

Translation as Transmission:

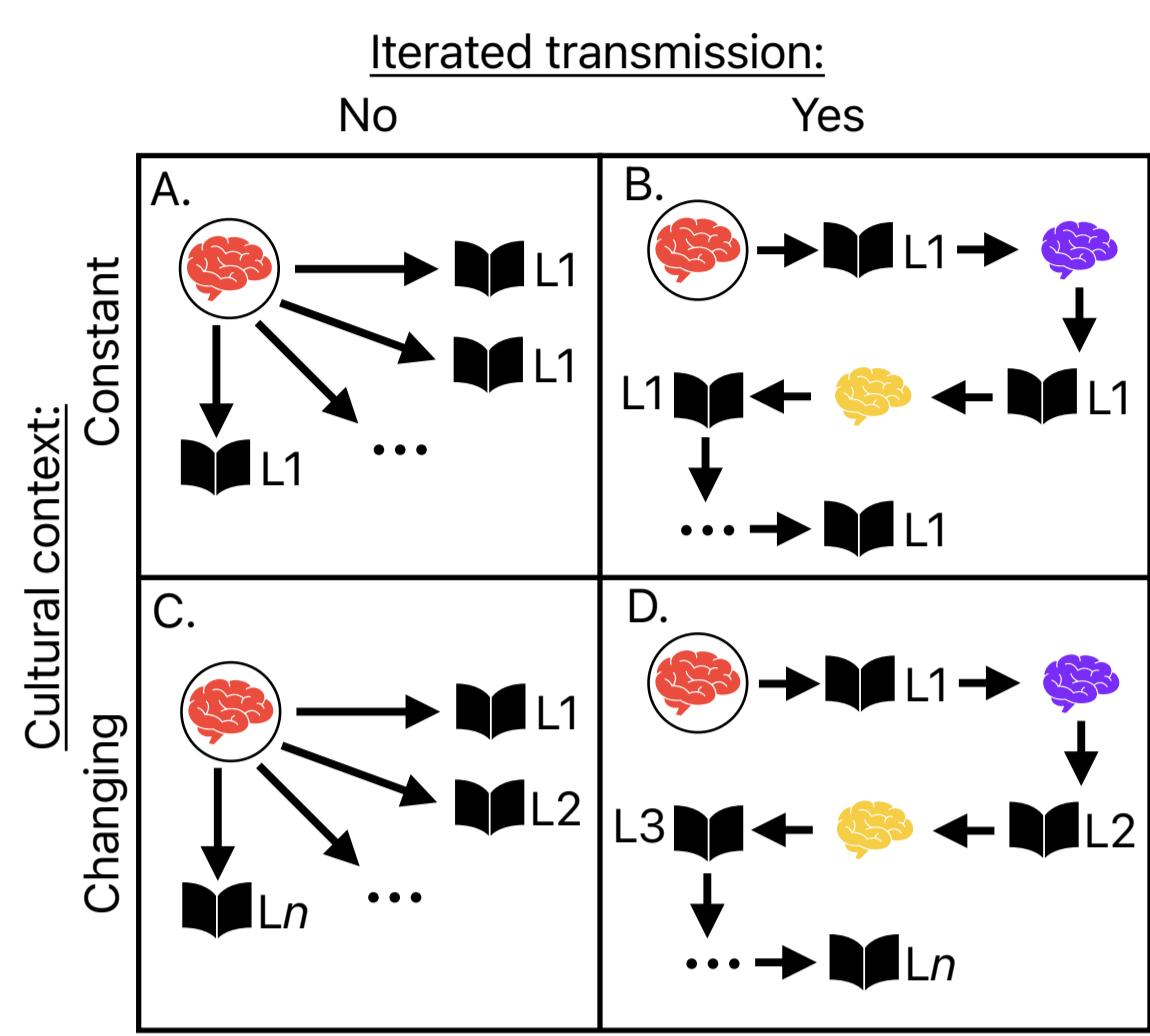
Disentangling the impact of cultural context from cultural transmission using an unusual English-to-English cycle of 19th century literary translations

