke, Smith & Fox
2016	Sibilants and ethnic diversity: A sociophonetic study of palatalized /s/ in STR clusters among Hispanic, White, and African-American speakers of Texas and Pittsburgh English	Hinrichs et al.
2016	The phonetic origins of s-retraction: Acoustic and perceptual evidence from Australian English	Stevens & Harrington
2016	An Apparent Time Study of (str) Retraction and /tɹ/ - /dɹ/ Affrication in Raleigh, NC English	Magloughlin & Wilbanks
2016	Phonological and prosodic conditioning of /s/-retraction in American English	Phillips
2015	Shtreets of Philadelphia: An Acoustic Study of /str/-retraction in a Naturalistic Speech Corpus	Gylfadottir
2013	STR-palatalisation in Edinburgh accent: A sociophonetic study of a sound change in progress	Sollgan
2011	Variability in American English s-retraction suggests a solution to the actuation problem	Baker, Archangeli & Mielke
2011	Acoustic analysis of a sound change in progress: The consonant cluster /stɹ/ in English	Rutter
2010	Variability and homogeneity in American English /ɹ/ allophony and /s/ retraction	Mielke, Baker & Archangeli
2009	Street or shtreet? Investigating (str-) palatalisation in Colchester English	Bass
2007	Getting [ʃ]tronger Every Day?: More on Urbanization and the Socio-geographic Diffusion of (str) in Columbus, OH	Durian
2003	/s/-retraction in the ViC corpus	Armstrong
2000	/str/ → /ftr/: Assimilation at a distance?	Lawrence
1995	A case of distant assimilation: /str/ → /ftr/	Shapiro

# GEOGRAPHIC SPREAD



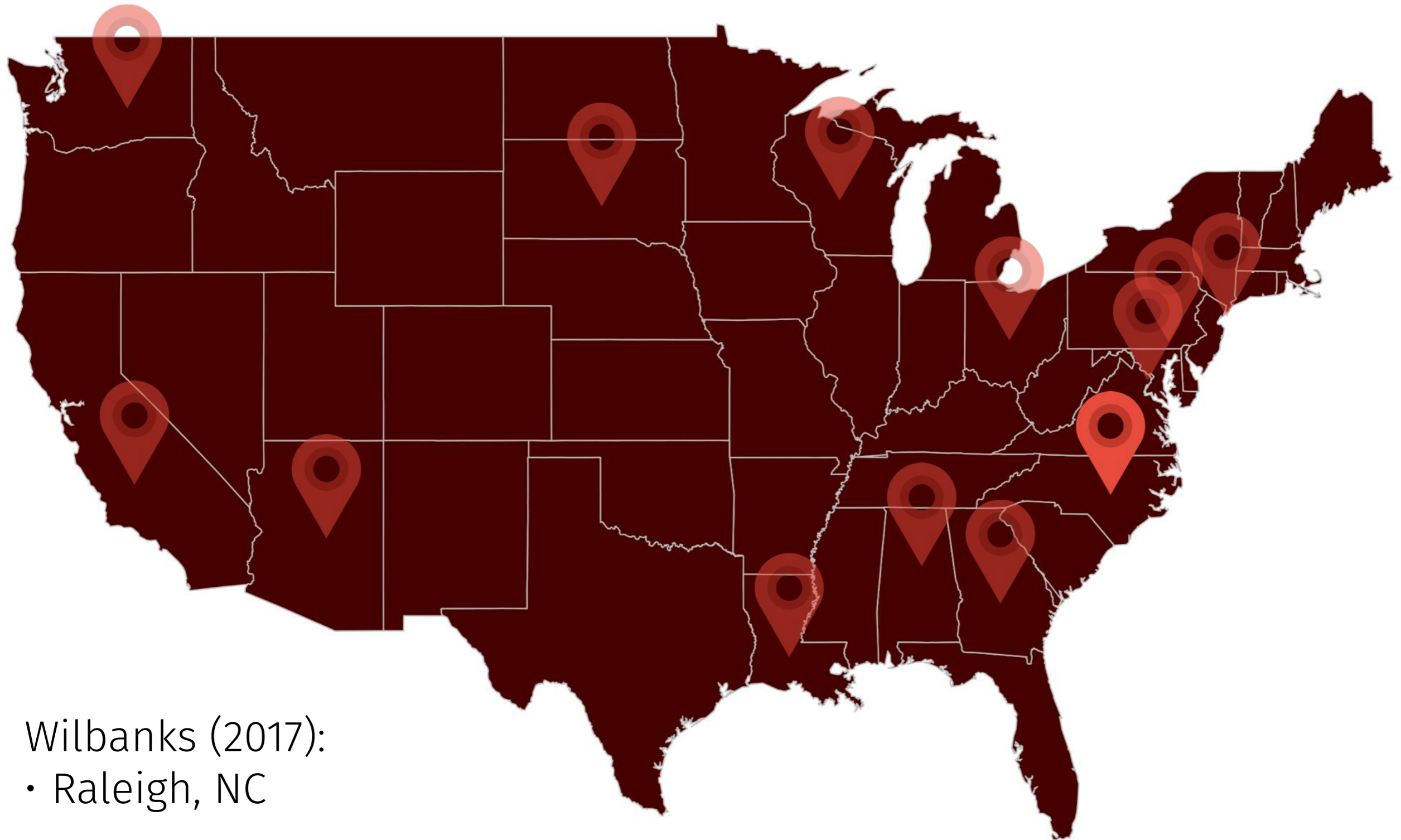
Durian (2007):  
• Columbus, OH

# GEOGRAPHIC SPREAD



Gylfadottir (2015):  
• Philadelphia, PA

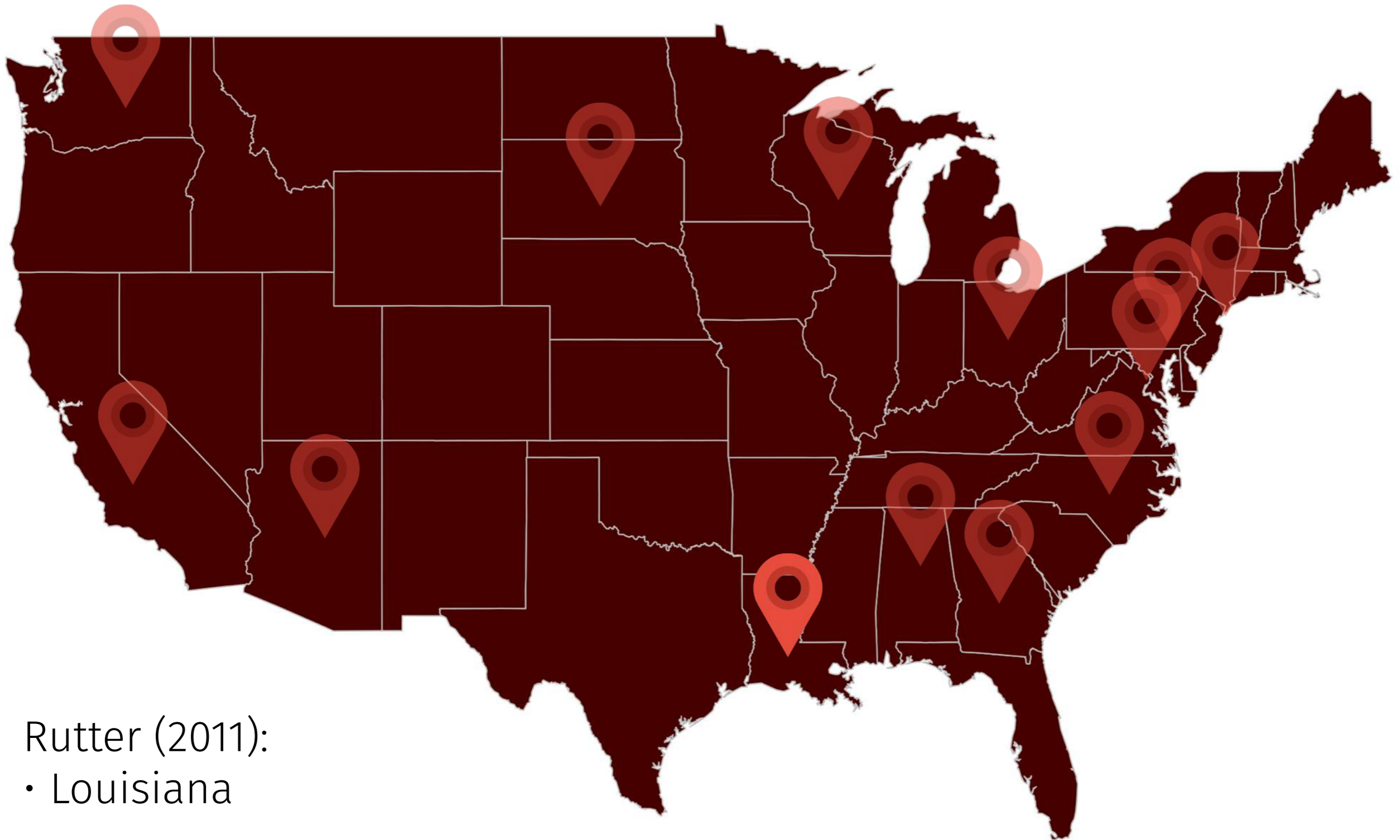
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Wilbanks (2017):

- Raleigh, NC

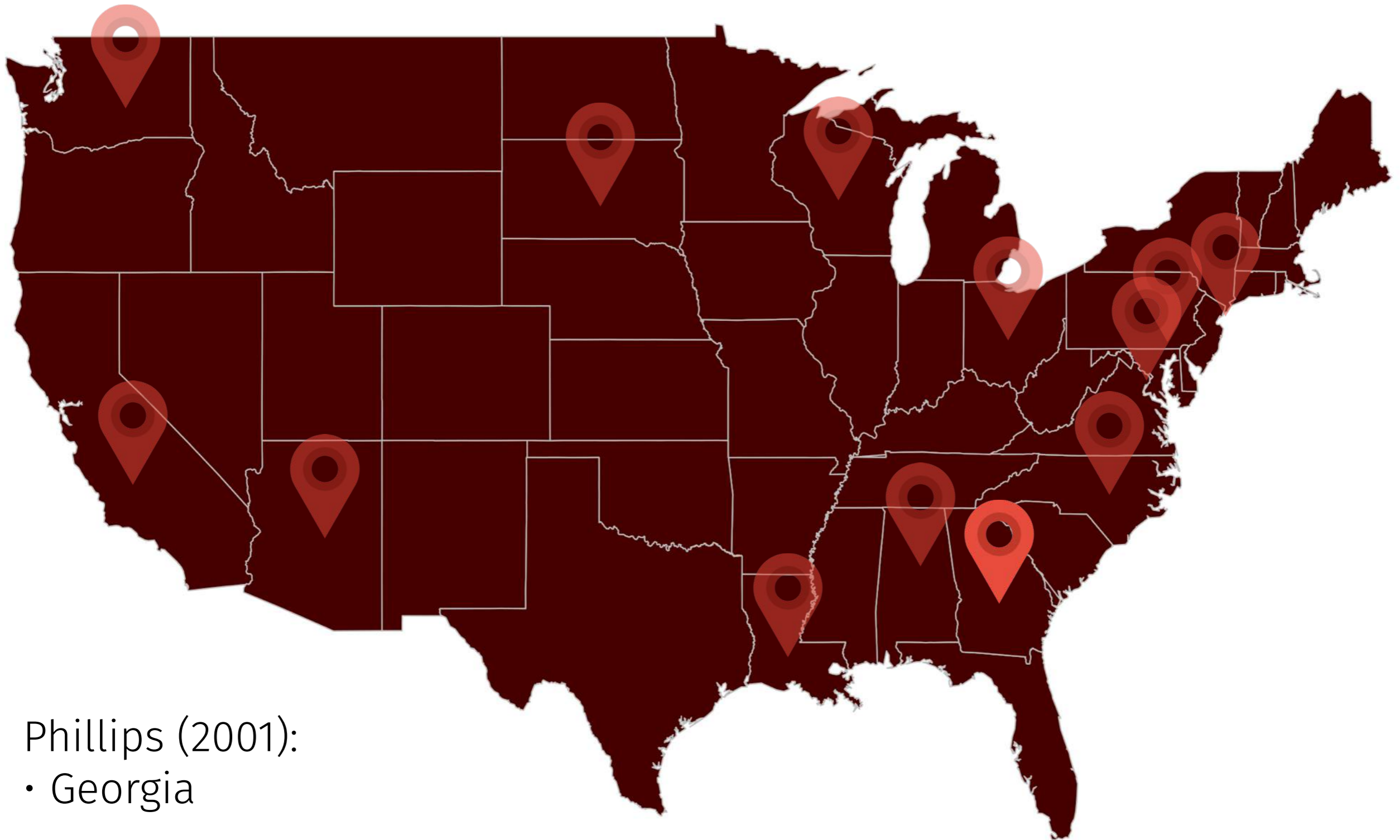
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Rutter (2011):  
• Louisiana



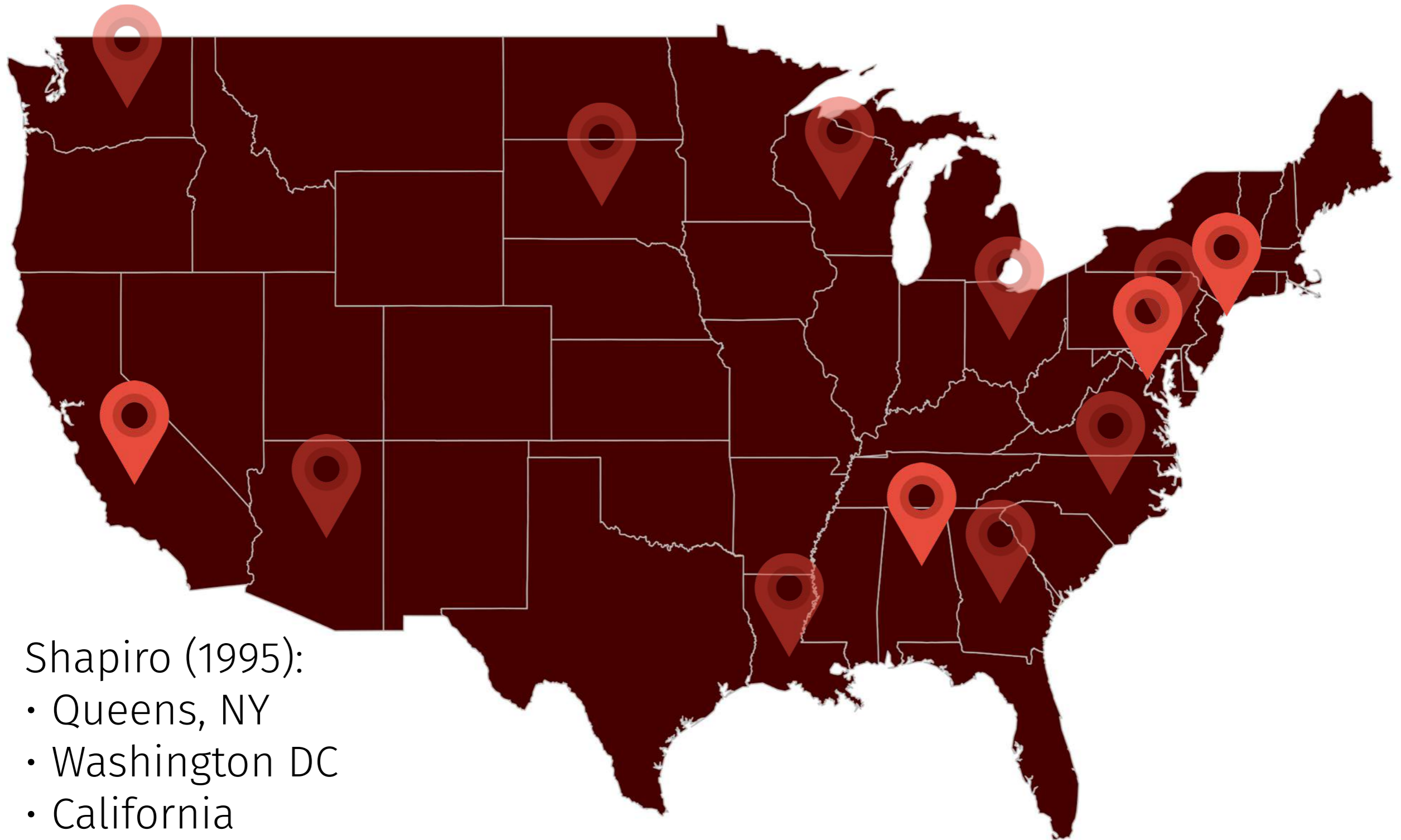
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Phillips (2001):

- Georgia

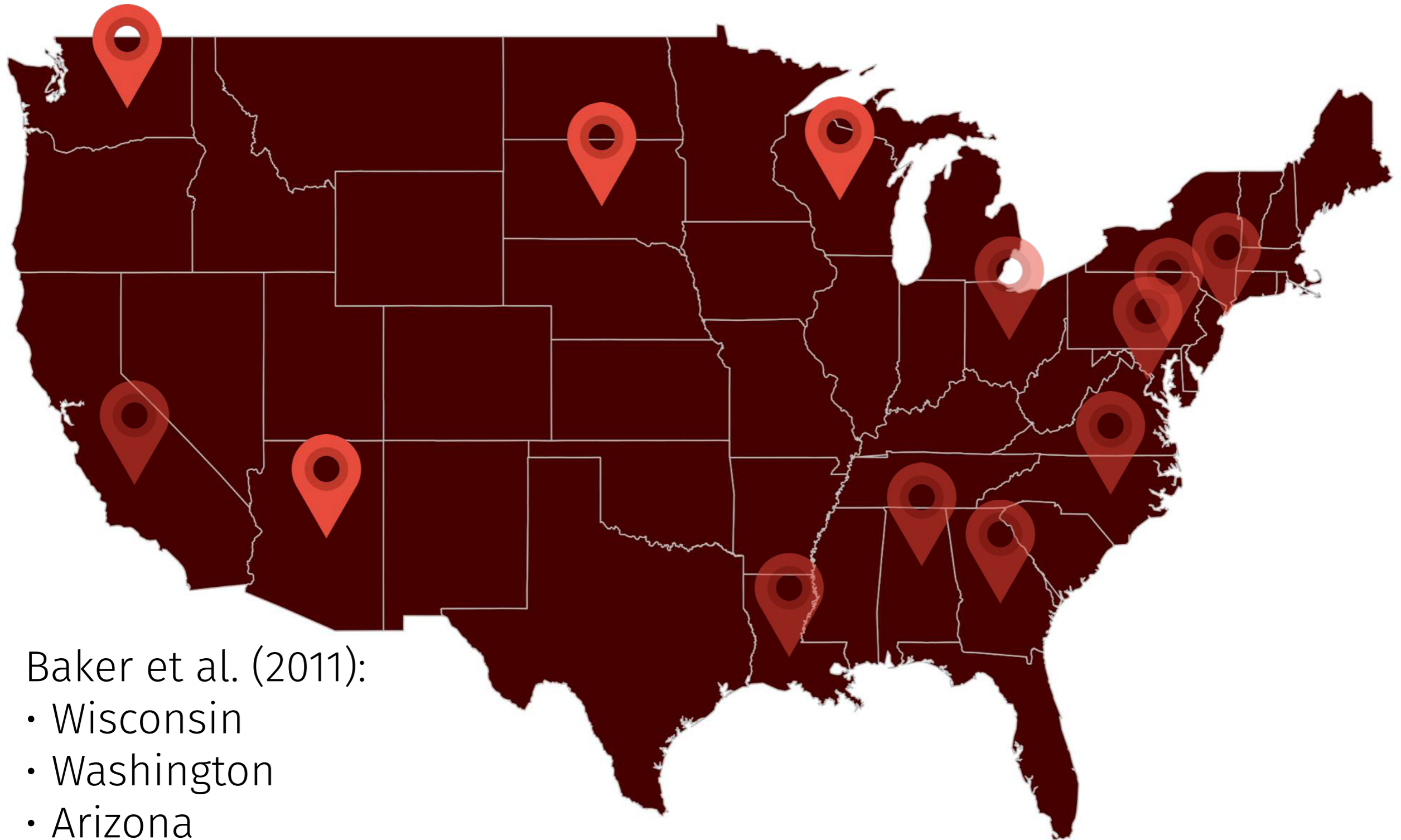
# GEOGRAPHIC SPREAD



Shapiro (1995):

