

Inter- and intra- speaker variance in sound change

Josef Fruehwald



THE UNIVERSITY
of EDINBURGH

Speech Community and Speaker Heterogeneity

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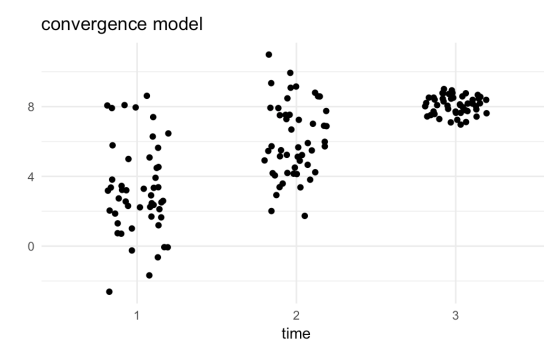
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Convergence Model of Sound Change

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, 1989)
- CHOICE Blevins (2004)

Convergence Model of Sound Change



Inter- or intra speaker variance decreases over time.

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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

Philadelphia Neighborhood Corpus

- 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

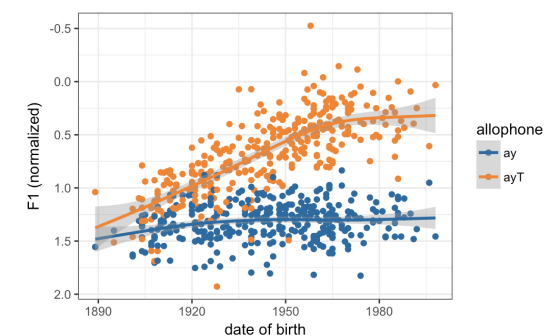
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Modelling

- Bayesian modelling via Hamiltonian Monte Carlo
- Implemented in Stan

Changes Examined - /ay/ allophones

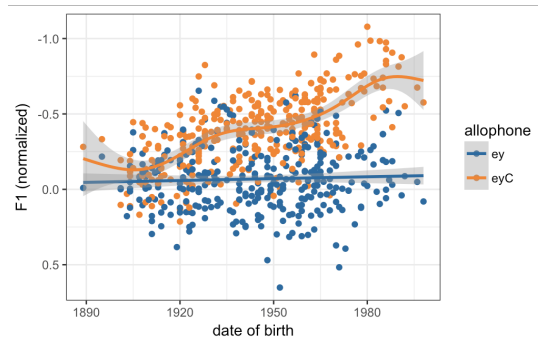


84,746 tokens

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Changes Examined - /ey/ allophones



46,152 tokens

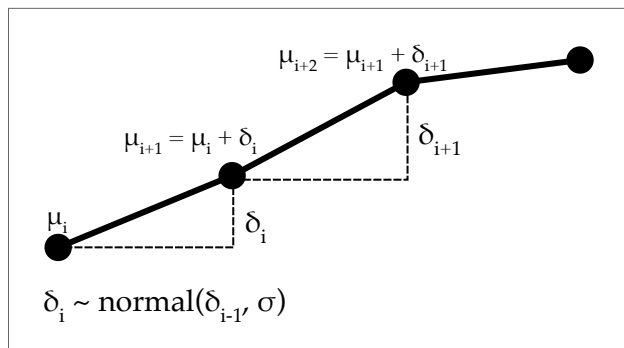
Intra-speaker variance model

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Description

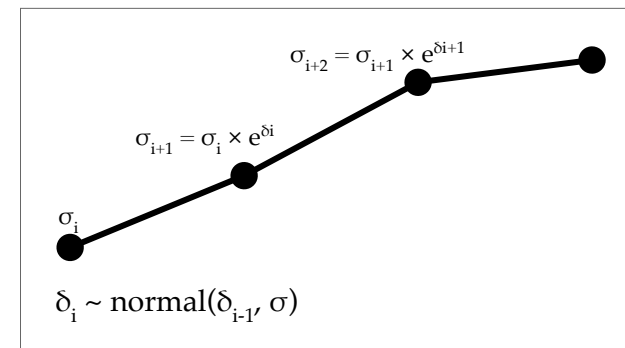
Location autoregression model



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Description

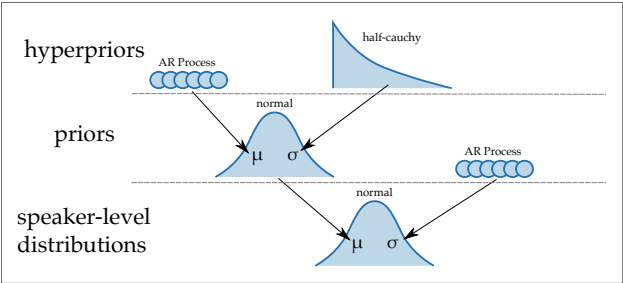
Scale autoregression model



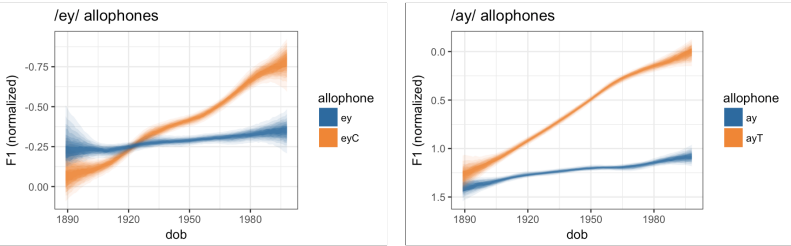
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Description