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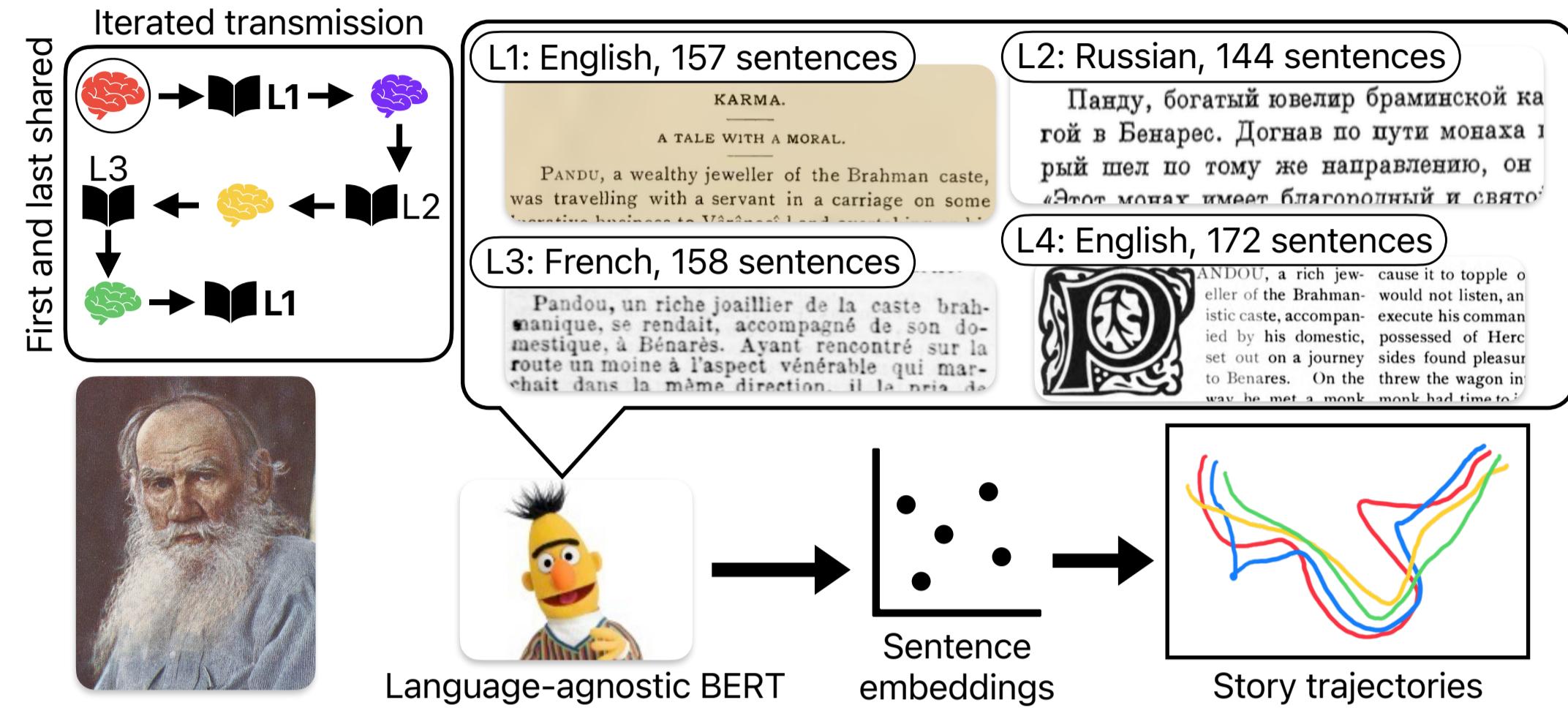
I. Cross-cultural Transmission

- Cultural products (folktales, myths, songs, etc.) change over time due to (A) stochastic reproduction, (B) iterated transmission, (C) change in linguistic/cultural context, etc.
- In real-world, iterated transmission often confounded with new cultural contexts!
- Difficult to disentangle impacts of transmission from impacts of changing context