- Queens, NY
- Washington DC
- California
- Birmingham, AL

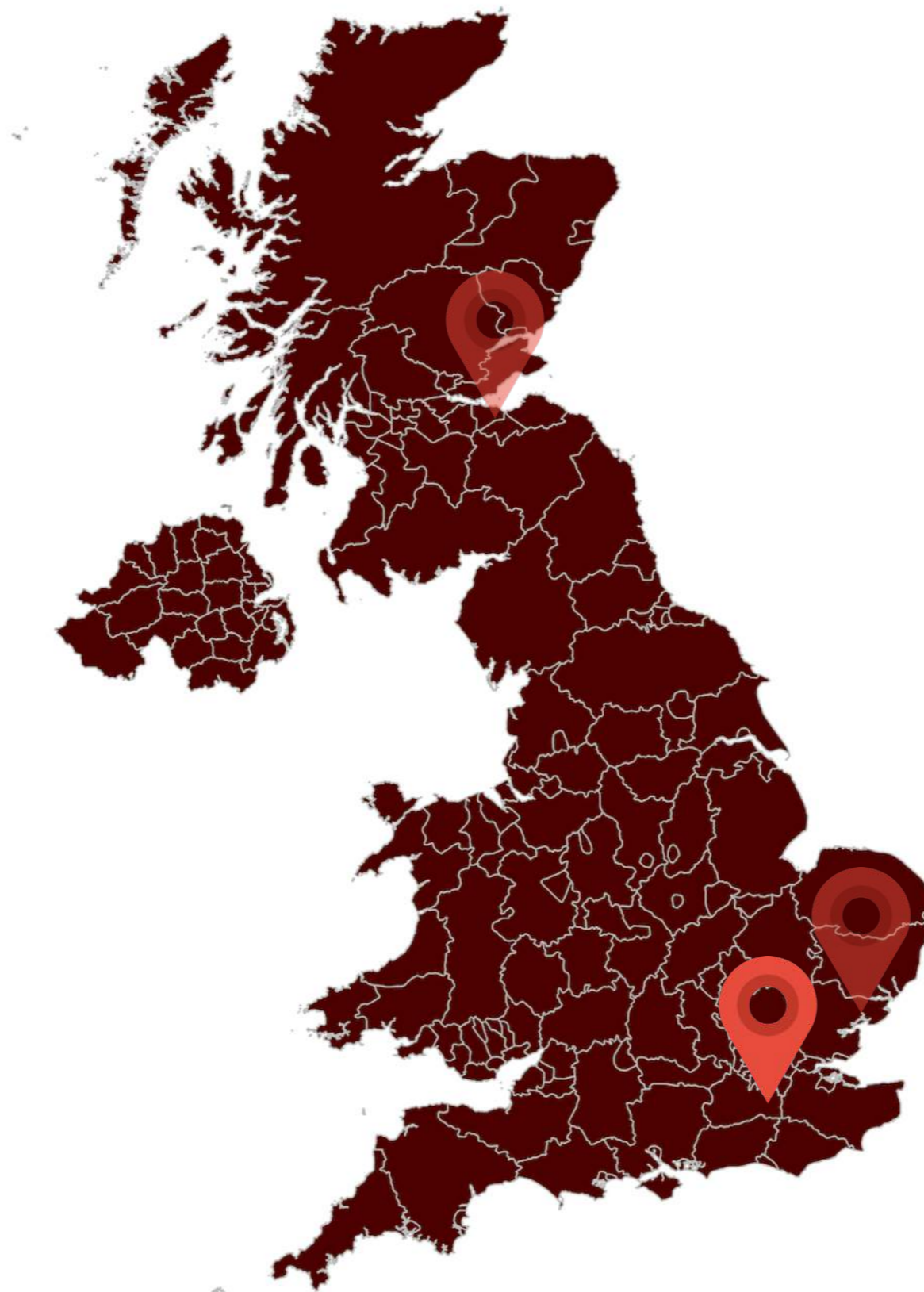
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Baker et al. (2011):

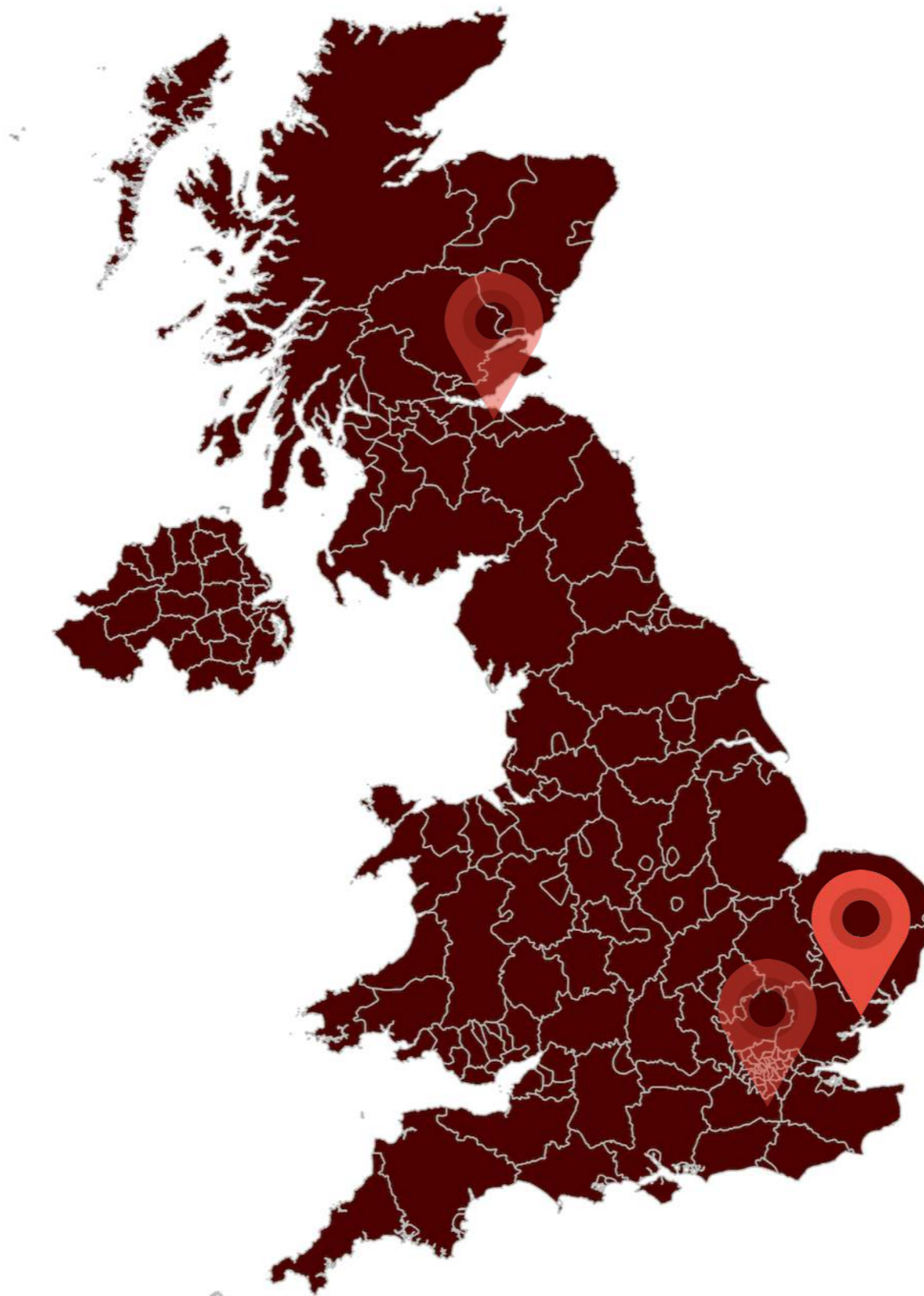
- Wisconsin
- Washington
- Arizona
- South Dakota

# GEOGRAPHIC SPREAD



Altendorf (2003):  
• Estuary English

# GEOGRAPHIC SPREAD



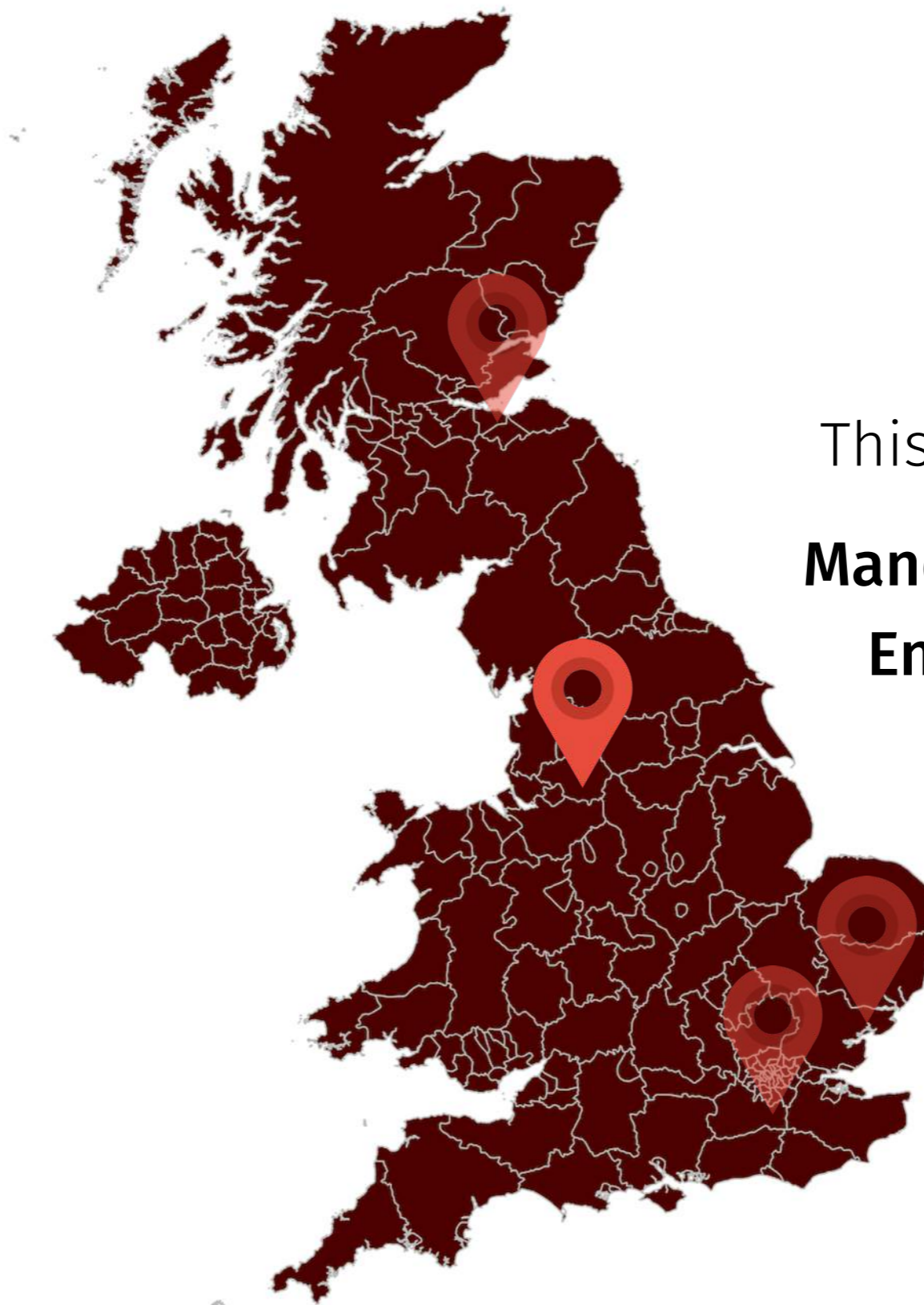
Bass (2009):  
• Colchester

# GEOGRAPHIC SPREAD



Sollgan (2013):  
• Edinburgh

# GEOGRAPHIC SPREAD



This study:  
**Manchester  
English**

# PHONETIC MOTIVATIONS

Two competing accounts:

/ s t ɹ i: t /

- /s/ retracts far less in /st/ clusters, e.g. *steep* (Shapiro 1995)

Coarticulatory bias towards retraction in other /sCɹ/ clusters (Baker et al. 2011)

- Inter-speaker variation in the extent of this phonetic bias  
“suggests a solution to the actuation problem” (Baker et al. 2011)

/ s tʃ ɹ i: t /

- /t/ is always affricated when /s/ is retracted in /stɹ/ (Lawrence 2000)
- Pre-ɹ affrication of /t/ is widespread in varieties of English (Cruttenden 2014:189-92)



# PHONETIC MOTIVATIONS

Two competing accounts:



**“It may prove difficult to tease apart the effects of contact with affricated /t/ and variably-articulated /ɹ/[...] and isolate a single underlying cause...”**

Wilbanks (2017: 302)

We can gain insight into this unresolved issue by looking at British English:

- ▶ **/stj/** - e.g. *stupid*, *student* - affrication but no rhotic

Which of the two competing accounts finds the most empirical support in BrE?

# **METHODOLOGY**

# DATA COLLECTION

- Sociolinguistic interviews with 131 speakers born and raised in Greater Manchester
  - ESRC funded project on Manchester English – interviews conducted by local fieldworkers and students
- **Birth years** spanning almost a century, from 1907 to 2001
- **Socioeconomic status** determined based on **occupation** (3 levels: working class, middle class, upper middle class) and **education** (see Baranowski & Turton 2018)
- ~85,000 tokens of sibilants across all environments, measured using Centre of Gravity (Jongman et al. 2000)

# DATA PROCESSING AND ANALYSIS

## Cleaning:

- ▶ Downsampled to 22kHz
- ▶ High-pass filtered at 750Hz
- ▶ Removed tokens where spectral peak or CoG < 2400Hz
- ▶ Removed outliers (1.5\*IQR)

## Analysis:

- ▶ Mixed-effects linear regression using `lme4` (Bates et al. 2011)
- ▶ Random intercept of **word** and random by-**speaker** slope of **cluster type**

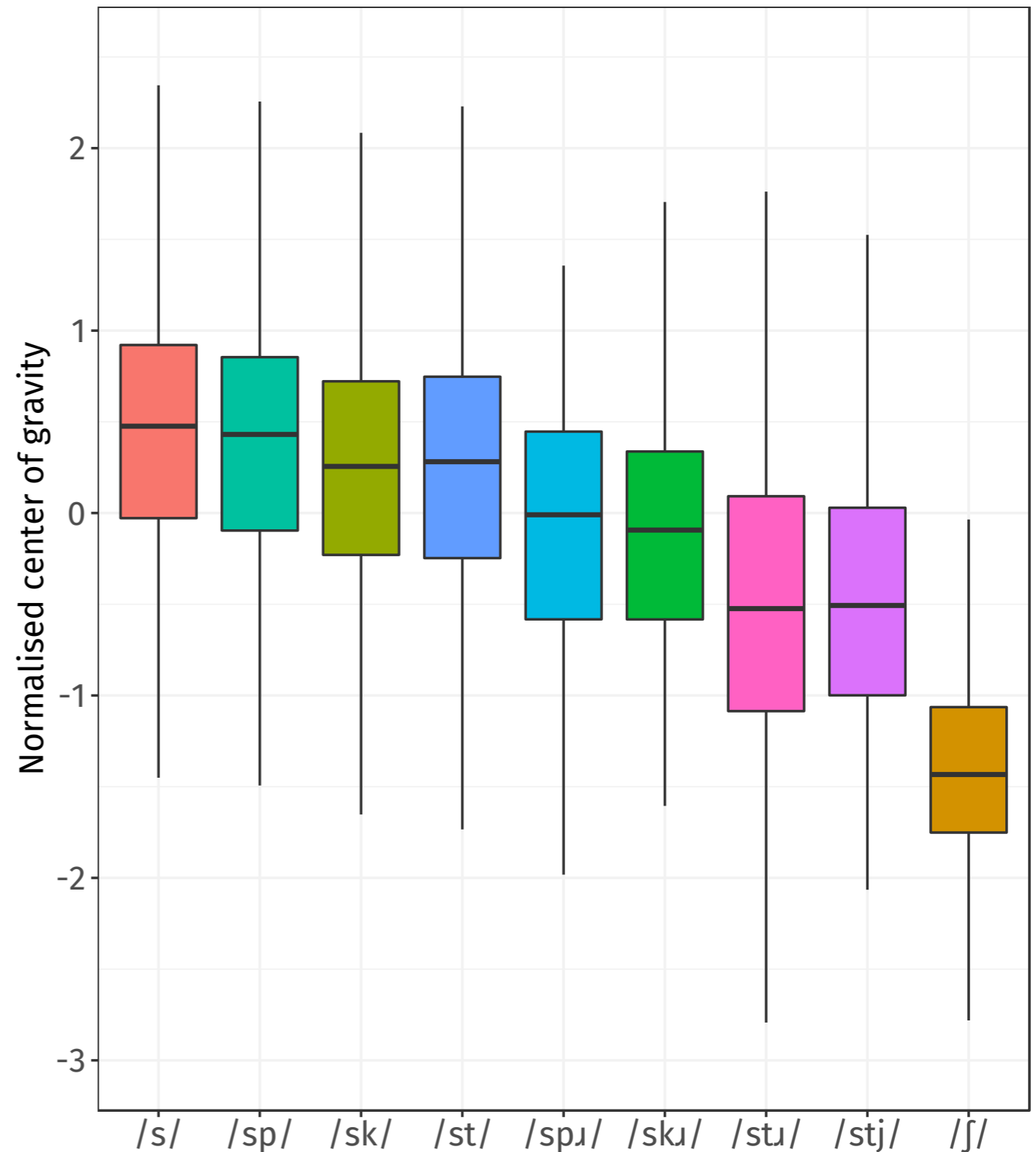
## Processing:

- ▶ Normalised into z-scores
- ▶ **Word frequency** counts taken from SUBTLEX-UK corpus (van Heuven 2014)
- ▶ Extracted **duration** of each sibilant
- ▶ **Position** in word and phrase (initial vs. medial)
- ▶ Extracted **following vowel** (to investigate effect of rounding)