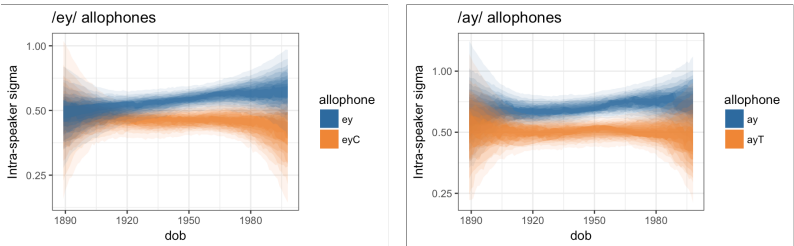
Intra-speaker variance model



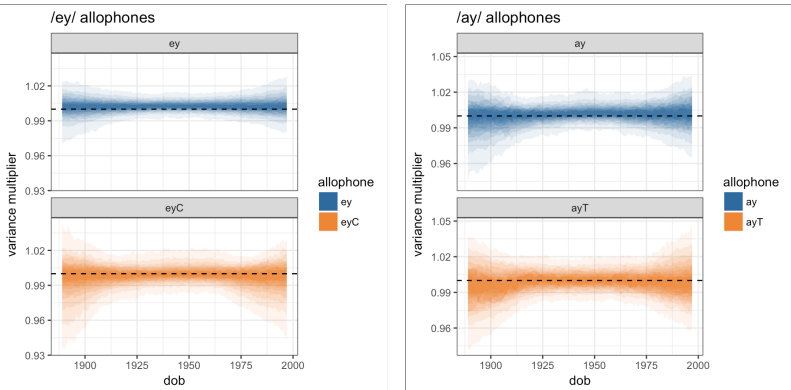
Results



Results



Results

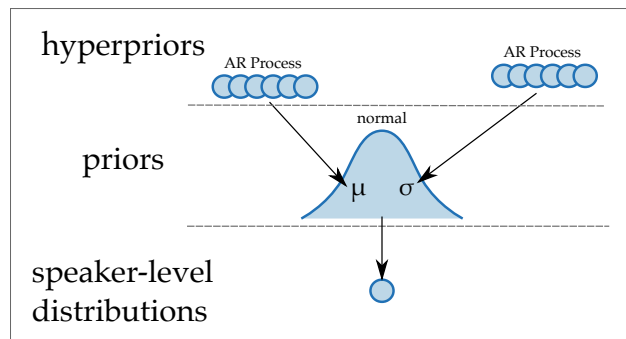


Conclusion

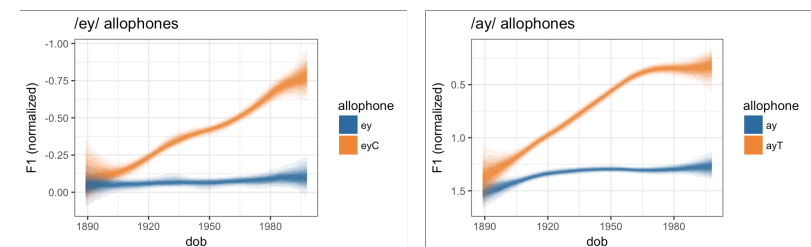
The degree of intra-speaker variance remained remarkably consistent across the 20th century

Inter-speaker variance model

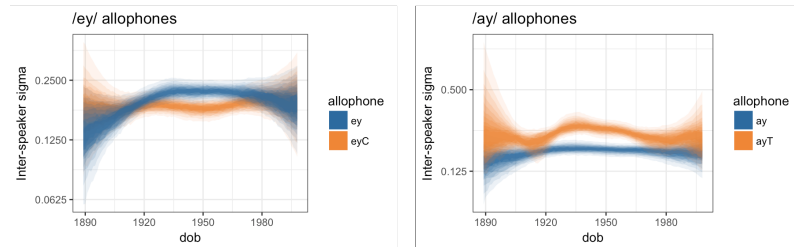
Description



Results



Results



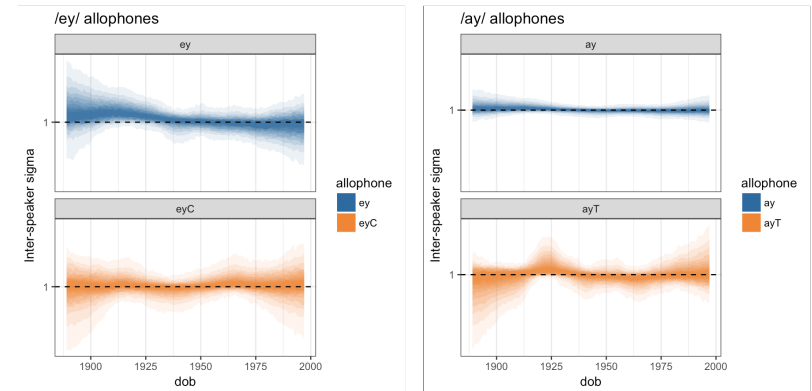
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Conclusion

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

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Results

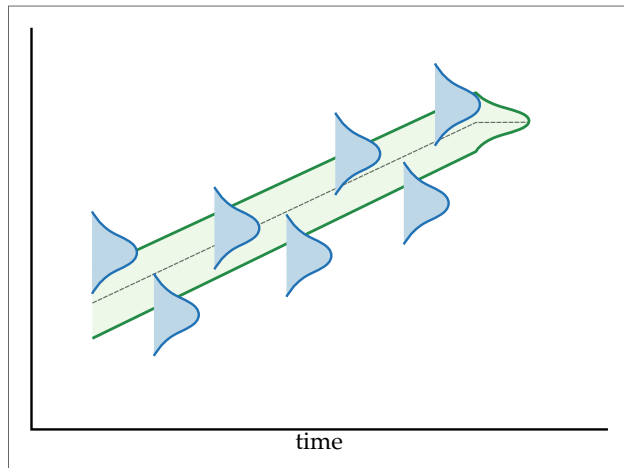


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Discussion

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Resulting Picture



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