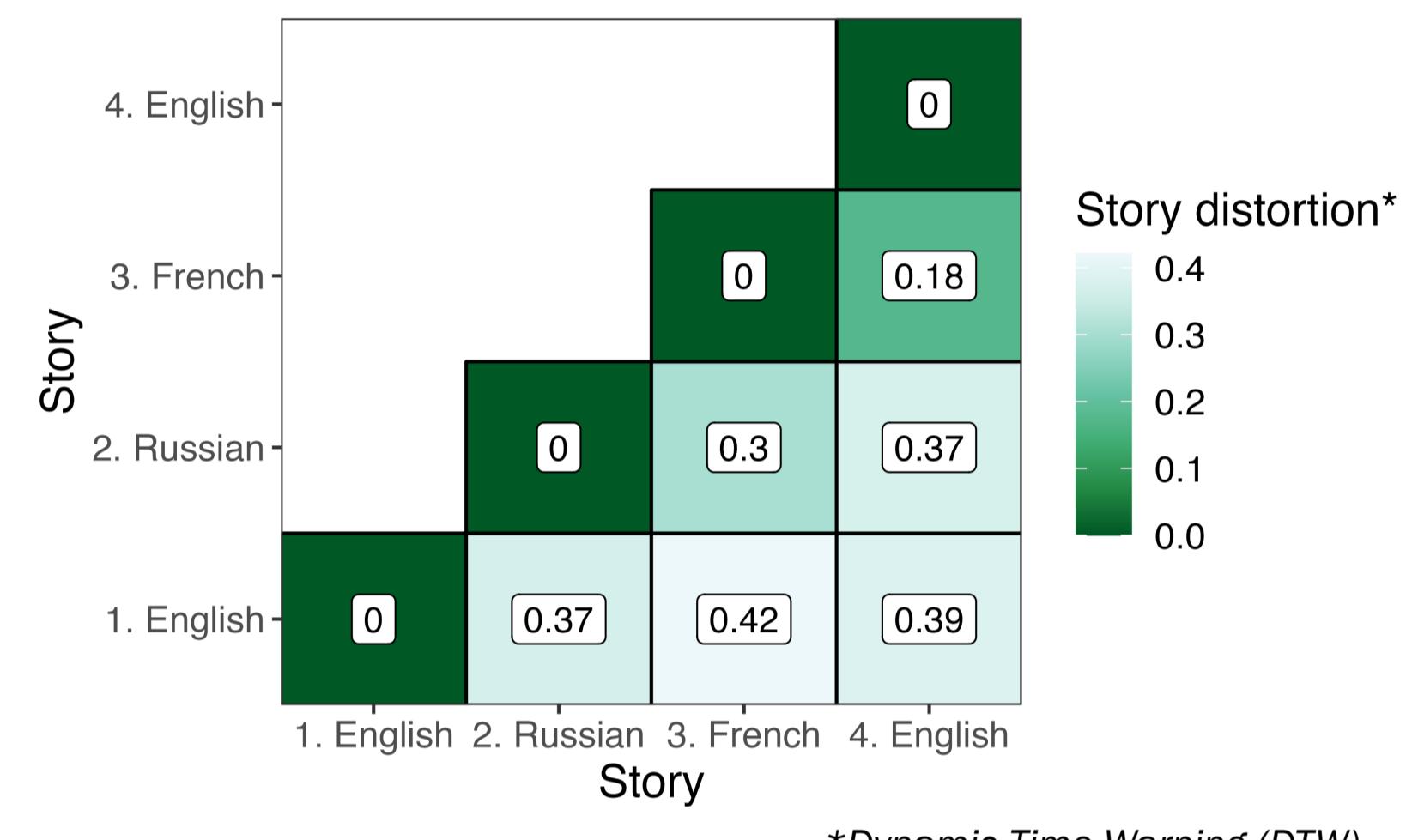