# RESULTS

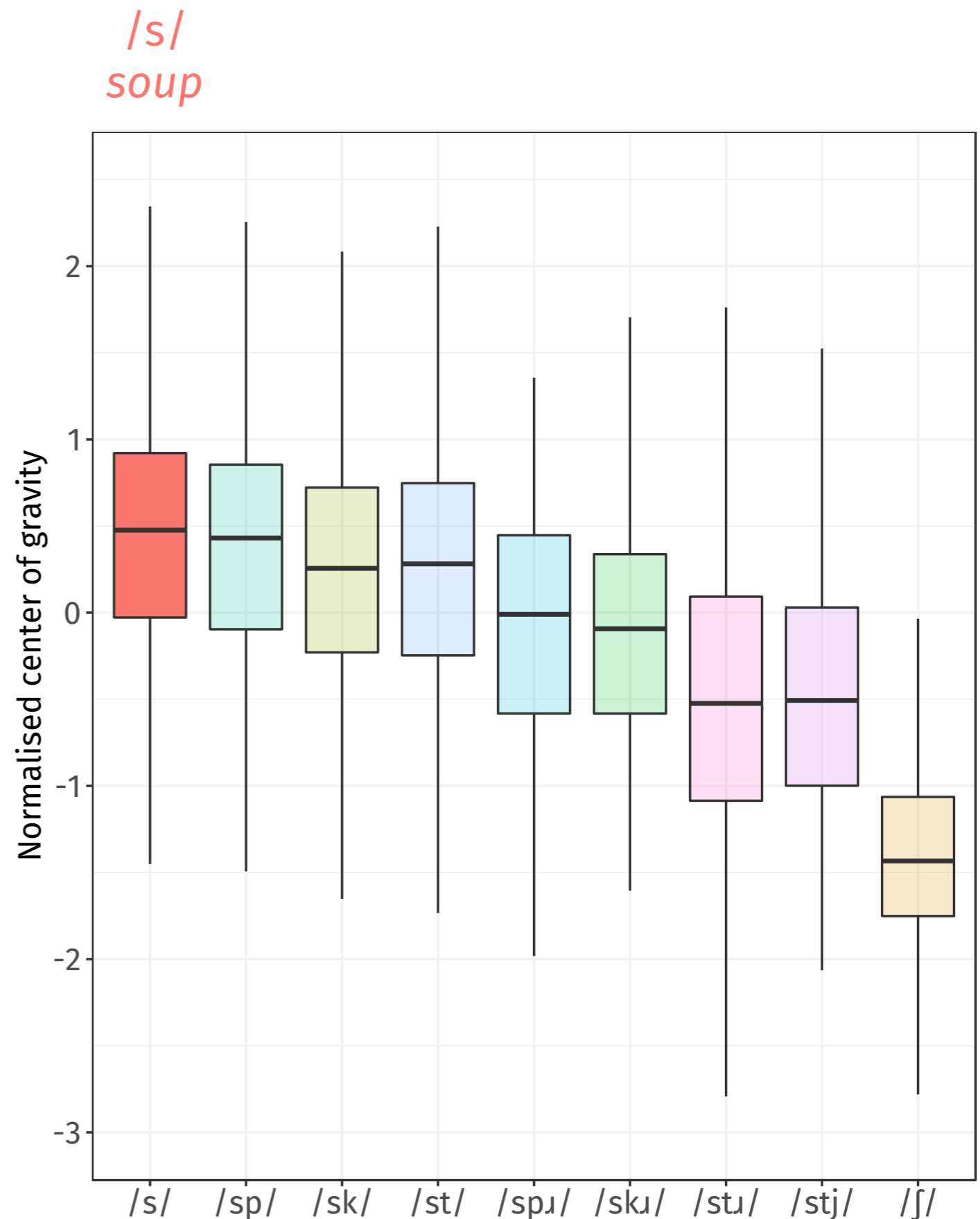
# ALL ONSET TYPES

- Hierarchy of retraction contexts as attested elsewhere (e.g. Baker et al. 2011)
- /ɹ/ causes some **low-level retraction** even in the absence of affrication, e.g. /spɹ/, /skɹ/
- First quantitative evidence of **retraction** in /stj/ - e.g. *student*, *stupid* etc.



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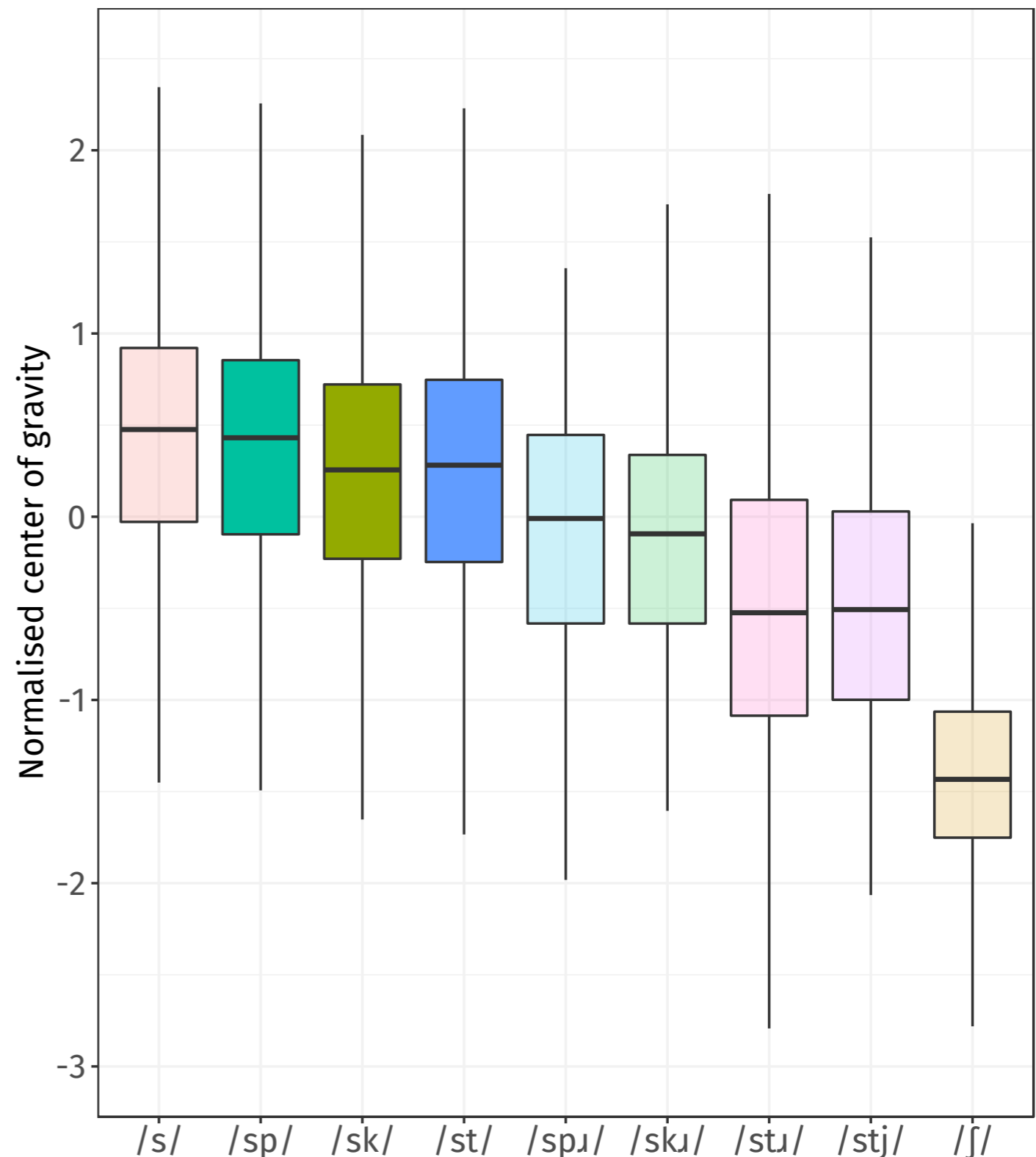
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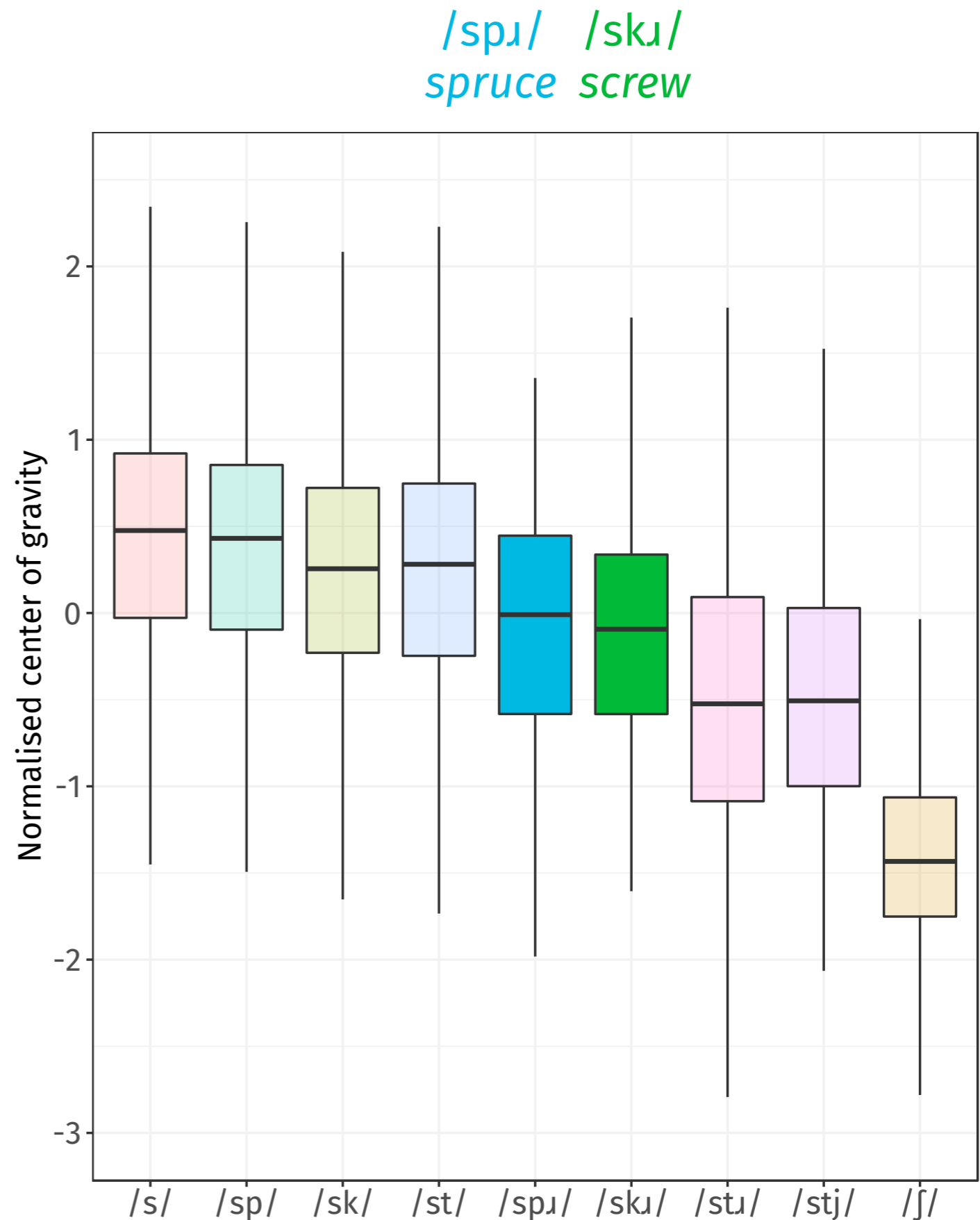
/sp/ /sk/ /st/  
spook school stoop





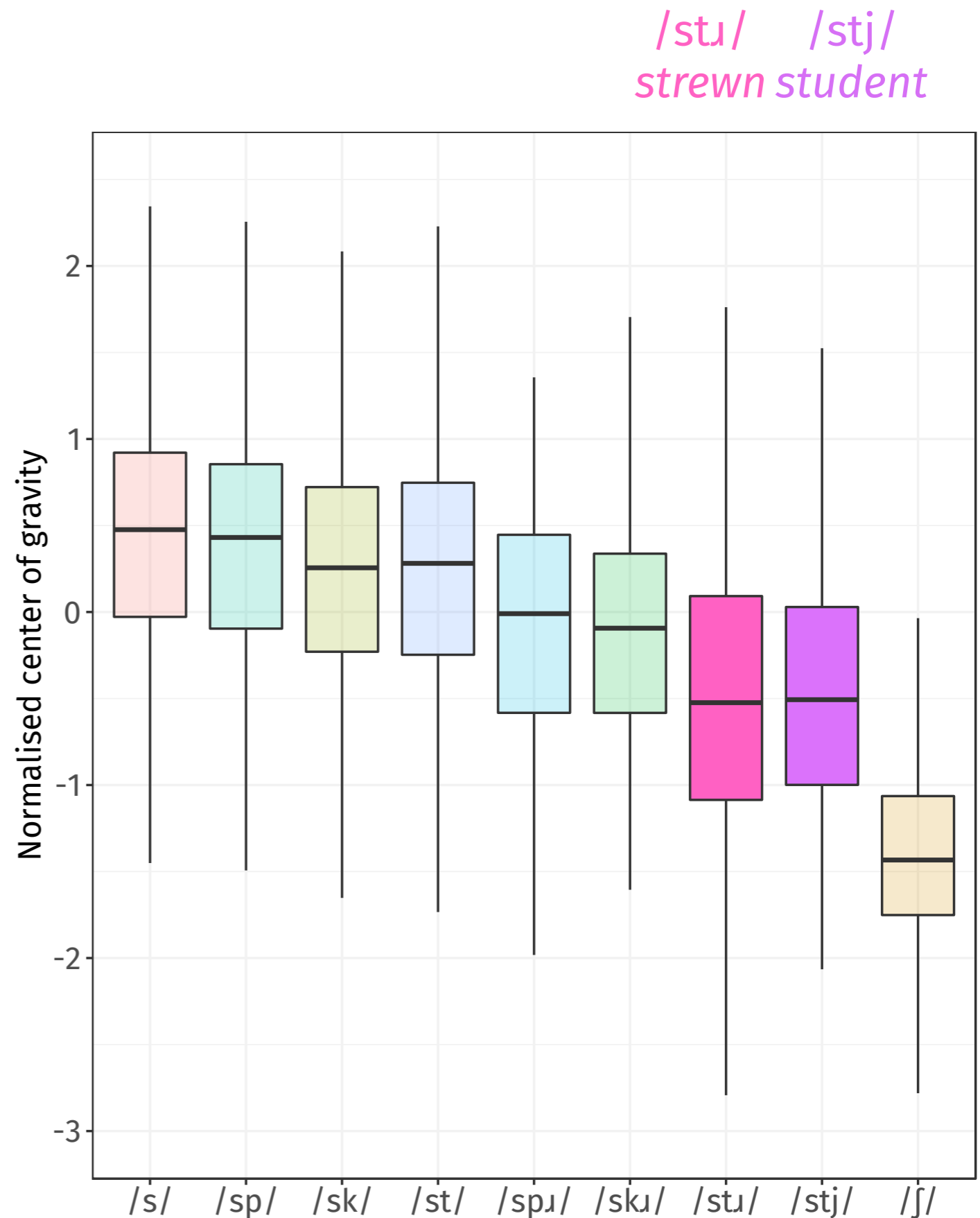
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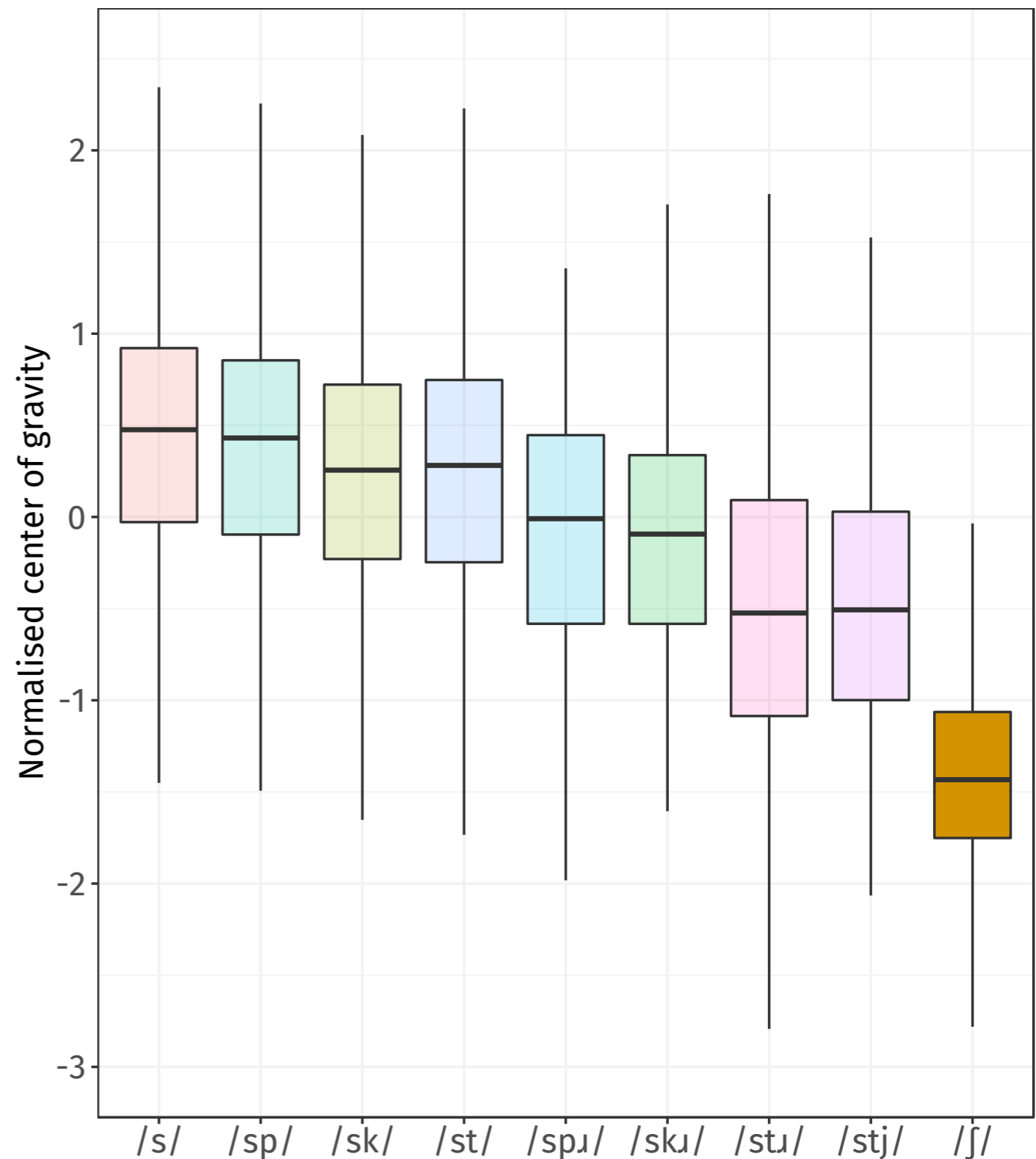
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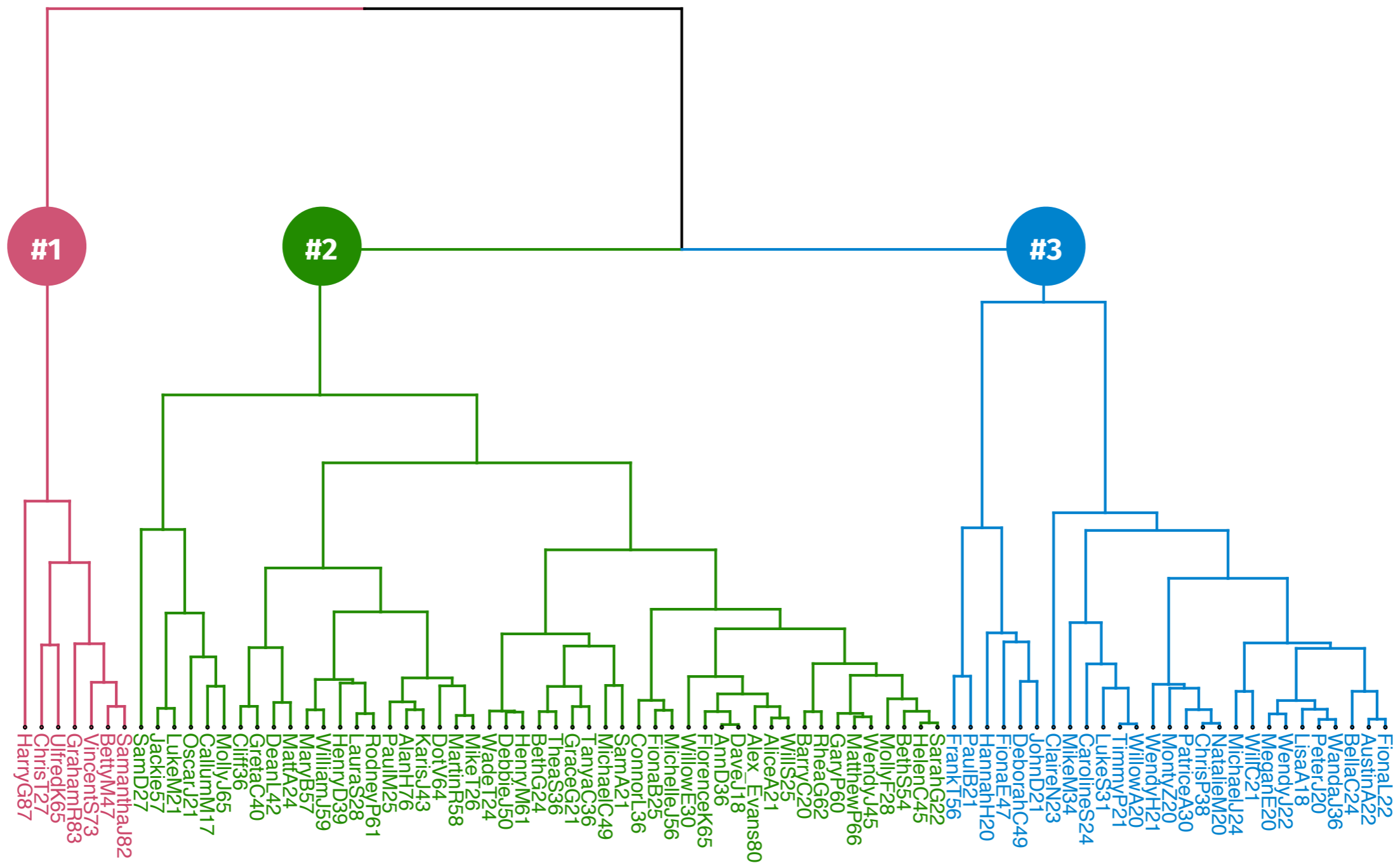
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/ʃ/  
shoe



