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Punctuated Evolution and the Social Dynamics of Language Diversification

Thomas Paul Roberts, Paul Widmer, and John Mansfield
2025 New Advances in Phylolinguistics, Leipzig



Wikipedia. User: Nomadtales. Huli Wigman from Hela Province of Papua New Guinea.



Overview

1. Language Contact
 2. Punctuated Evolution
 3. Methods
 4. Preliminary Results
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Language Contact

Expectations

Linguistic Contact

- Convergence is common (particularly in structures)
- Divergence is being increasingly documented (see Evans 2019)
- Not only in the lexicon
- Why does divergence/non-convergence occur?

Schismogenesis

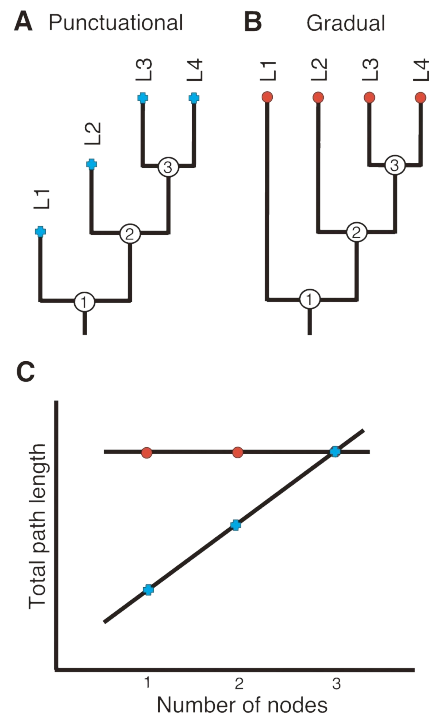
- Tendency for humans to magnify social and cultural differences
- Increases group cohesion
- Escalates distinctions between groups
- Tag-based → language

Punctuated Evolution

What's responsible?

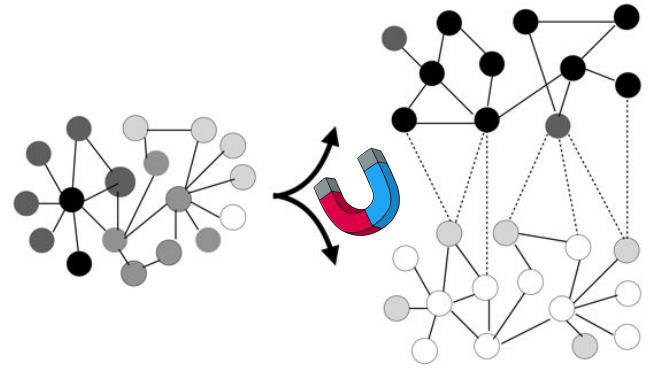
Punctuated Evolution

- *Punctuated Equilibrium* (Eldredge & Gould 1972)
- Greenhill et al. 2017 suggested that schismogenesis could drive punctuated evolution
- Could alternatively be due to founder effect, external contact, or methodological bias



Mechanism

- Use of linguistic variant becomes a marker
- People avoid/overuse certain variants
- Accumulation of variant selection causes rapid diversification
- Repulsion effect: population becomes polarised and splits
- Intra-group variation becomes redistributed over social lines

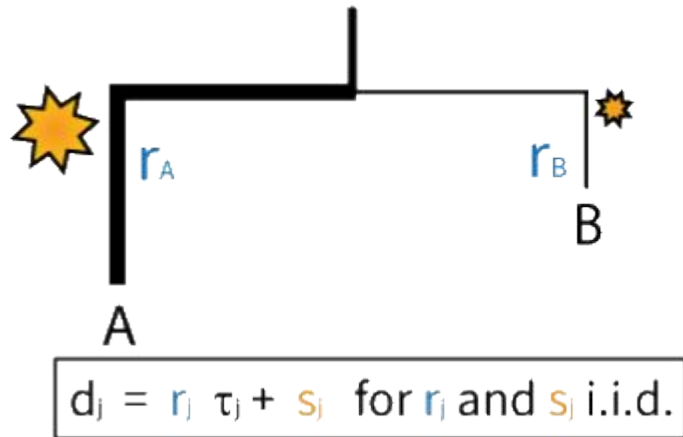


Methods

Modelling the effects of schismogenesis

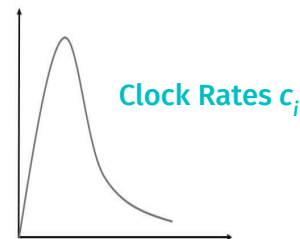
GammaSpike

- Relaxed clock and ‘relaxed’ bursts
- Punctuations inferred alongside topology



GammaSpike

(e.g. for constant l_i)