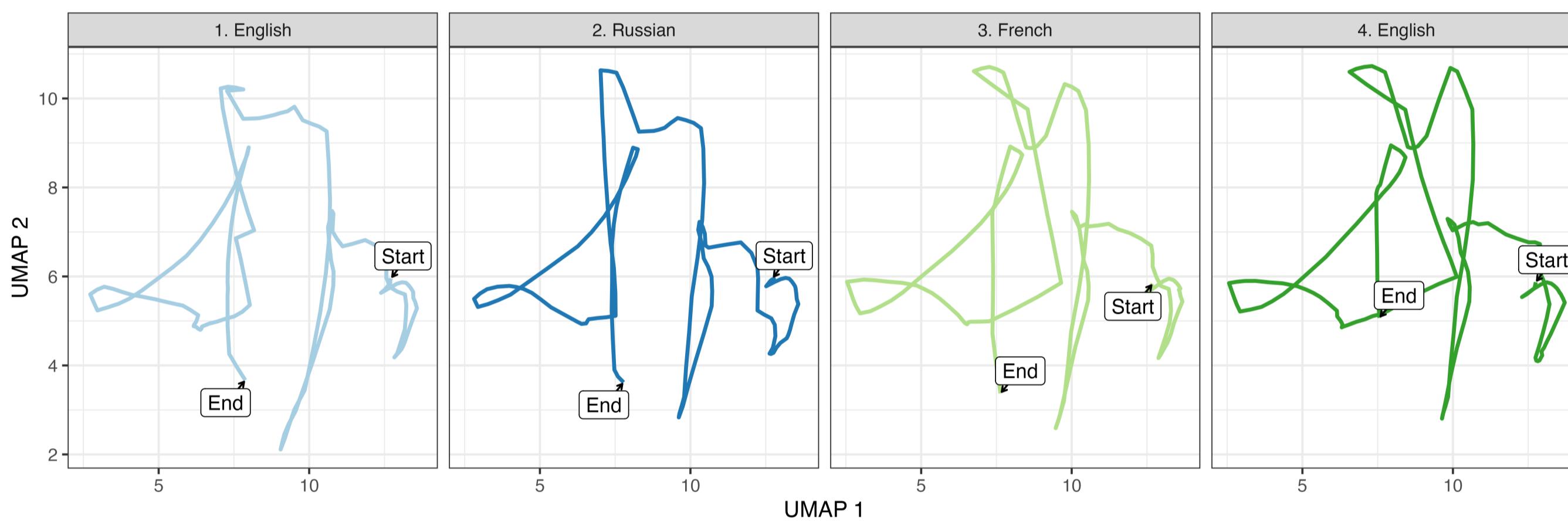
II. Curious Case of Karma