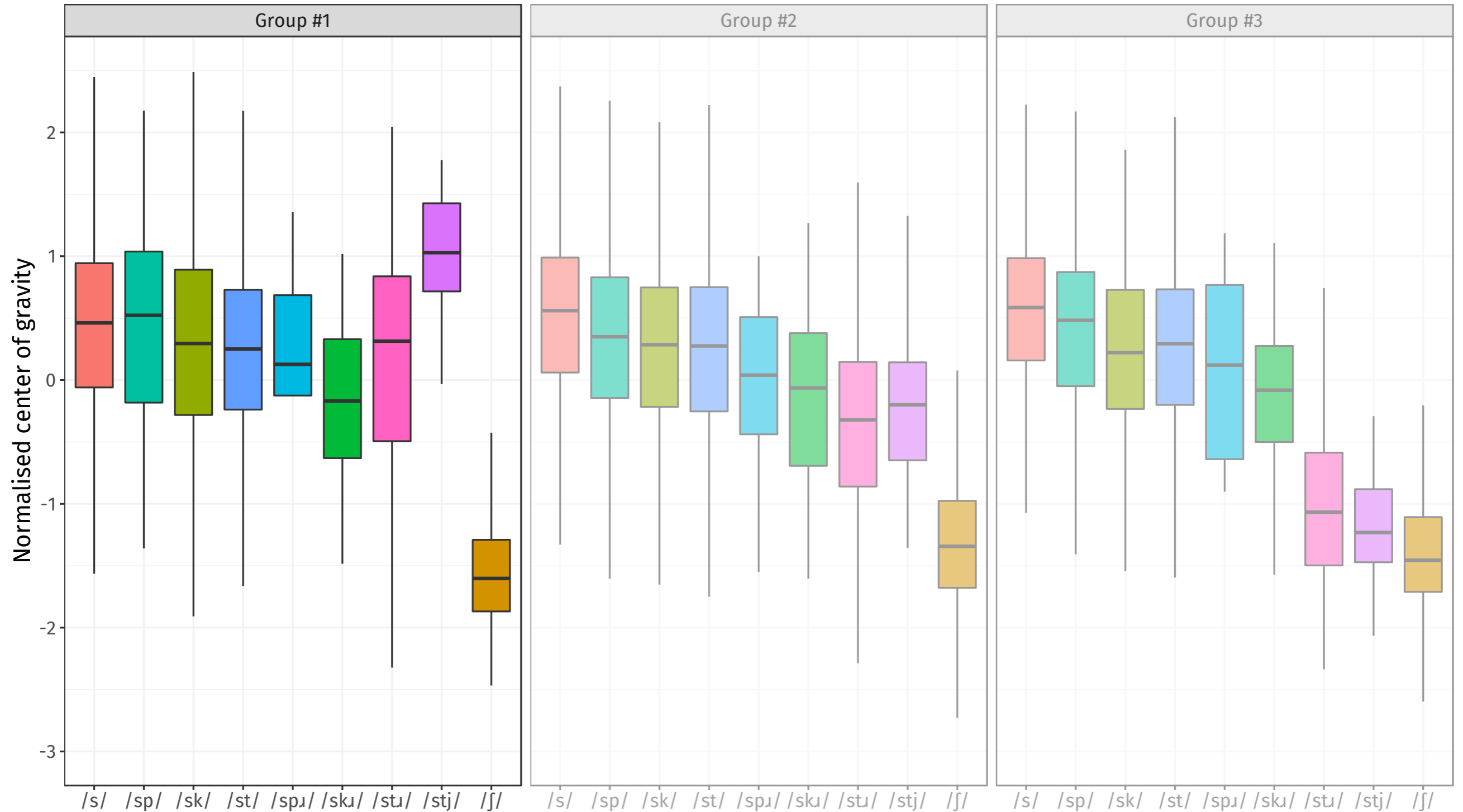
# CLUSTER ANALYSIS

- **Hierarchical cluster analysis** - objectively groups speakers based on distribution of CoG values across environments



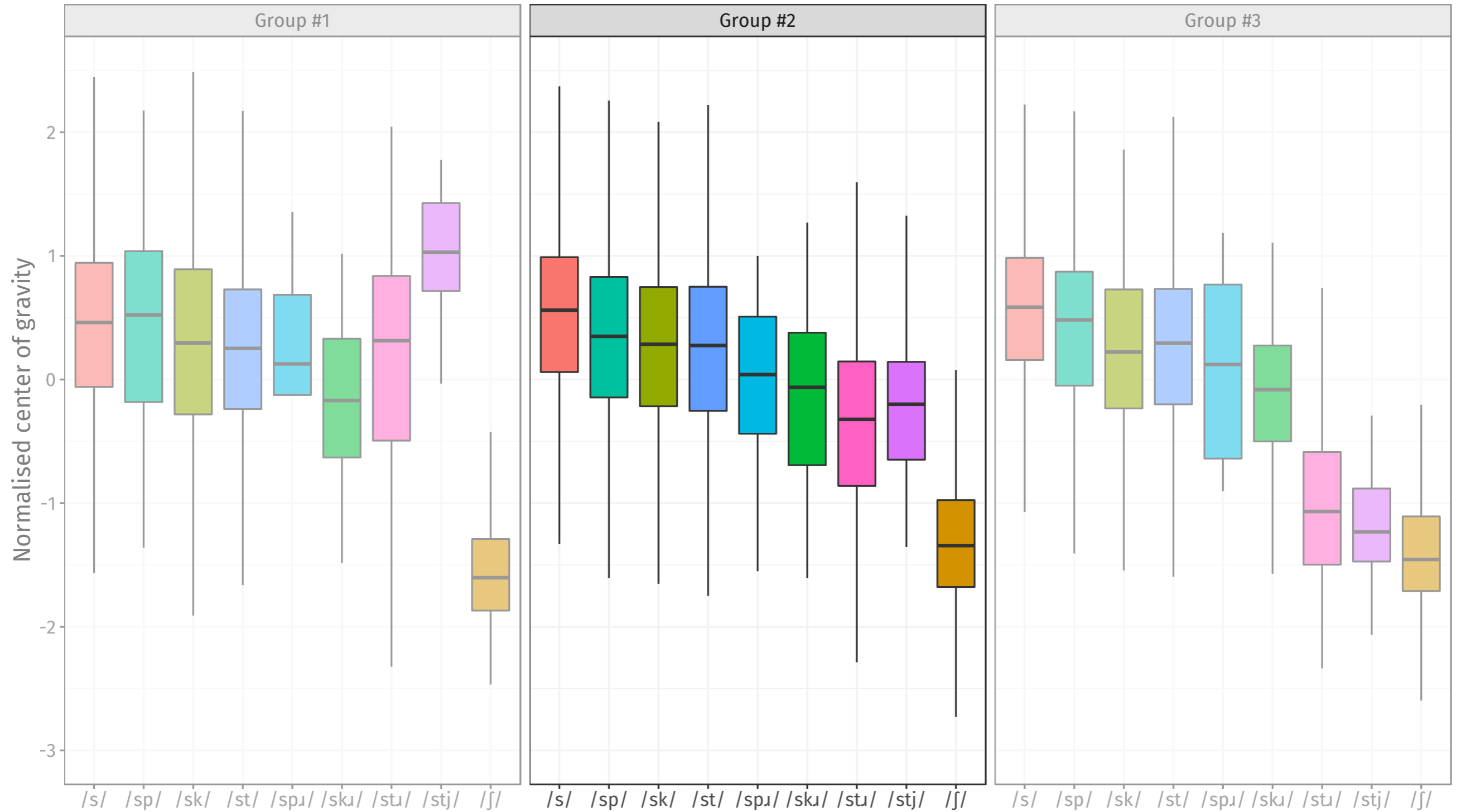
# CLUSTER ANALYSIS

## Group #1 - no pattern of retraction



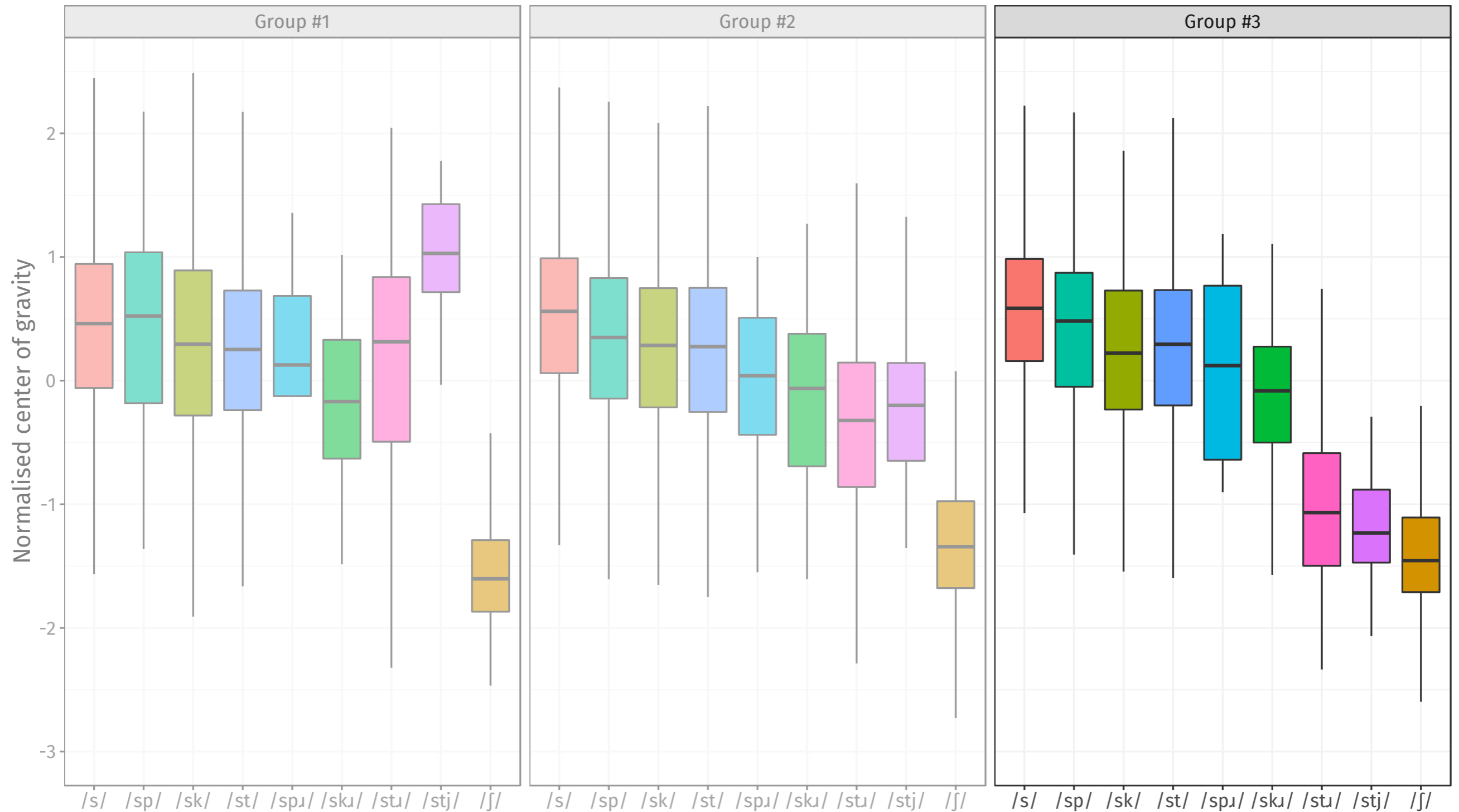
# CLUSTER ANALYSIS

## Group #2 - emerging pattern of retraction



# CLUSTER ANALYSIS

Group #3 - /stu/ and /stj/ approaching /ʃ/



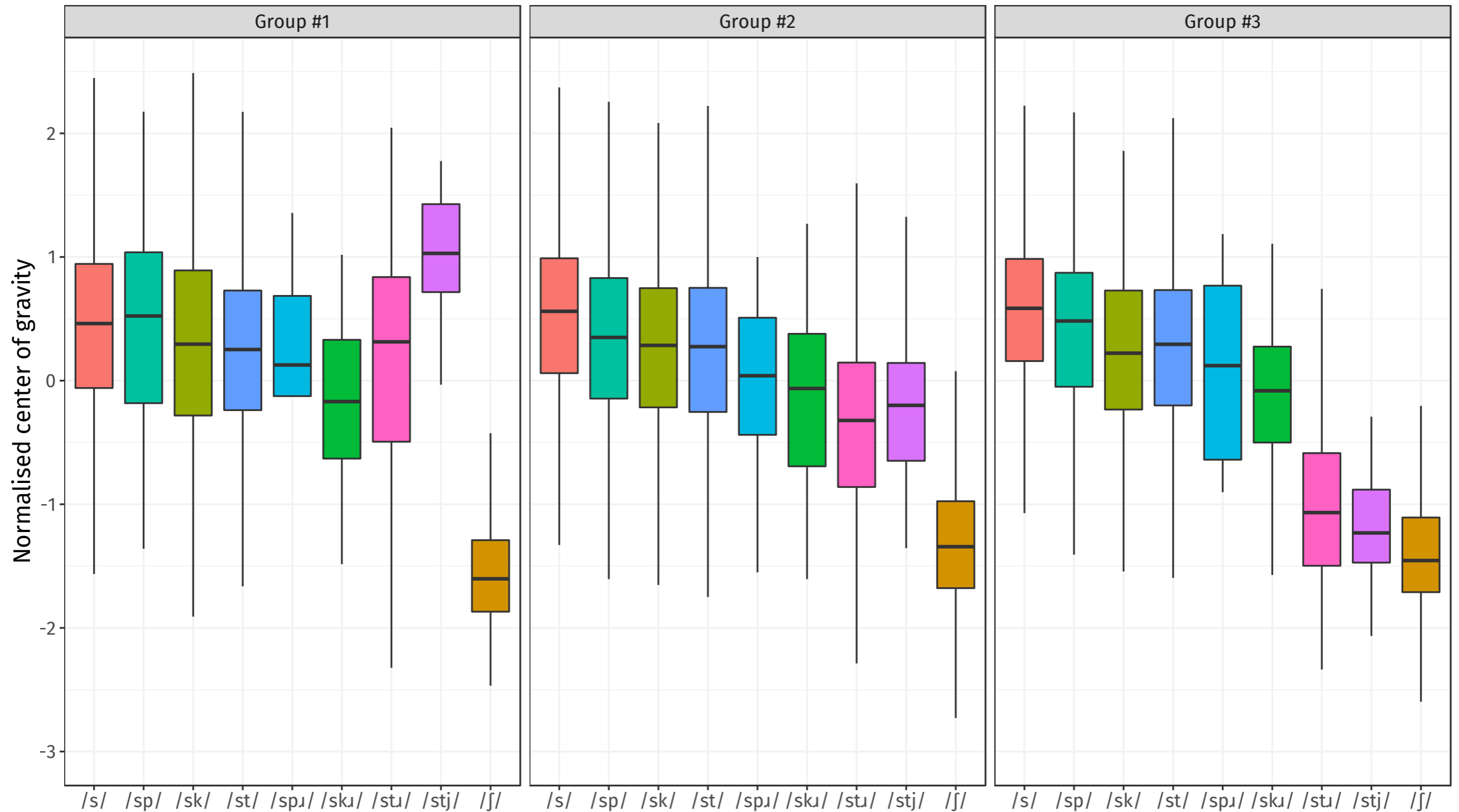
# CLUSTER ANALYSIS

Average date of birth:

1937

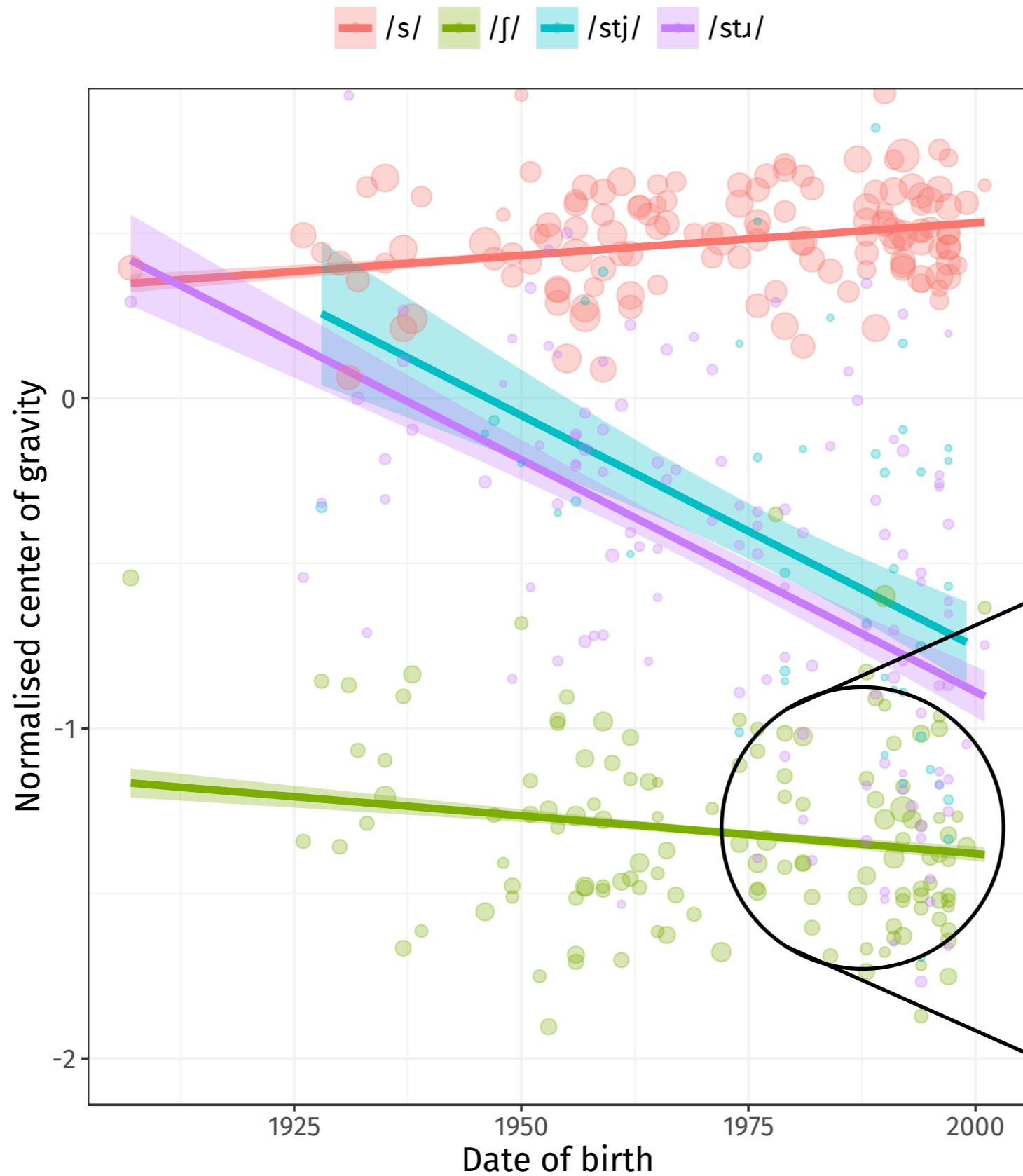
1976

1991

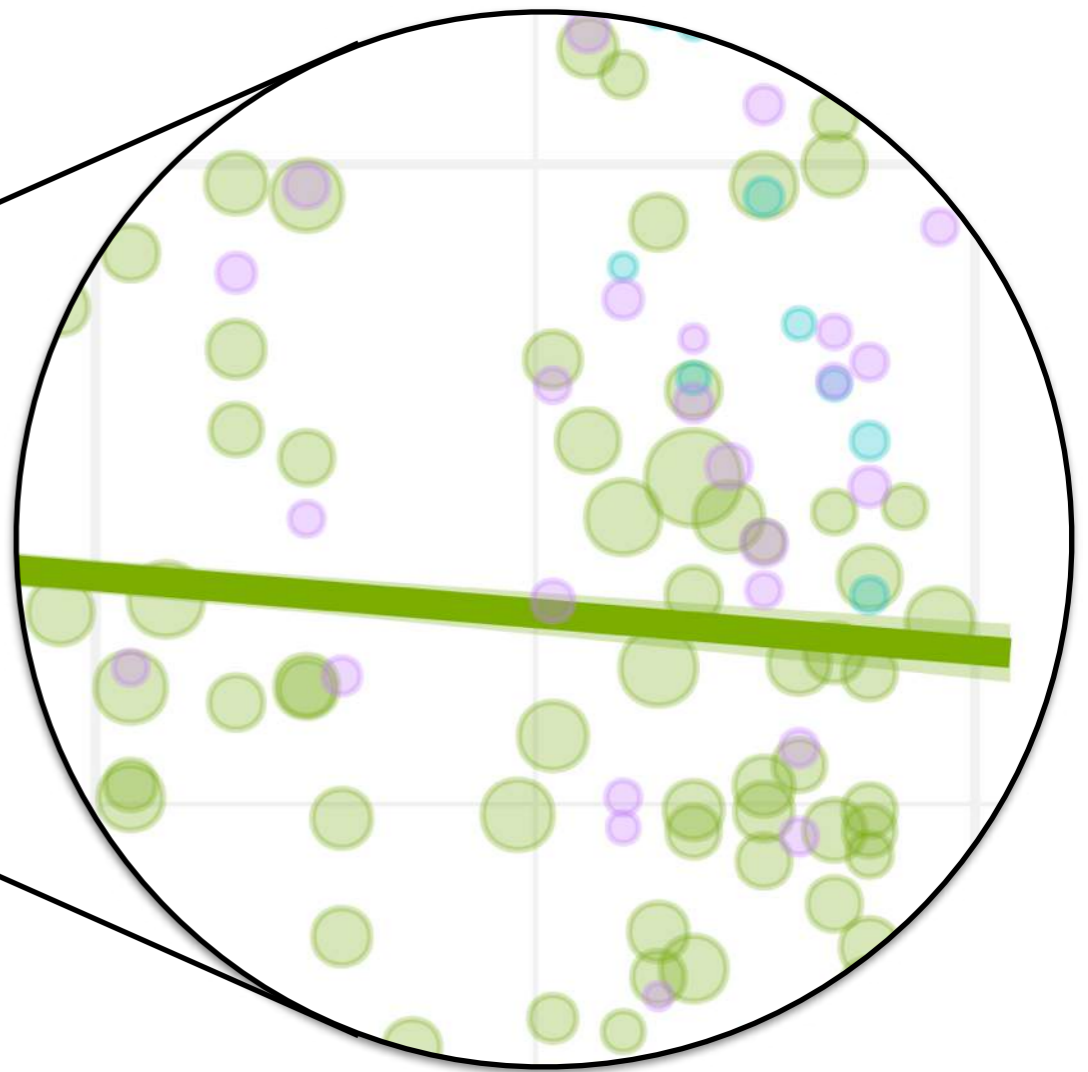




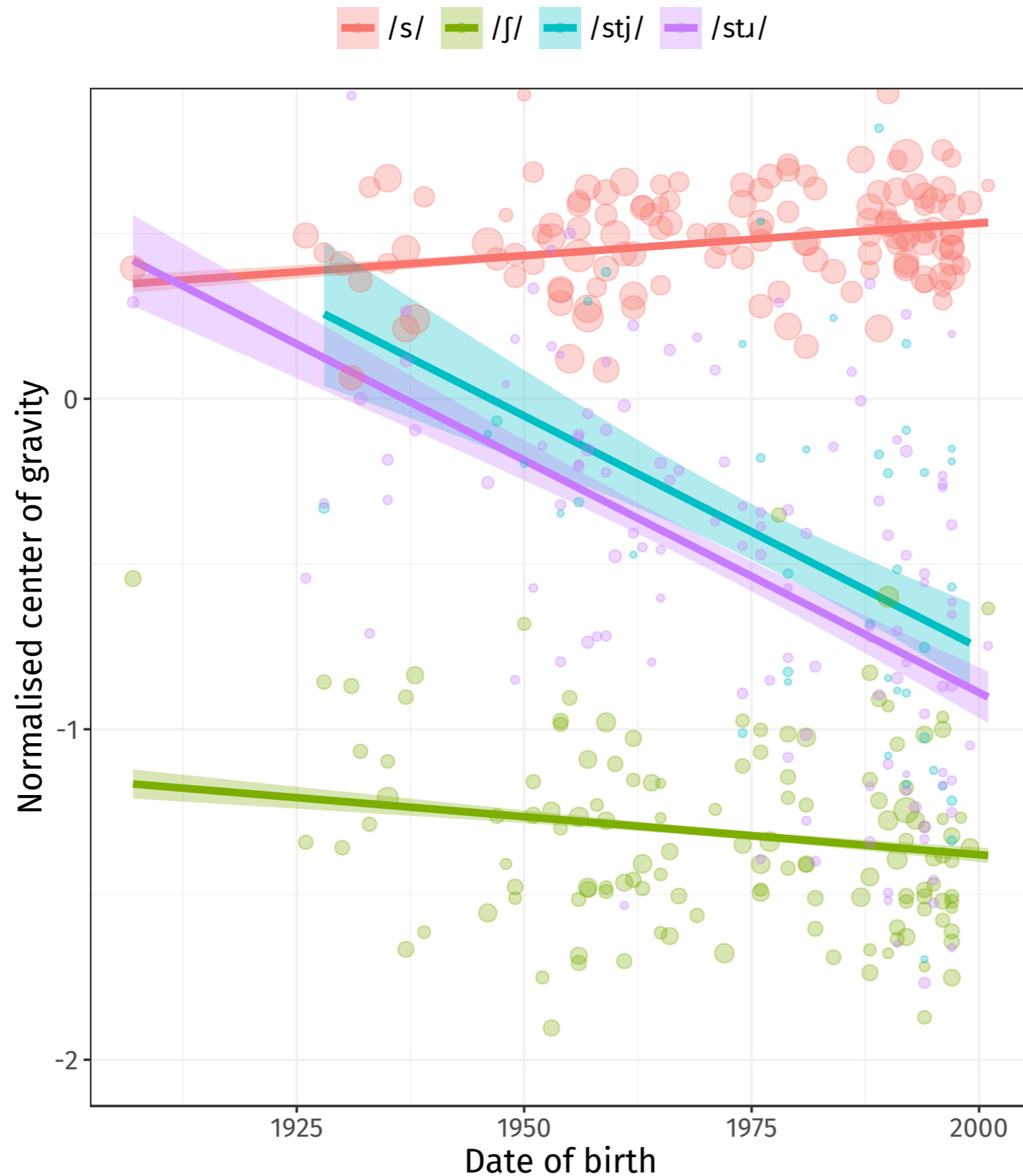
# APPARENT TIME CHANGE #1



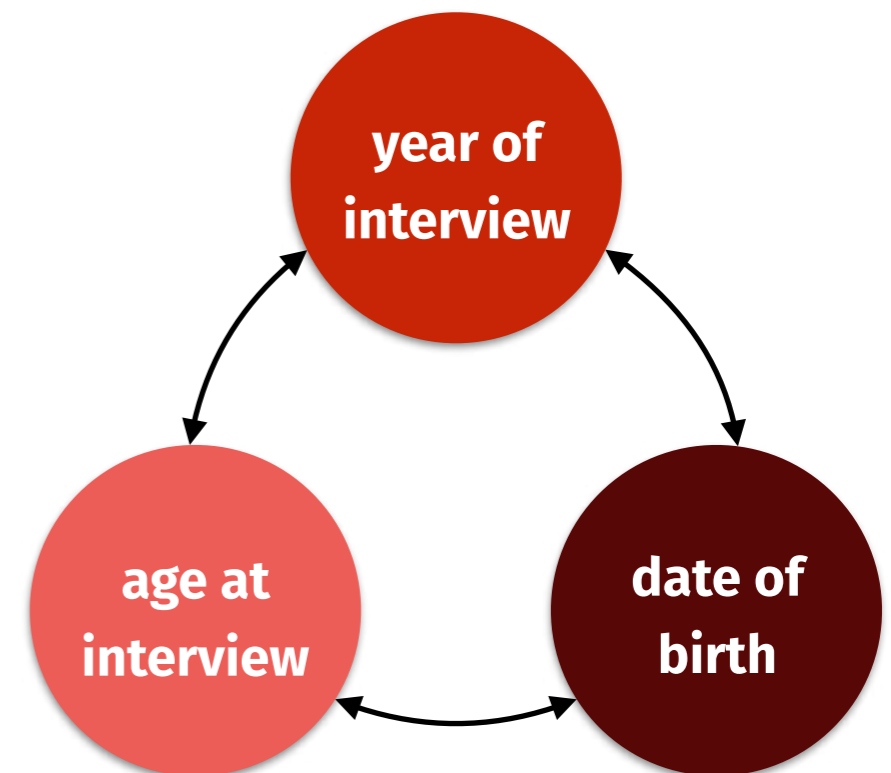
- /stu/ and /stj/ changing in parallel
- Suggests a single underlying cause



# APPARENT TIME CHANGE #2

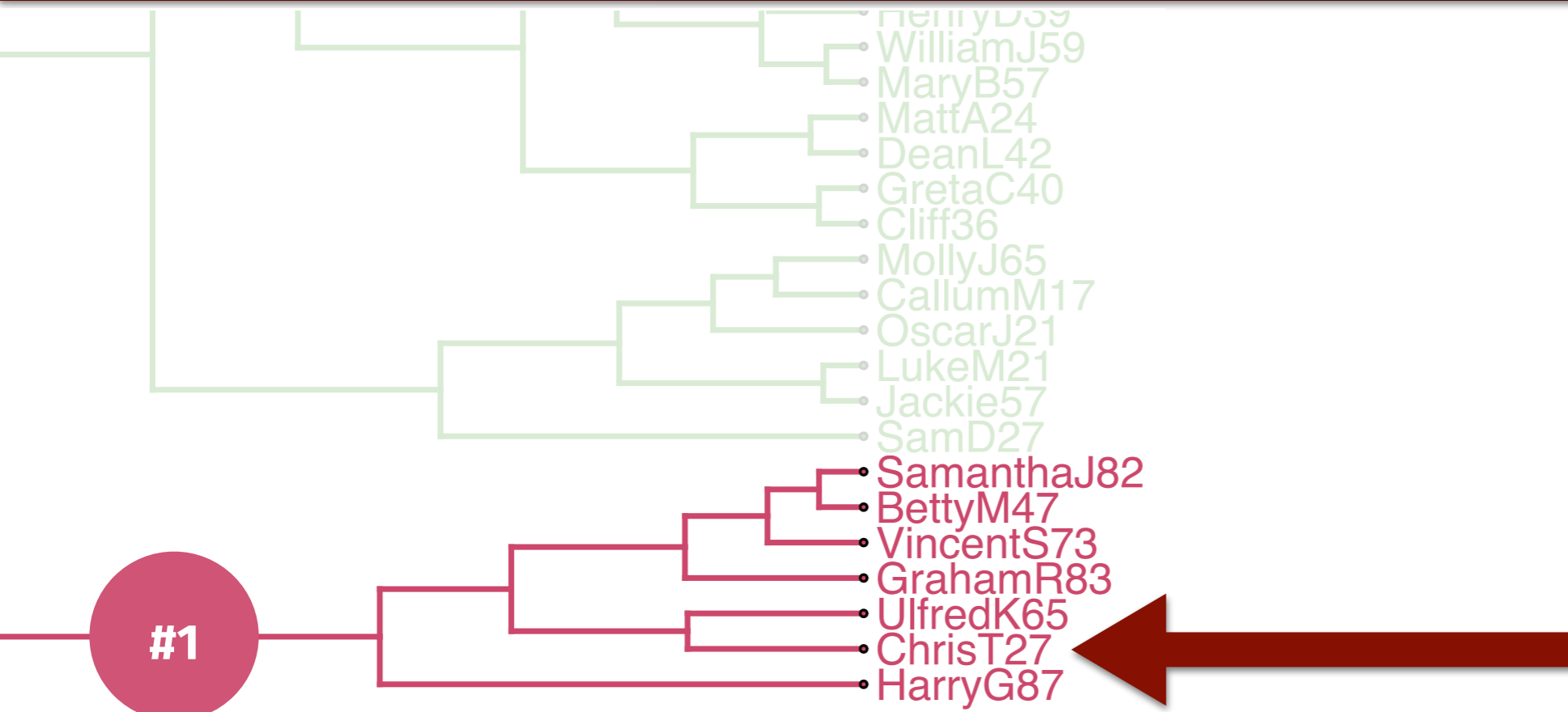


- Pre-vocalic /s/ and /ʃ/ also correlate with date of birth
- Wider fricative space for younger speakers
  - apparent time change?
  - age-graded variation?



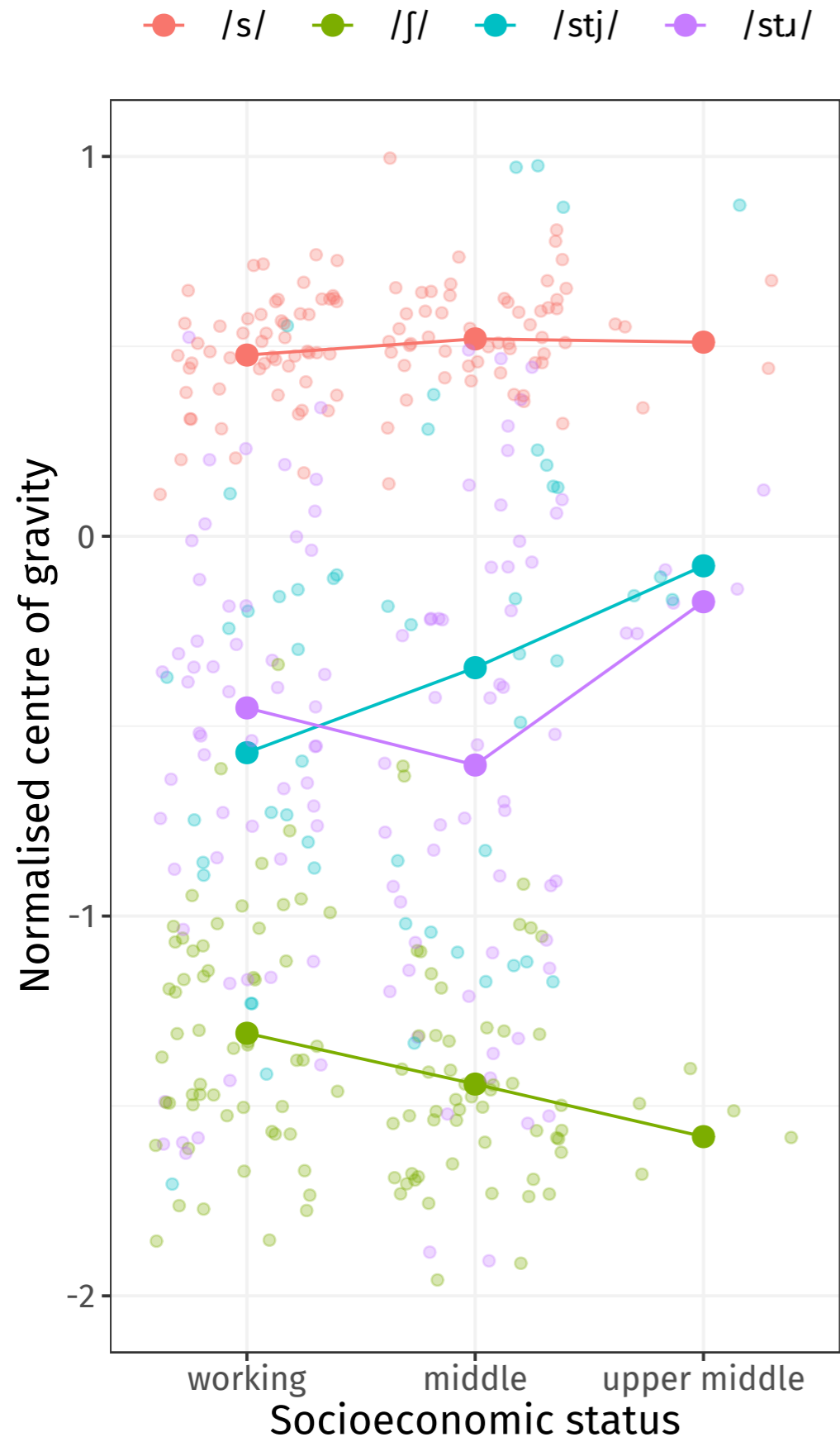
see Fruehwald (2017) - *Generations, lifespans, and the zeitgeist*

# CLUSTER ANALYSIS



What's a 27 year-old doing in group #1?