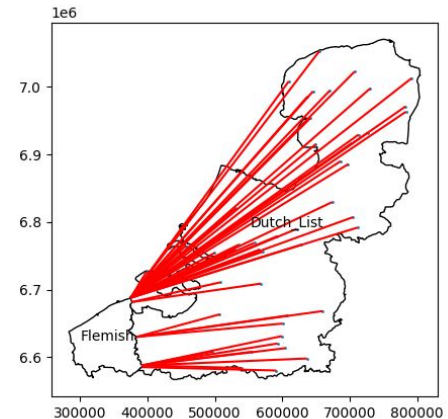
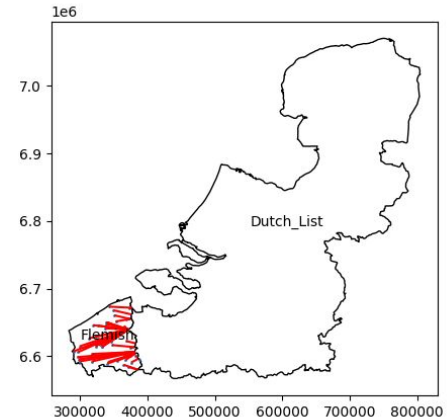


Predictors of Schismogenesis

- Geographic Distance ~ Level of Contact
 - Literary Culture ~ Prestige
 - Presence of Strong Phonological Tags
 - Genetic Similarity ~ External Contact?
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Polygons ~ Contact

- From the *Glottography* project
- Inspired by Matsumae et al. (2021), but asymmetric
- Distances from one to the other