- Translation chain: Story published in Chicago, USA in English iteratively translated until republished in English 2 years later
- Starting & ending in same linguistic/cultural context isolates effect of language/culture from effects of iterated transmission



III. “Plot lines” and Distortion

- Story trajectories preserved and gradually transformed:



Iterated transmission → Incremental distortion of plot
Shared language & culture → More similar plots

IV. Minimal Model of Cross-cultural Transmission

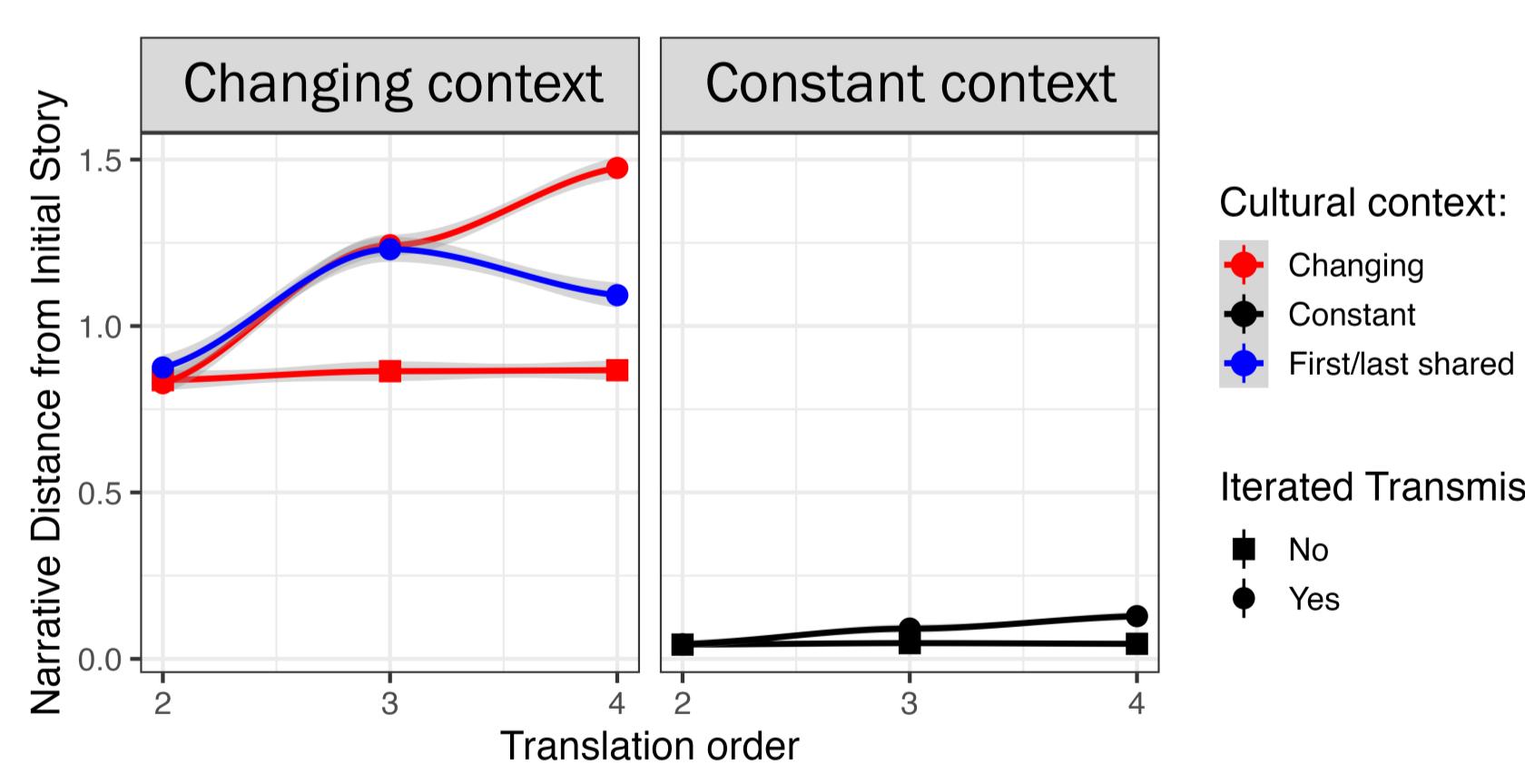
- Agents produce “sentences” in their language (points in 2D semantic space) to tell a story (trajectory in semantic space)
- When retelling a story, agents choose sequence of sentences that best reconstructs the story’s trajectory

Cultural context

- **Changing:** each agent has a unique language
- **Constant:** all agents have a shared language

Iterated transmission

- **No:** each agent tries to retell the same initial story
- **Yes:** each agent tries to retell the previous agent's version



