

Inter- and intra- speaker variance in sound change

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1

Speech Community and Speaker Heterogeneity

2.1

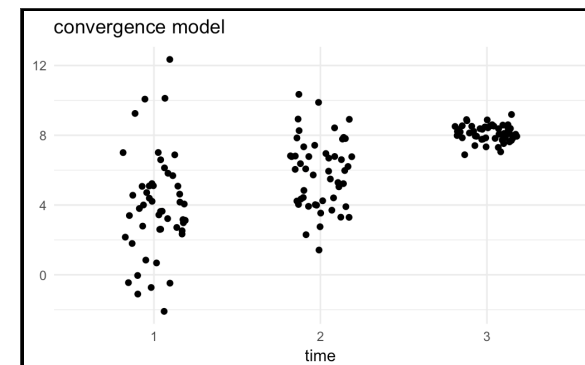
Convergence Model of Sound Change

One model of the actuation & progression of sound change involves *convergence* either across or within speakers on a new norm.

- S-retraction & /r/ heterogeneity in North American English (Baker, Archangeli & Mielke, 2011; Mielke, Baker & Archangeli, 2016)
- The Synchronic Pool of Variation (Ohala, 1981)
- CHOICE Blevins (2004)

2.2

Convergence Model of Sound Change



Inter- or intra speaker variance decreases over time.

2.3

Convergence Model of Sound Change

In the study of sound change in progress, we almost exclusively focus on the location parameters μ of our community & speaker distributions, but hardly ever the scale parameters σ .

In this talk

Examining σ in two changes and two non-changes from the Philadelphia Neighborhood corpus

2.4

Data

- 325 Speakers from Philadelphia
- Interviewed between 1973 and 2013
- Dates of birth from 1889 and 1998
- Force-aligned and formants automatically estimated with the FAVE-suite