Families

Indo-European

Dravidian

Uto-Aztecan

Uralic

Sino-Tibetan

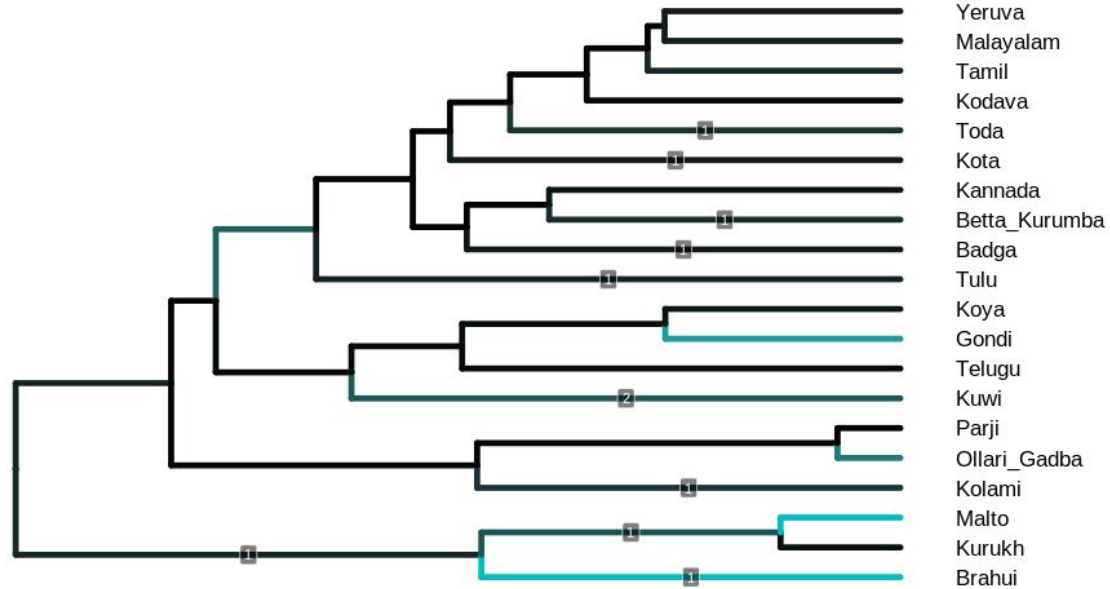
Austronesian

Pama-Nyungan

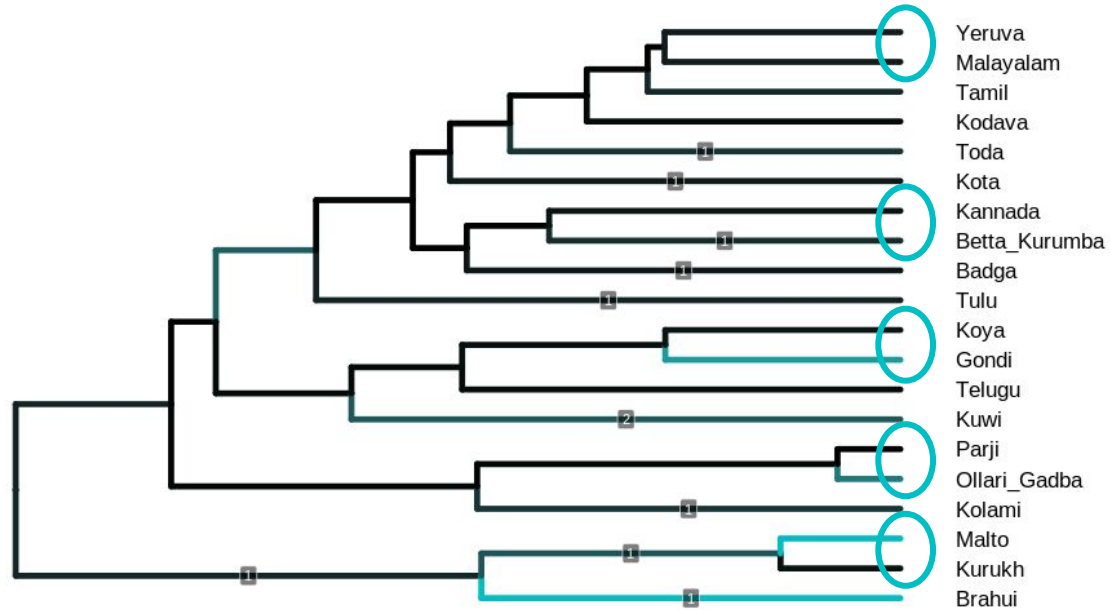
Preliminary Findings

Early results