# SOCIOECONOMIC STATUS



- Based on occupation - found to be best measure of social class in this community (Baranowski & Turton 2018)
  - Suggestion that highest social class is conservative (but  $p = 0.18$ )
- Education tells a similar story, *and* significant difference between highest and lowest group (but lots of missing data)
- Calls for complementary work on indexical meaning of /s/-retraction (see e.g. Phillips & Resnick 2019)

# SOCIAL EVALUATION?

- To what extent are speakers aware of this variation? Is it subject to metalinguistic commentary? If so, how is it evaluated?



my pet peeve is “shtreet” (street). I’ve noticed recently that a lot of speakers are adding these sounds.



People that pronounce it SHtreet. There is no h in the word street.



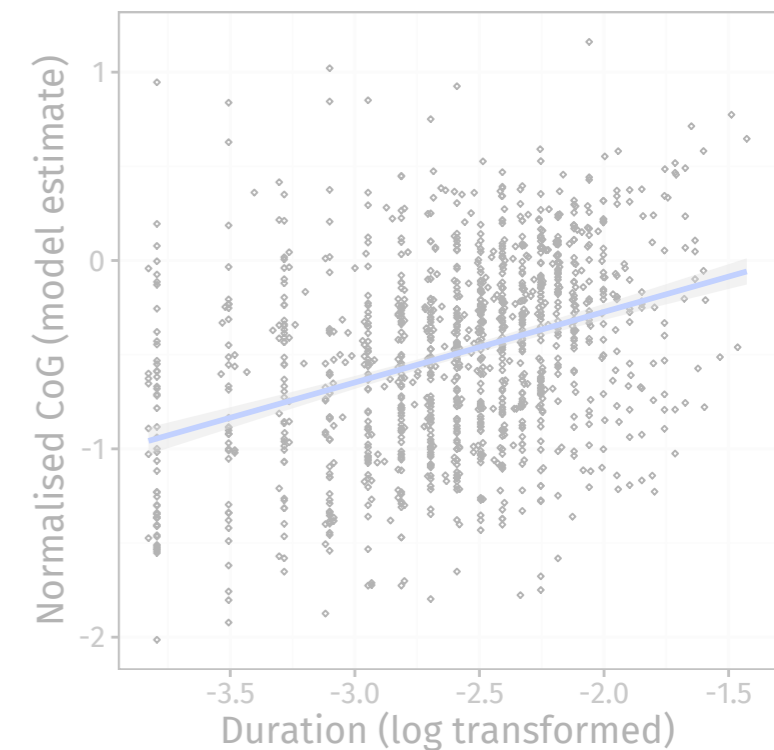
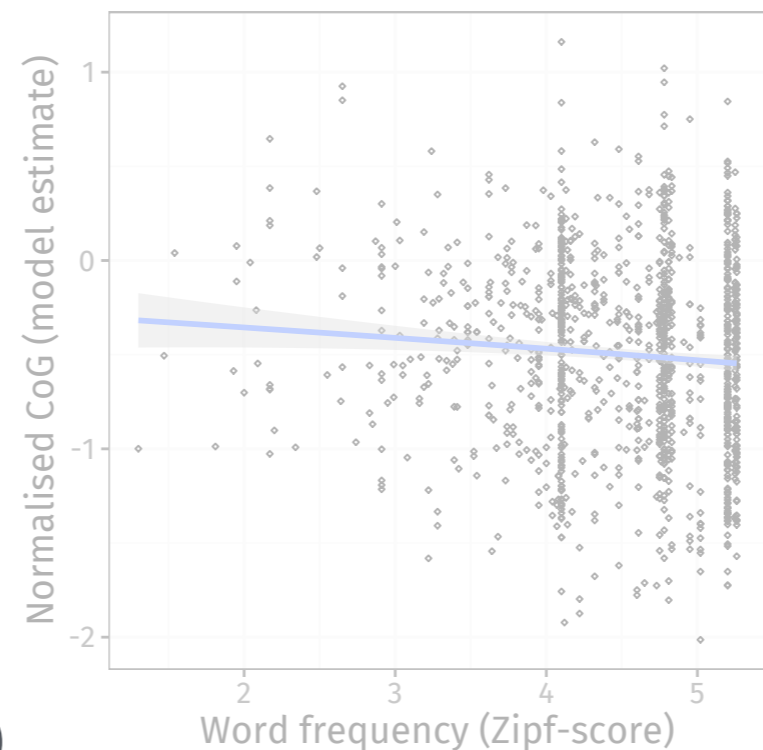
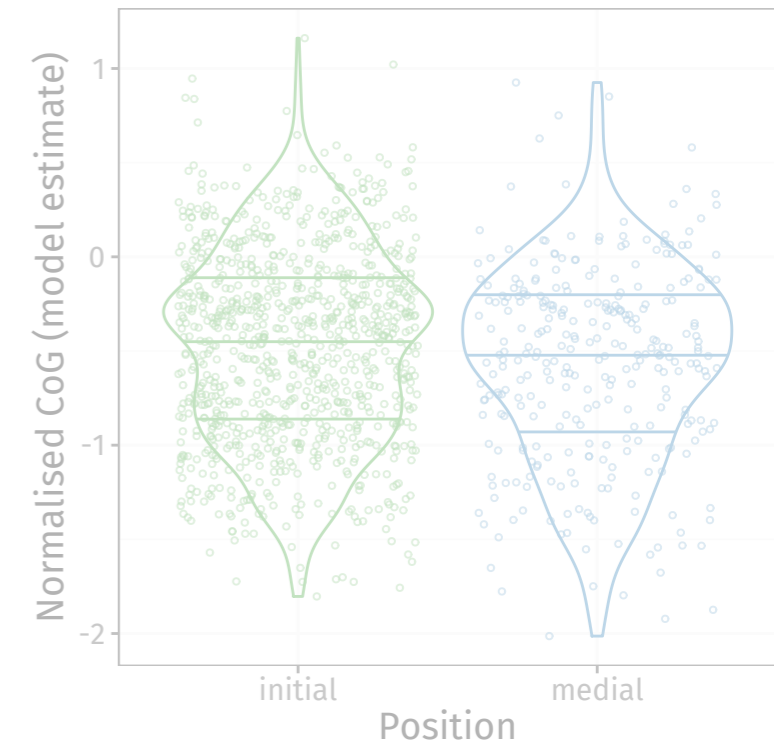
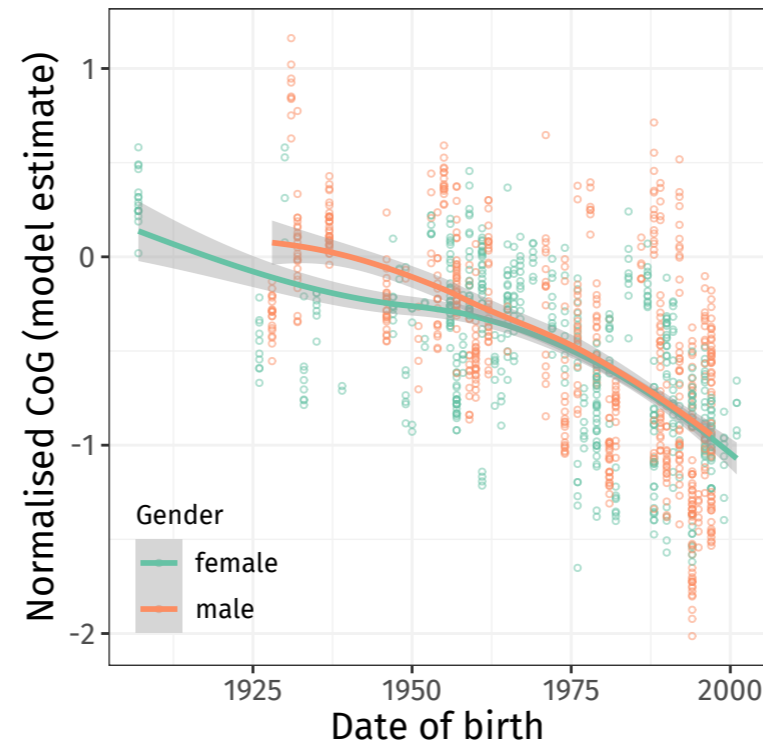
It makes me apoplectic when the “st” sound gets an “h” added to it like: shtreet, or shtrong or shtraight! Those are not proper words people! Even announcers do it! Stop! Just STOP!

# OTHER FACTORS

- Other significant predictors from the model:

- ▶ **gender**: male speakers lagging behind female speakers ( $\beta = 0.233$ ,  $p = 0.01$ )
- ▶ **position**: retraction more advanced in word-medial position ( $\beta = -0.169$ ,  $p = 0.002$ )
- ▶ **frequency**: higher frequency words leading ( $\beta = -0.068$ ,  $p = 0.028$ )
- ▶ **duration**: longer sibilants less retracted ( $\beta = 0.121$ ,  $p < 0.001$ )

(not sig: social class, vowel, cluster type)

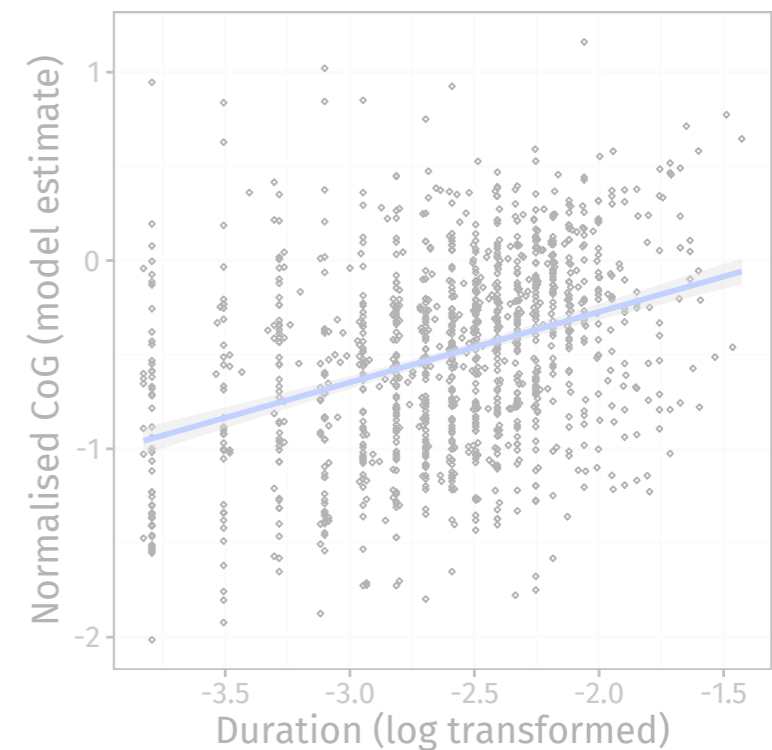
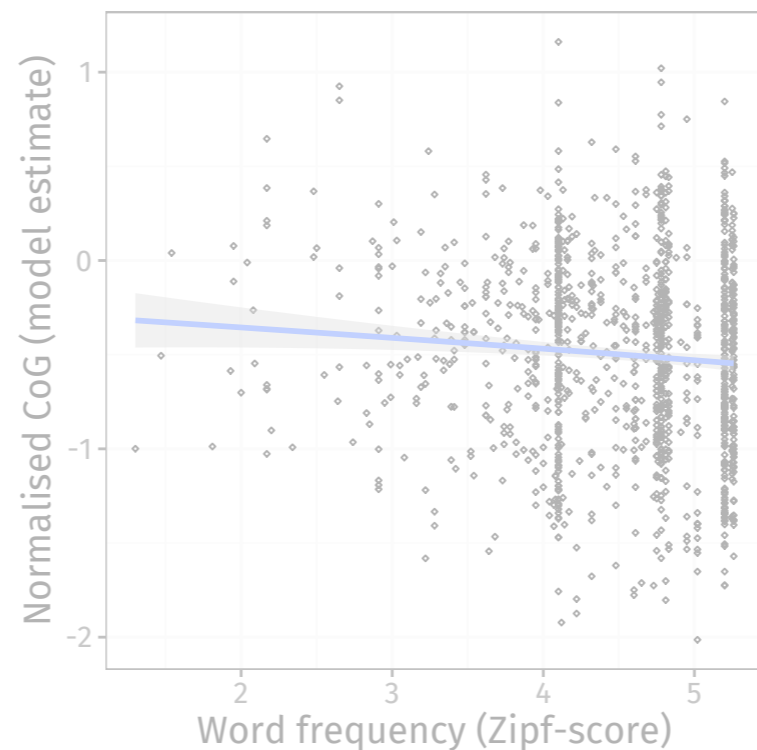
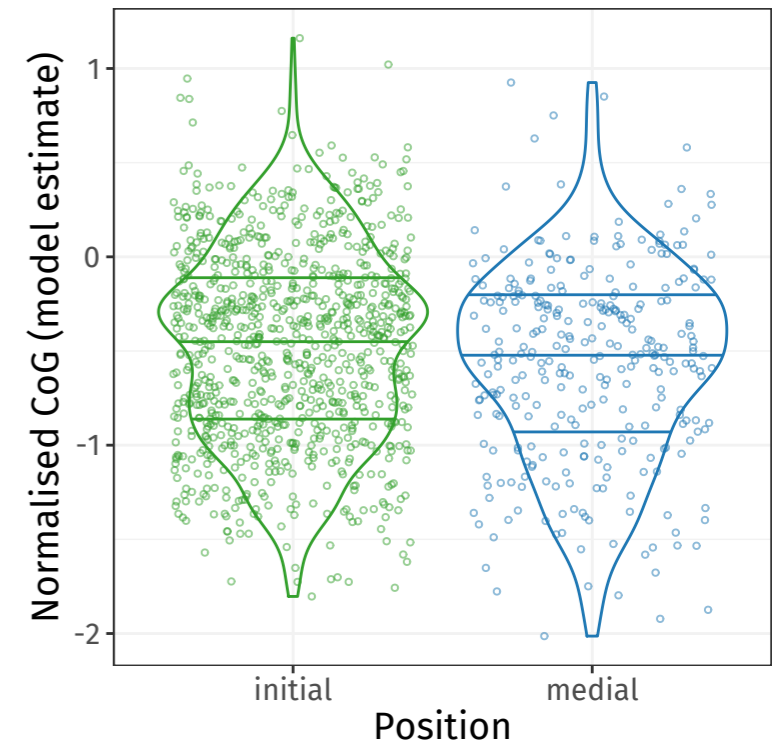
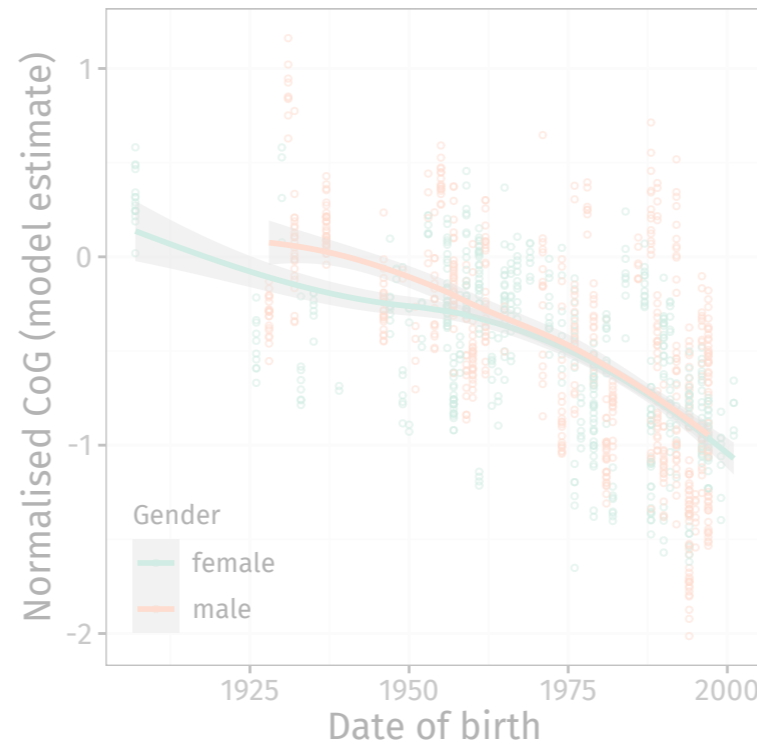