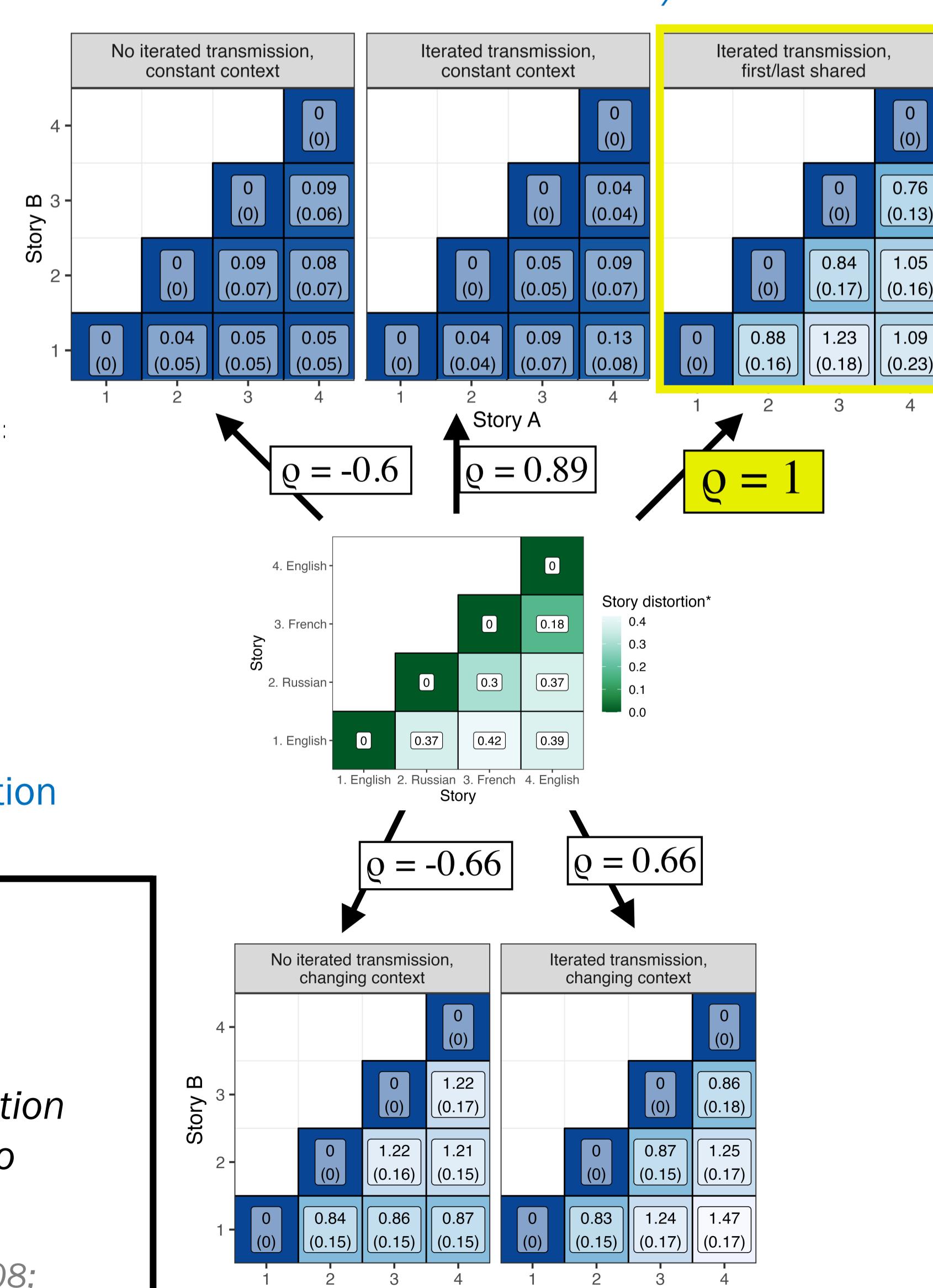
Iterated transmission → Incremental distortion of plot

Shared language & culture → More similar plots

Sharing first & last language → Dampens the incremental distortion

V. Comparing Model to Real Data

- Karma's translation chain matches model with iterated transmission & shared first/last context



VI. Conclusion

- New pipeline for analyzing cross-cultural translation using NLP/ML techniques
- Translation as a model system for studying cultural evolution:
 - Aims to preserve plot... but iterated transmission introduces incremental distortion
 - Unusual “translation chains” that begin & end in same language: opportunity to isolate effects of transmission from effects of changing language