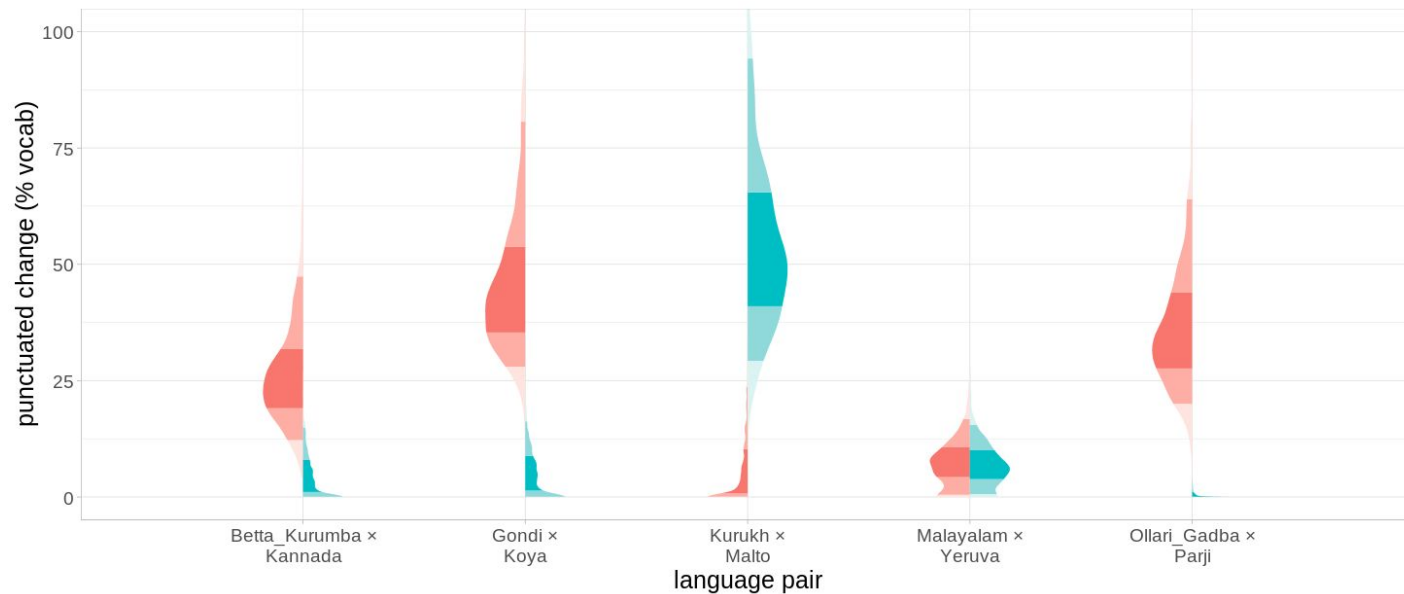
Dravidian



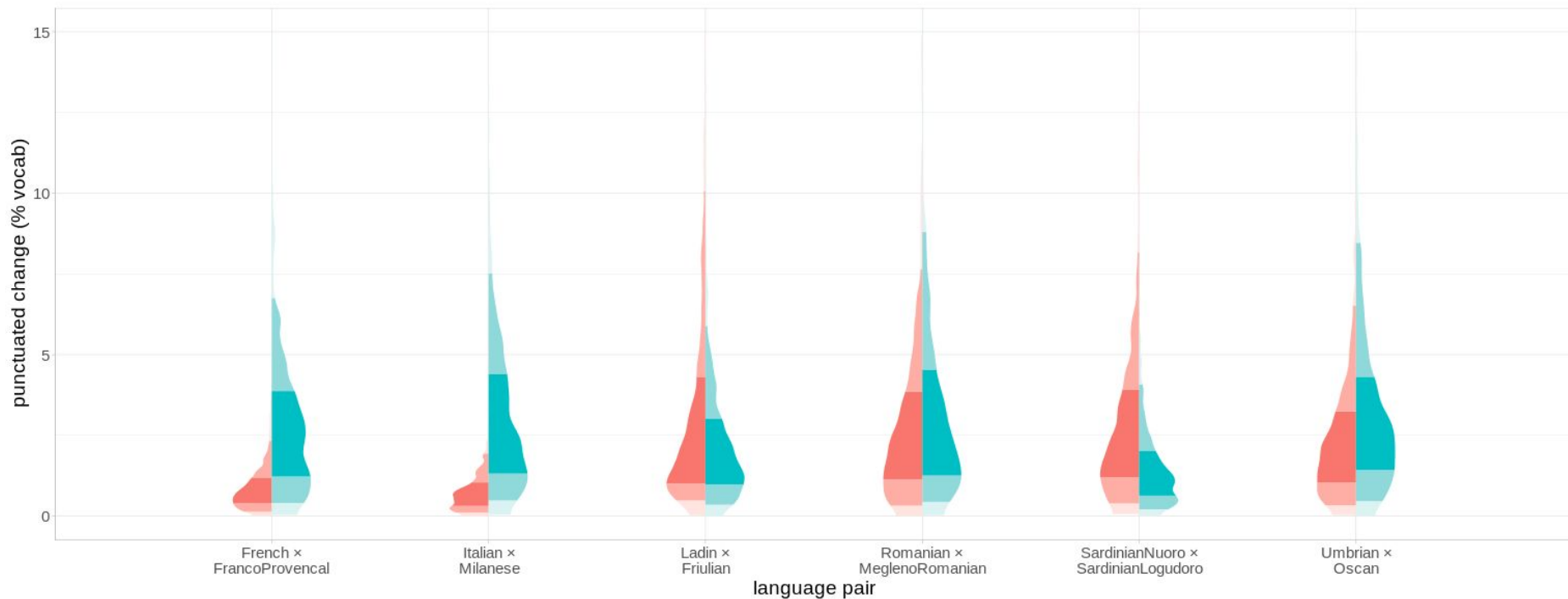
Dravidian



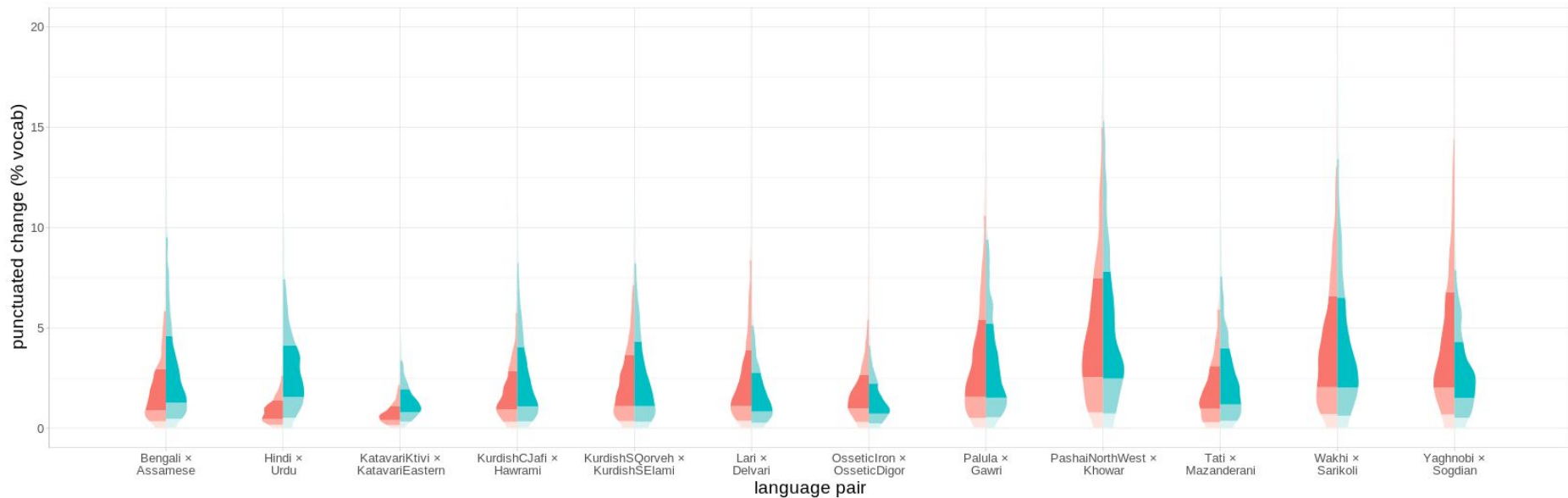
Dravidian



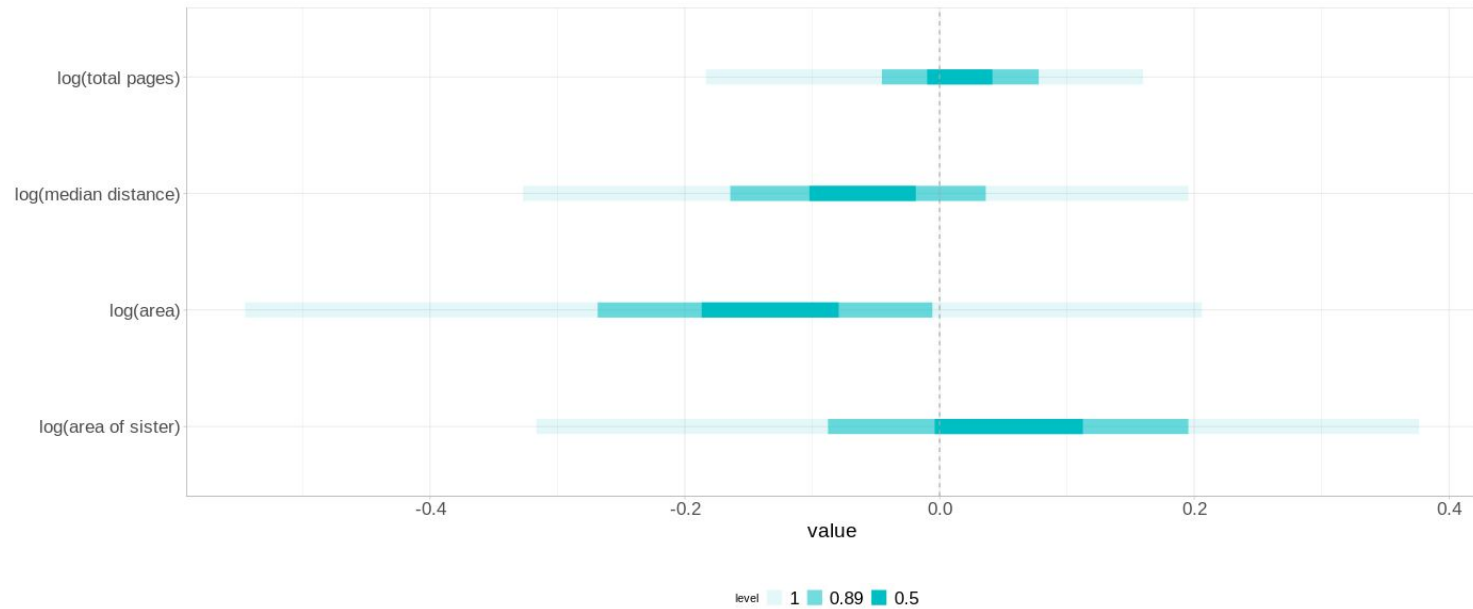
Indo-European: Italic