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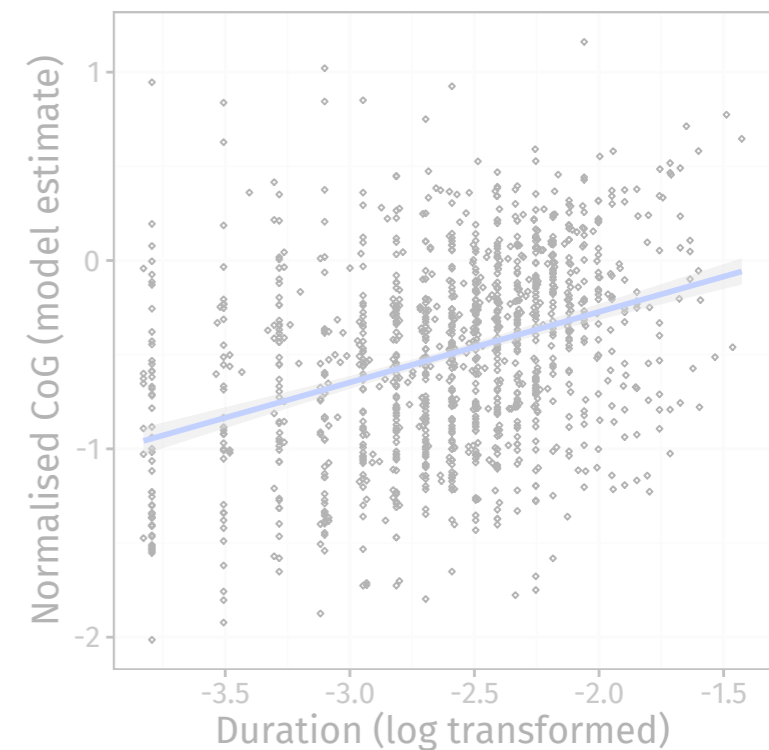
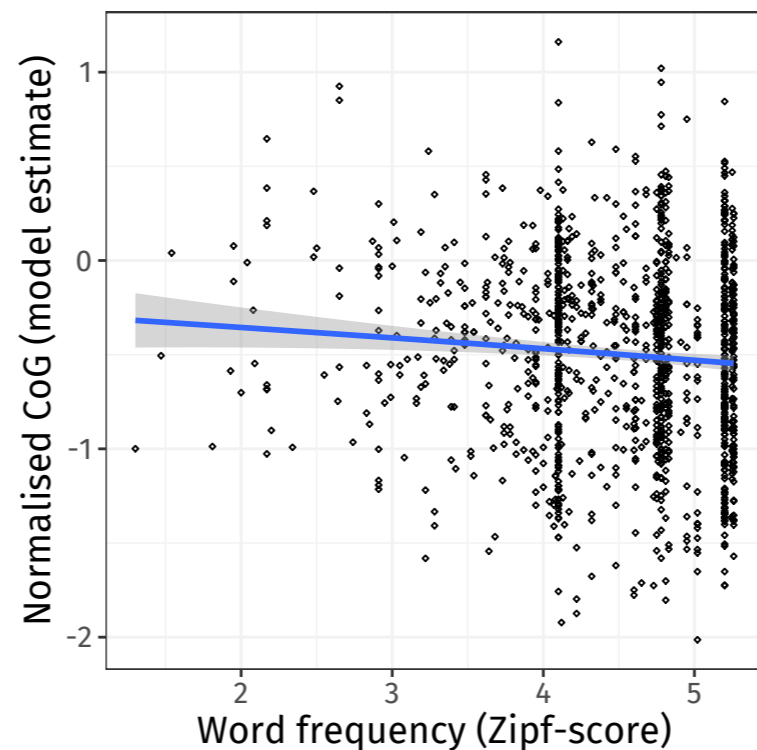
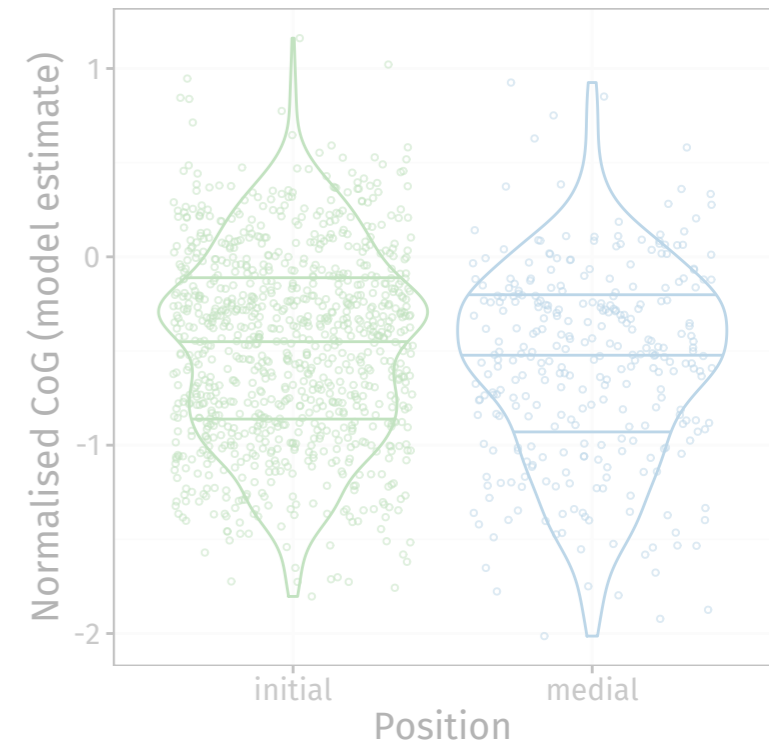
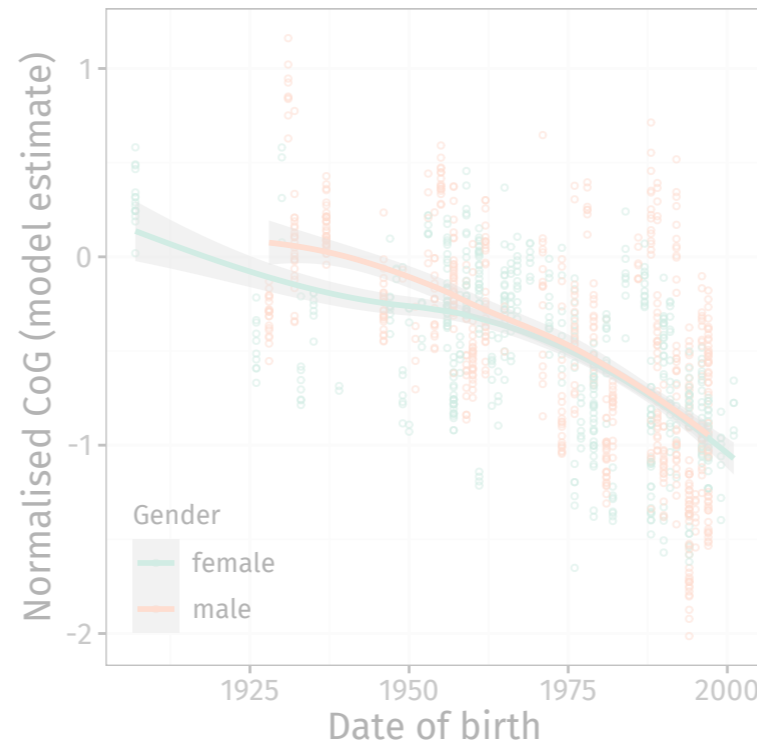


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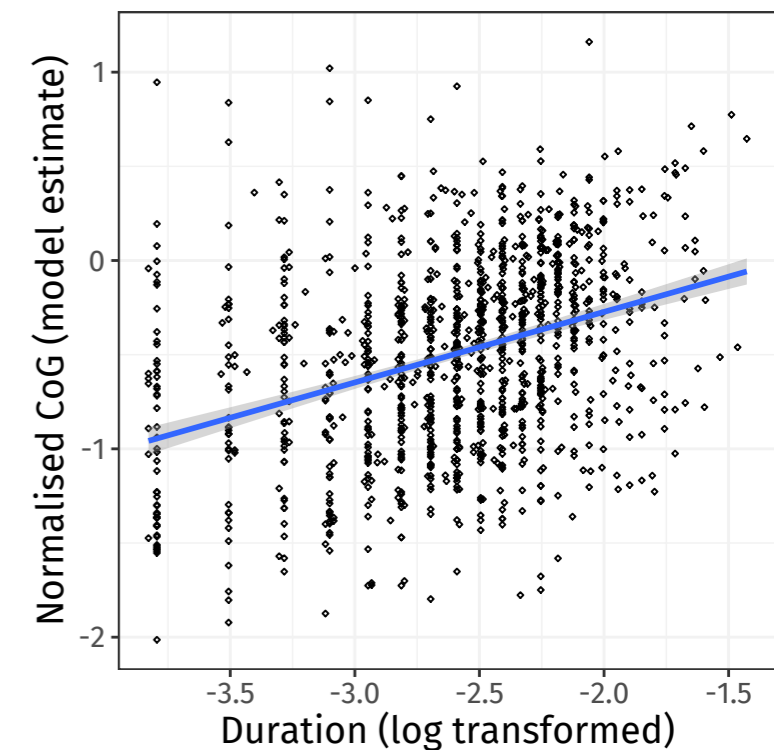
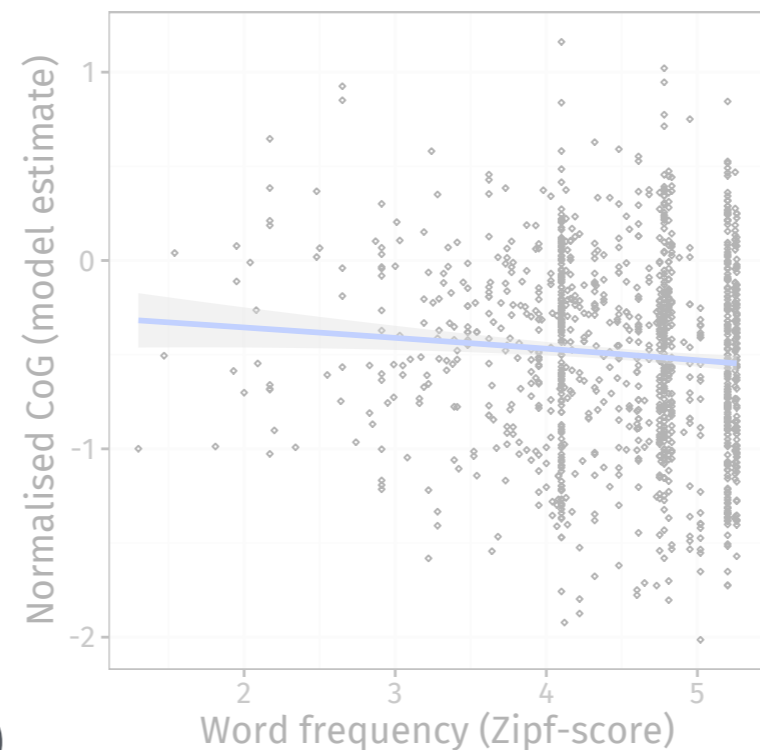
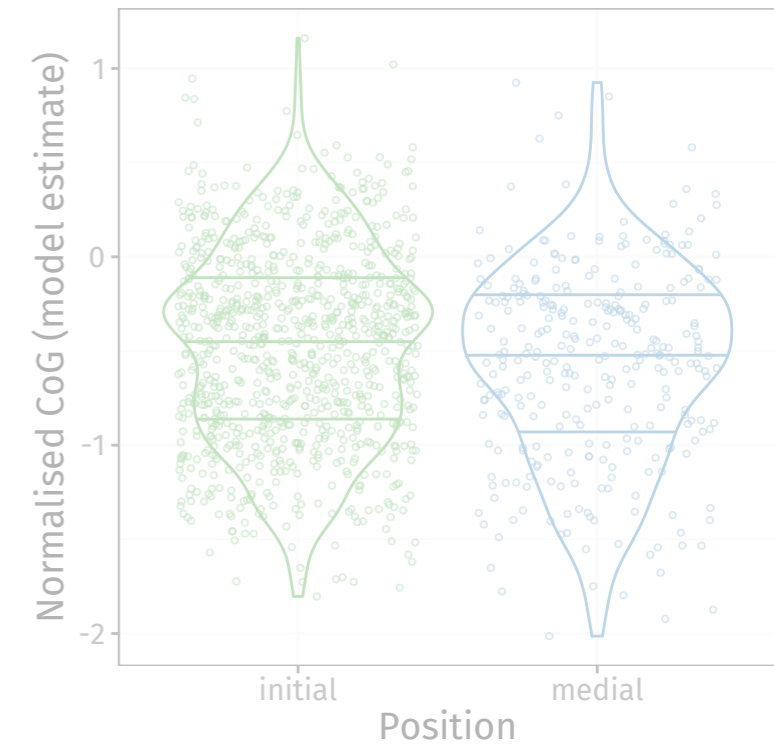
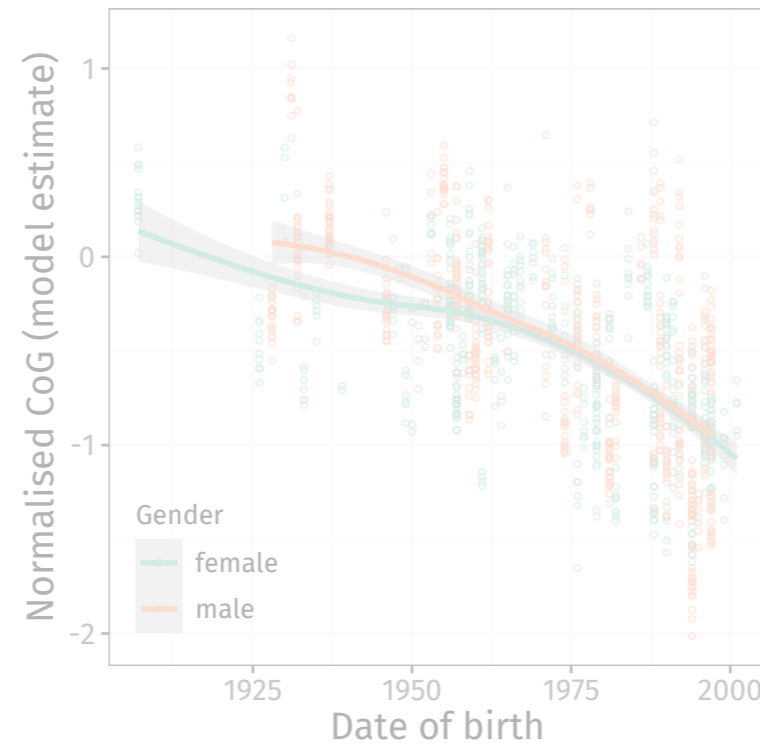


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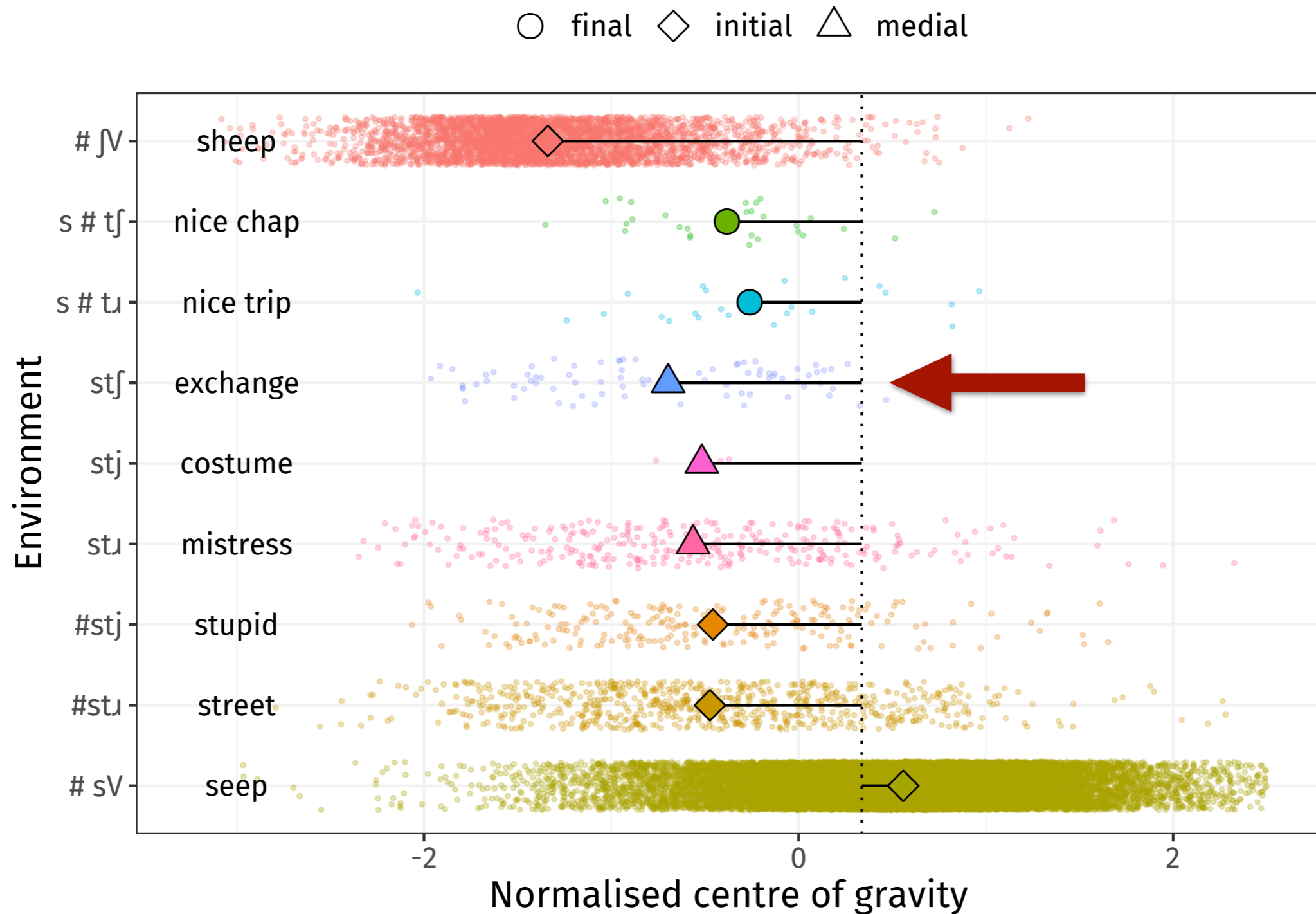
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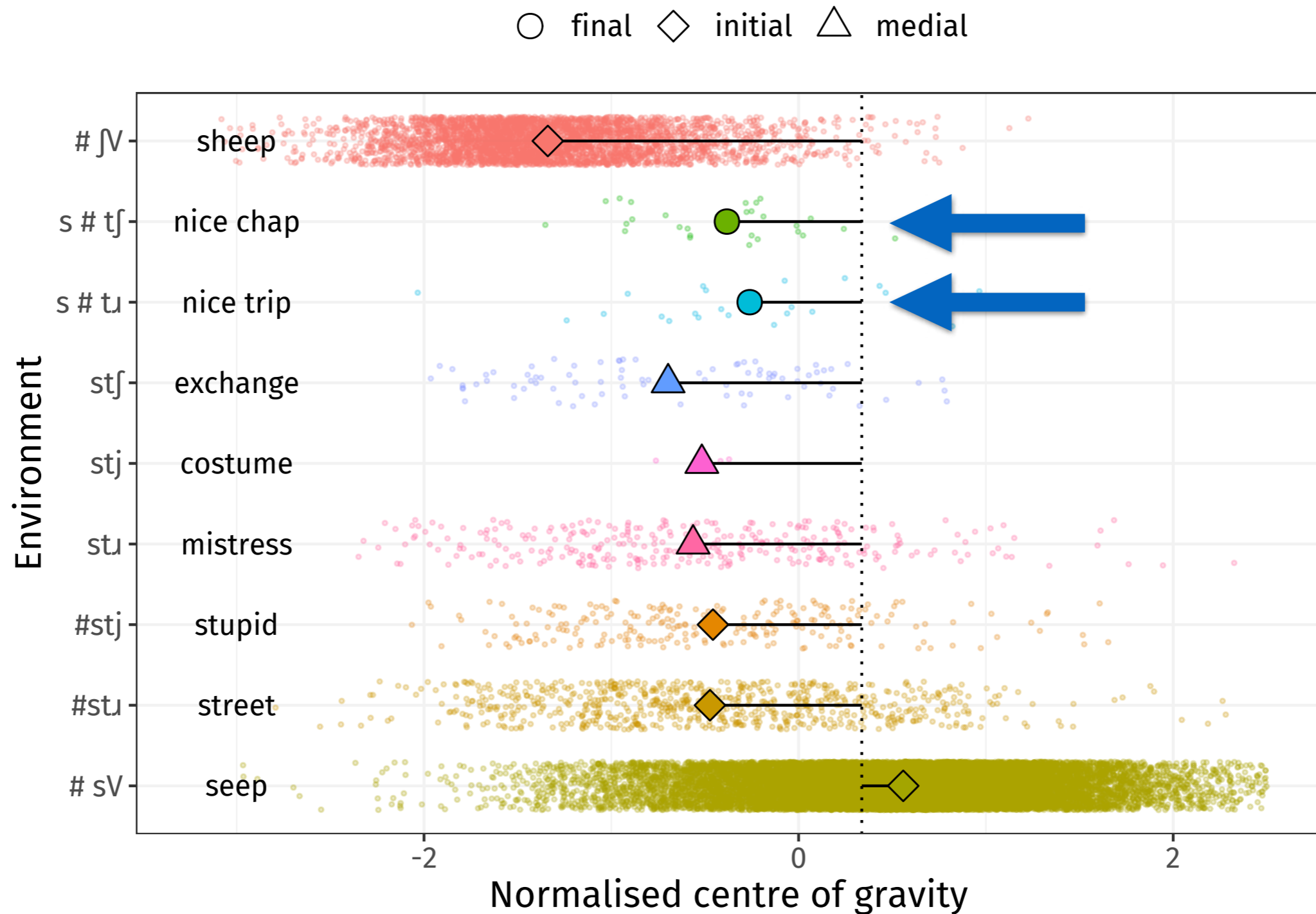
# OTHER ENVIRONMENTS