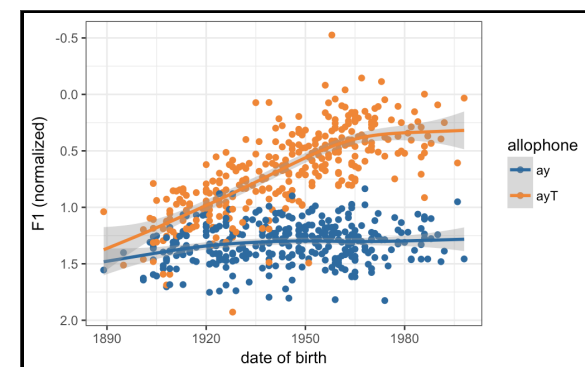
2.5

Modelling

- Bayesian modelling via Hamiltonian Monte Carlo
- Implemented in Stan

2.6

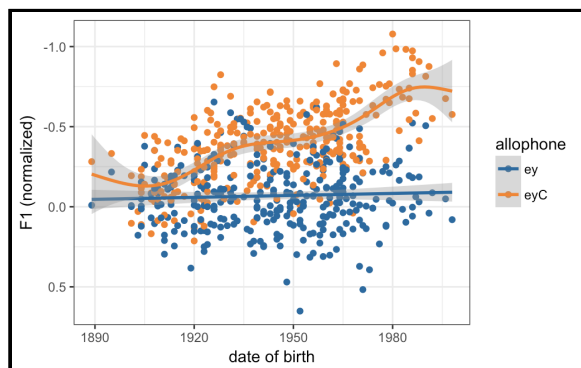
Changes Examined - /ay/ allophones



84,746 tokens

2.7

Changes Examined - /ey/ allophones



46,152 tokens

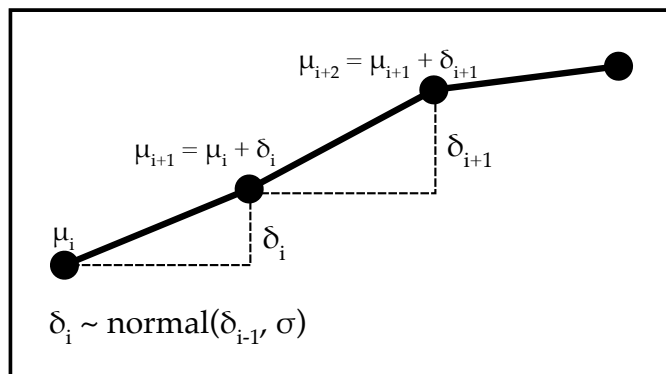
2.8

Intra-speaker variance model

3.1

Description

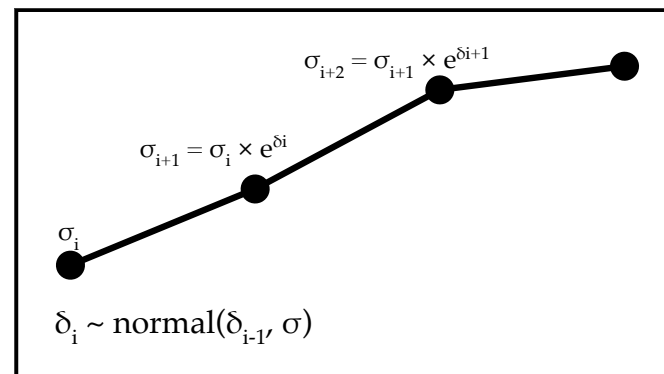
Location autoregression model



3.2

Description

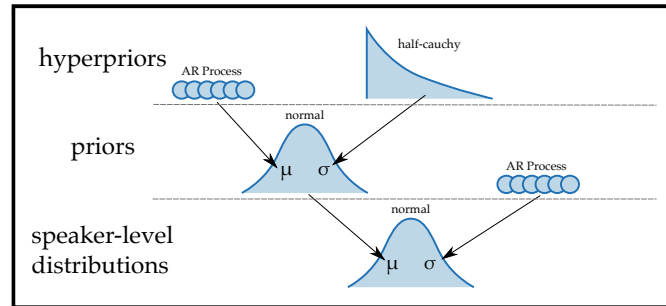
Scale autoregression model



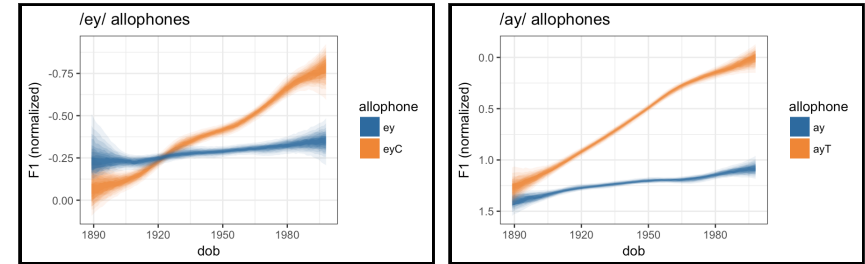
3.3

Description

Intra-speaker variance model



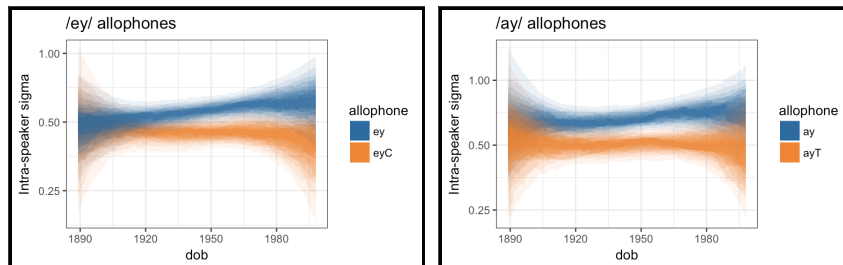
Results



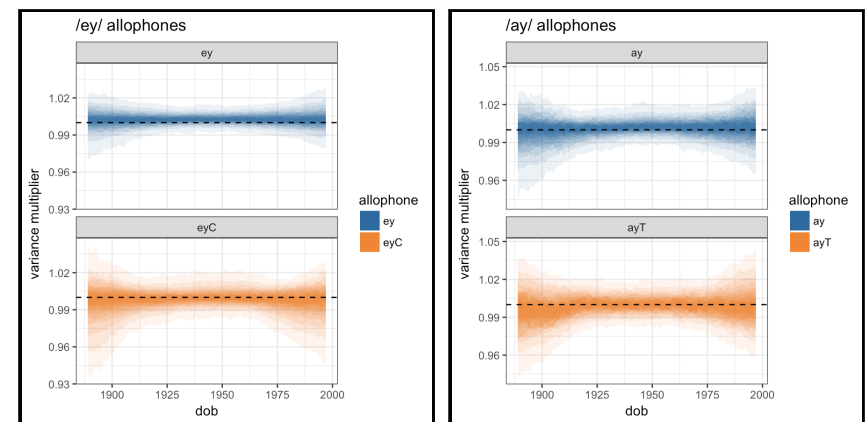
3.4

3.5

Results



Results



3.6

Conclusion

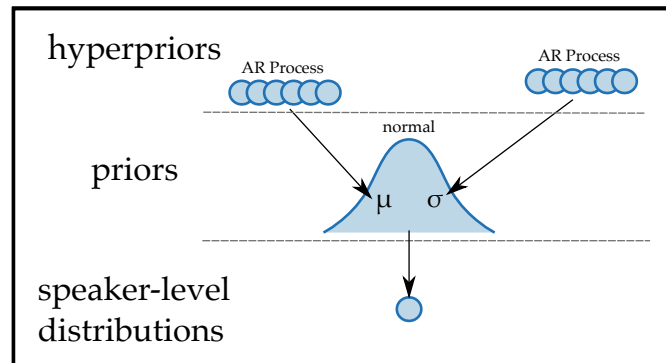
The degree of intra-speaker variance remained remarkably consistent across the 20th century