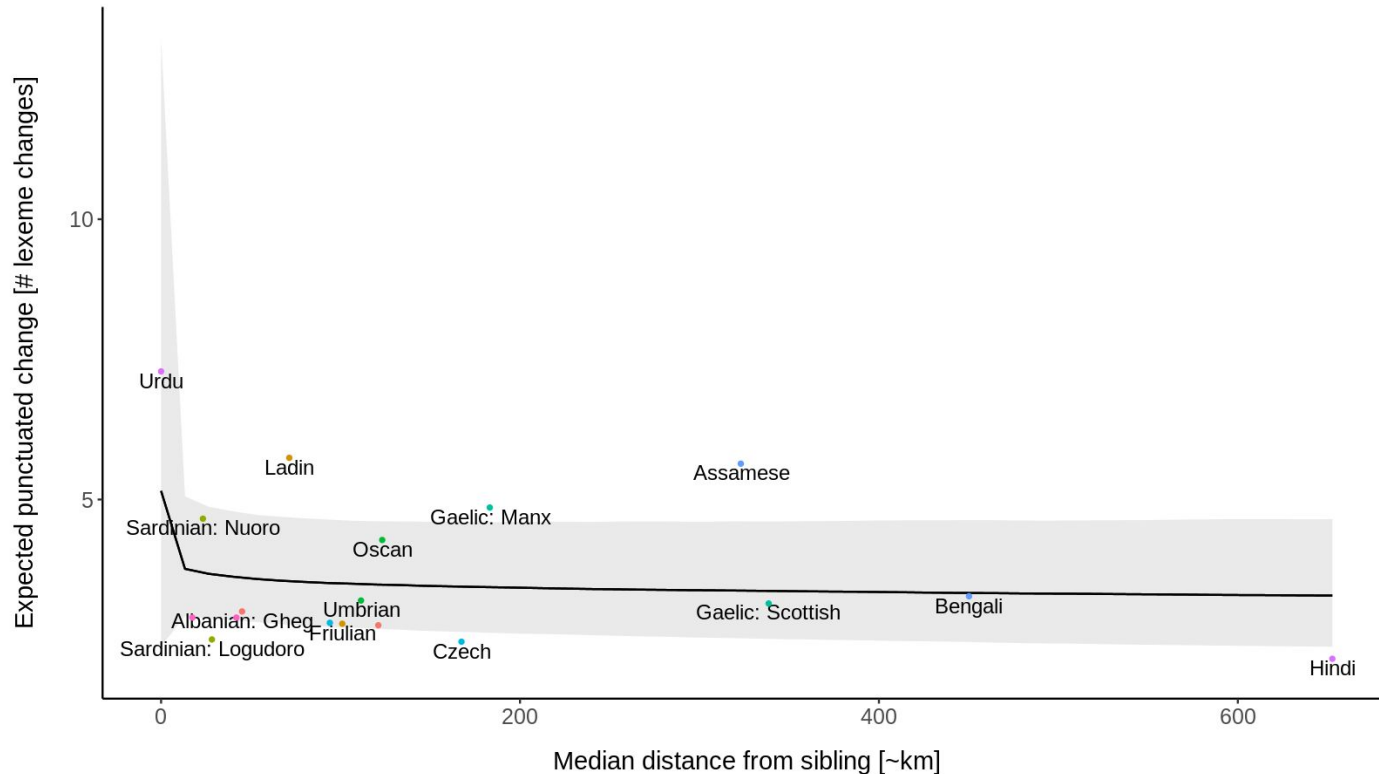
Indo-European: Indo-Iranian



Indo-European GLM



Indo-European Distance effect



Next Steps

Many other things

Still to do

- Run model on other language families
 - Collect missing polygons
 - Control for literary culture
 - Control for phonological differences
 - Investigate external contact
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Questions?

Thoughts? Suggestions?