**Evidence of s-retraction before an affricate, even in the absence of /ɹ/ or /j/**

Also applies across word boundaries (but to a lesser extent, see Zsiga 1995)

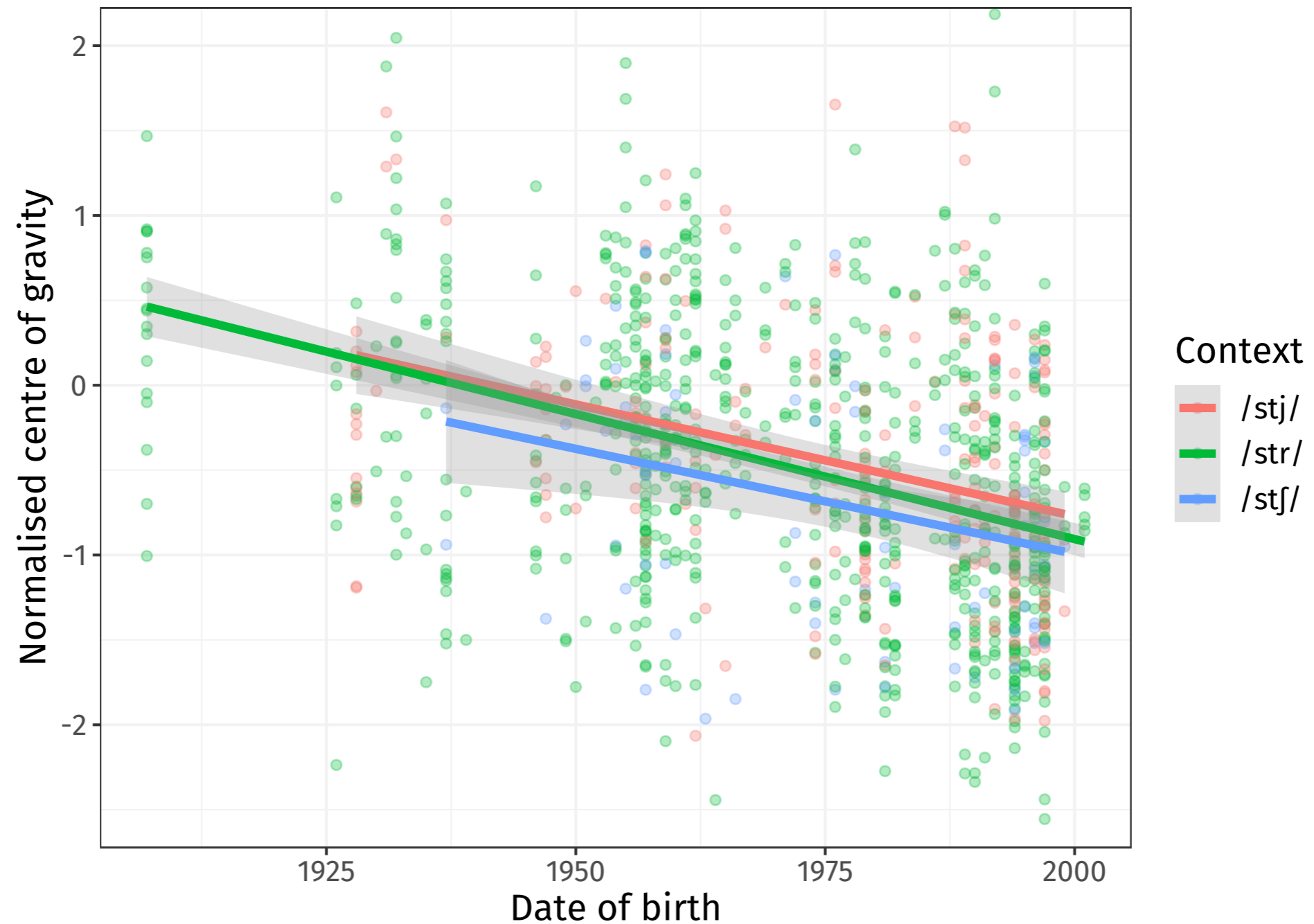
# OTHER ENVIRONMENTS



Evidence of s-retraction before an affricate, even in the absence of /ɹ/ or /j/

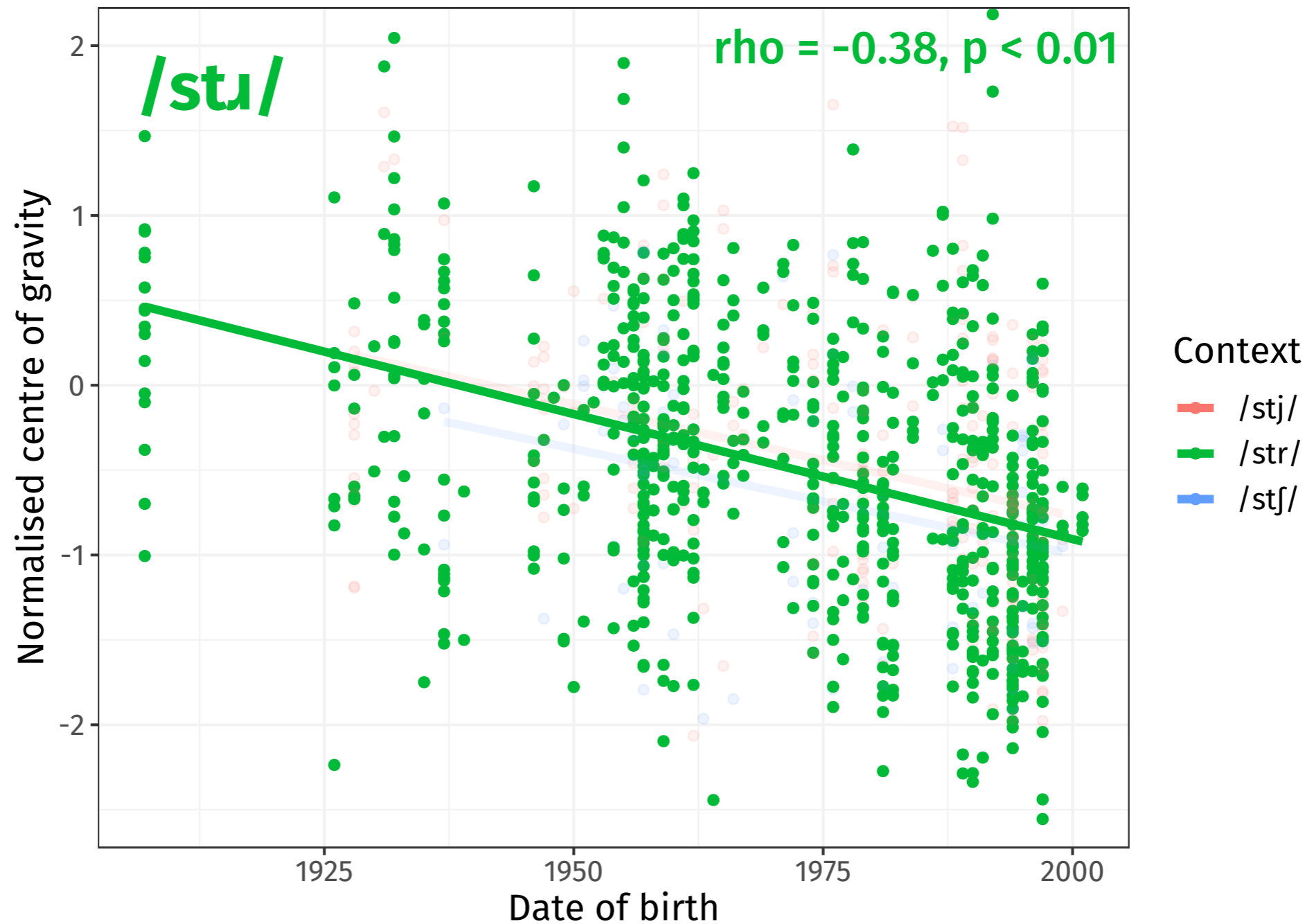
**Also applies across word boundaries (but to a lesser extent)**

# OTHER ENVIRONMENTS



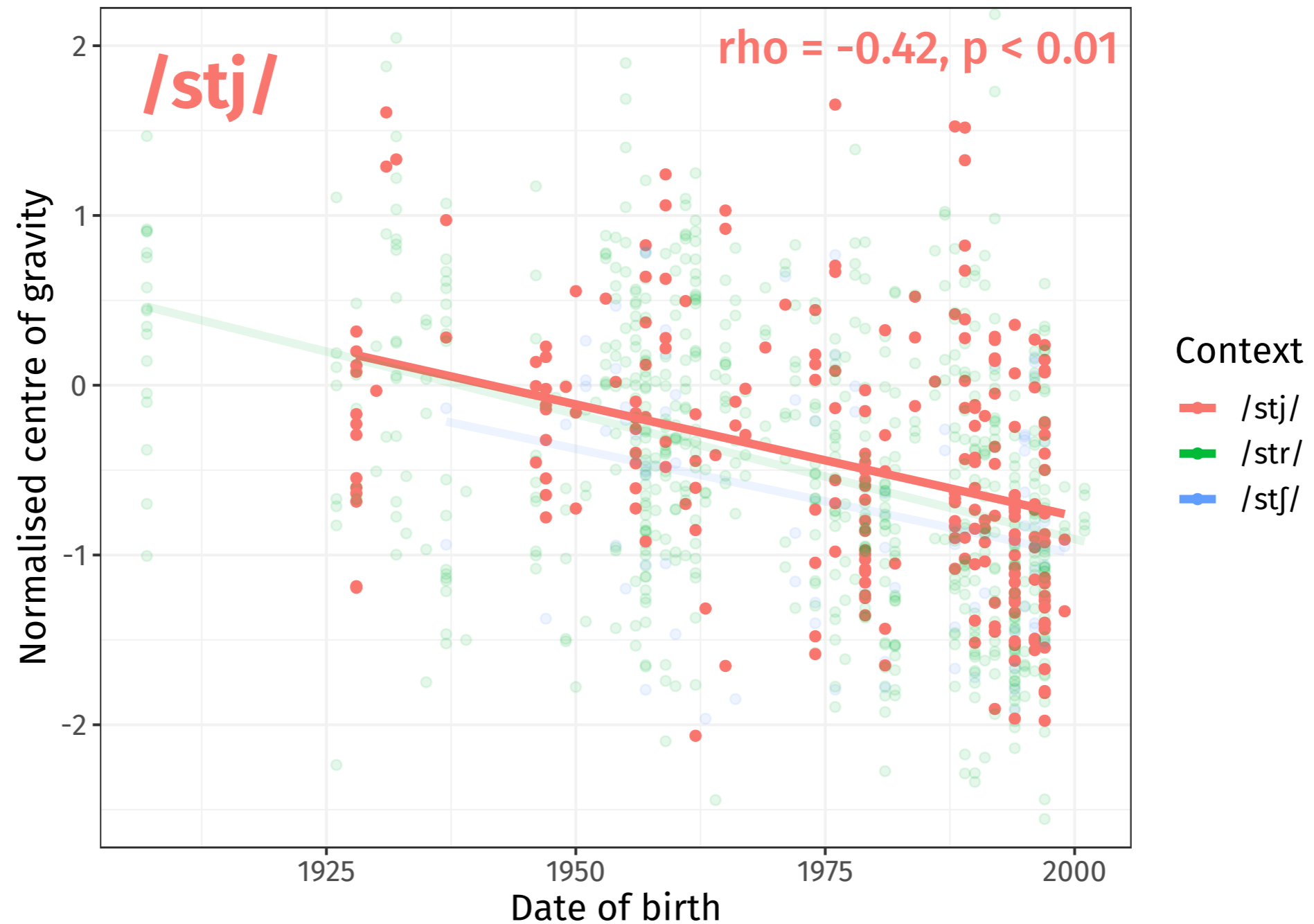
*/stj/* (e.g. *exchange*) also involved in apparent-time change

# OTHER ENVIRONMENTS



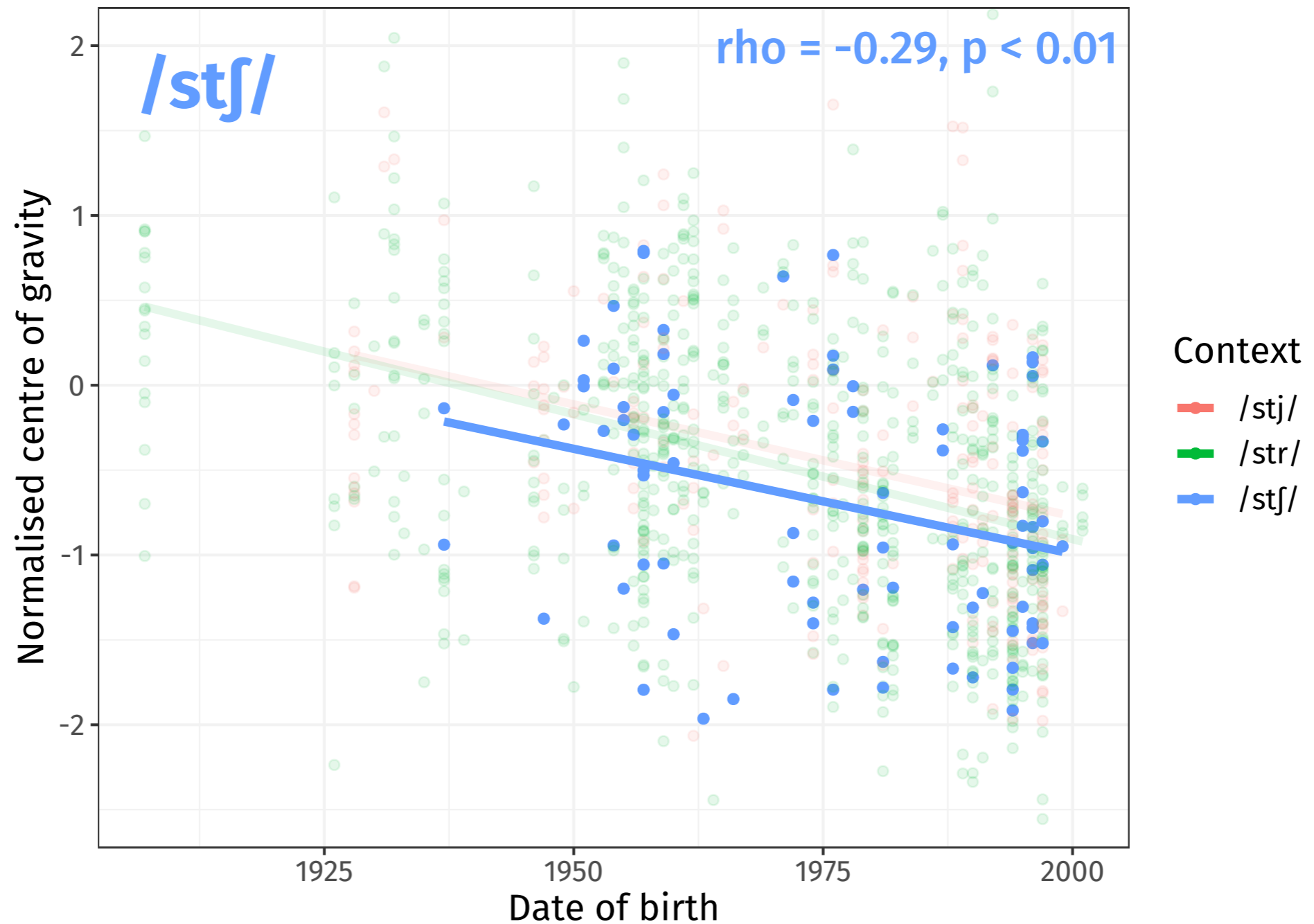
*/stʃ/* (e.g. *exchange*) also involved in apparent-time change

# OTHER ENVIRONMENTS



*/stʃ/* (e.g. *exchange*) also involved in apparent-time change

# OTHER ENVIRONMENTS



/stf/ (e.g. *exchange*) also involved in apparent-time change

# DISCUSSION



# DISCUSSION

/ ʃ t ɹ i: t /

/ ʃ tʃ ɹ i: t /

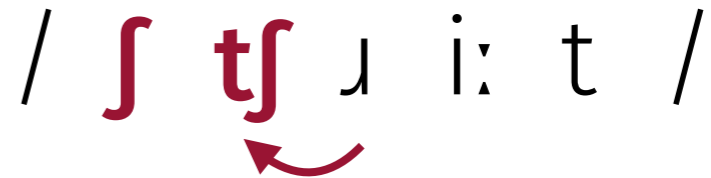
- The case for non-local assimilation:
  - ▶ Baker et al. (2011) on long-distance lingual relationship between /s/ and /ɹ/
  - ▶ phonotactic restriction against [sɹ], suggesting again that there's something more phonetically natural about [ʃɹ]
  - ▶ evidence of local process of /sj/ → [ʃ] (see Zsiga 1995 on *press* vs. *press you* vs. *pressure*)
  - ▶ so there's a clear phonetic motivation as to why /r/ and /j/ could directly cause an /s/ to take on a hushier realisation

# DISCUSSION

/ s t ʌ i: t /



/ s tʃ ʌ i: t /



- The case for local assimilation:
  - ▶ affrication occurs in both environments (Nichols & Bailey 2018; see also Magloughlin & Wilbanks 2016)
  - ▶ affrication as a single underlying cause is the more parsimonious explanation
  - ▶ evidence that /s/ retracts before an affricate even in the absence of /ʌ/ and /j/
    - ▶ both word-internally (e.g. *exchange*) and across word boundaries (e.g. *nice chap*)
  - ▶ lack of retraction in other (non-affricating) clusters with /ʌ/ and /j/, i.e. /spʌ, skʌ, spj, skj/


# CONCLUSIONS

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- First robust evidence of community-level change in BrEng /stʌ/
  - ▶ regular coarticulatory sound change: led by young women, and more advanced in high frequency words and (possibly) working class speech
- New insight into the mechanisms of /s/-retraction:
  - ▶ first quantitative investigation of retraction in /stj/, which is changing in parallel with /stʌ/
  - ▶ although /ɹ/ and /j/ may have *some* direct effect on /s/, this is unlikely to be enough to act as the initiation of this change
- The solution to the actuation problem proposed by Baker et al. (2011) – which relies on covert articulatory variation in /ɹ/ – has not been able to account for this particular instance of /s/-retraction
- Future: fine-grained phonetic realisation of /tʌ/ and /tj/ affrication and their change over time (covariation between /tʌ/-affrication, /tj/-coalescence, and /s/-retraction?)

# Thank you!


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