Inter-speaker variance model

3.8

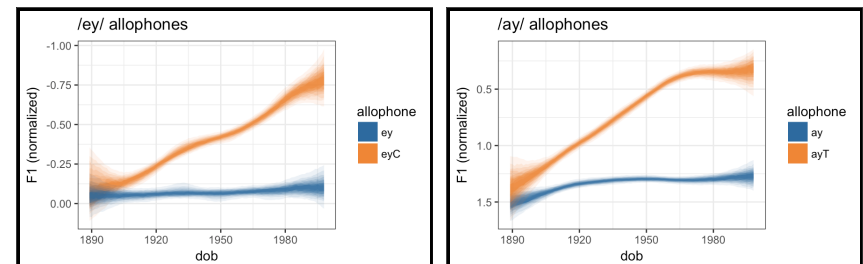
4.1

Description



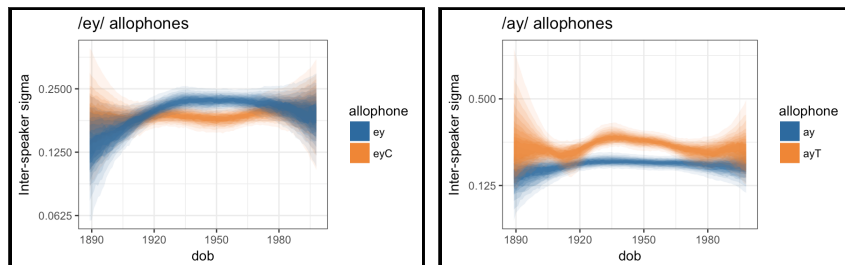
4.2

Results



4.3

Results



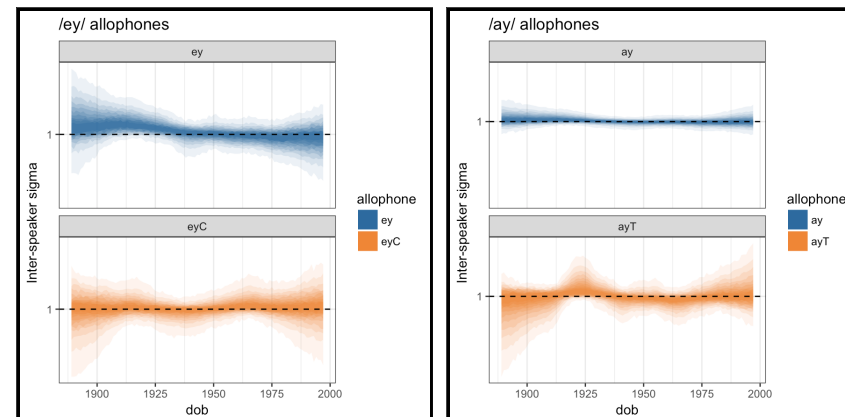
4 . 4

Conclusion

The degree of inter-speaker differences has also remained remarkably consistent across the 20th century.

4 . 6

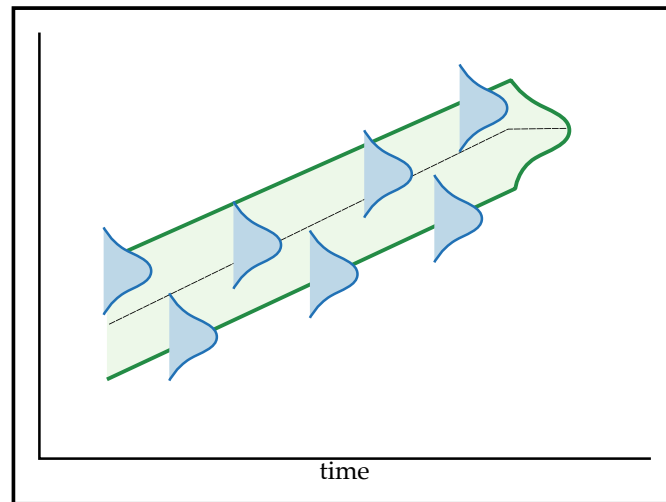
Results



Discussion

5 . 1

Resulting Picture



5.2

5.3

Gaps

To explore in the future:

- Greater exploration of the by-speaker estimates
- Outlier speakers/tokens (Labov et al 2010)
 - t or cauchy distributions?

The End

6.1