Background
Regressive Cross-Linguistic Influence
Speech Rhythm
Methods
Participants
Procedure
Analysis
Results
Discussion

Regressive Cross-Linguistic Influence in Multilingual Speech Rhythm:

The Primacy of Typological Similarity

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Boston University

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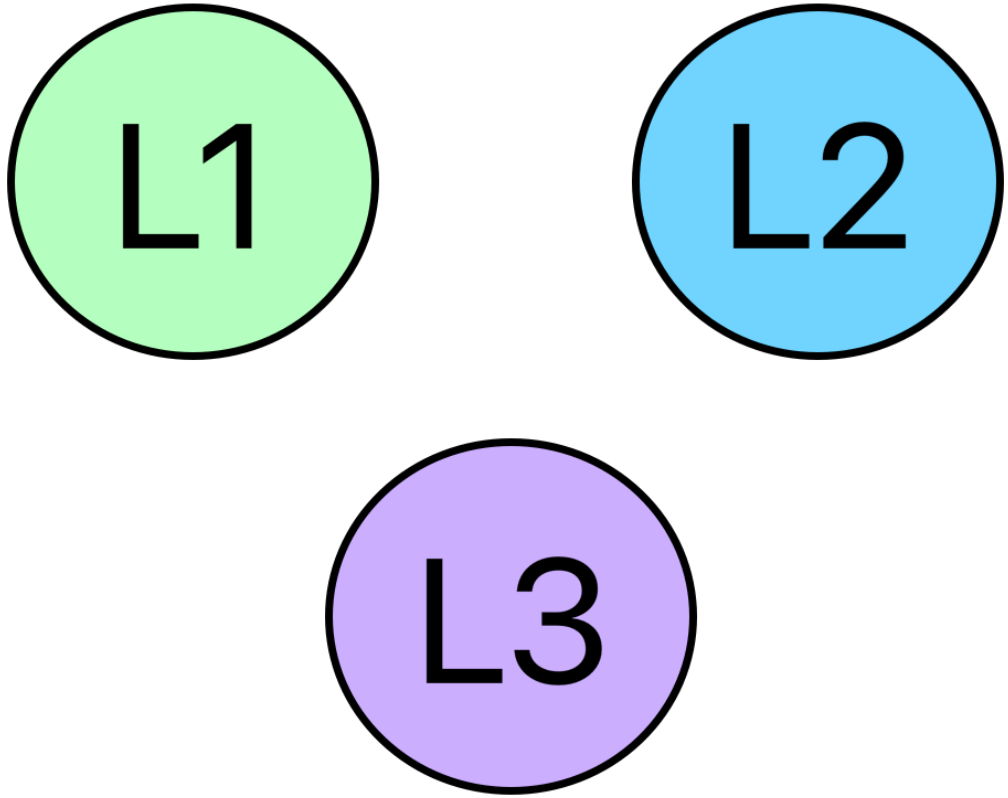
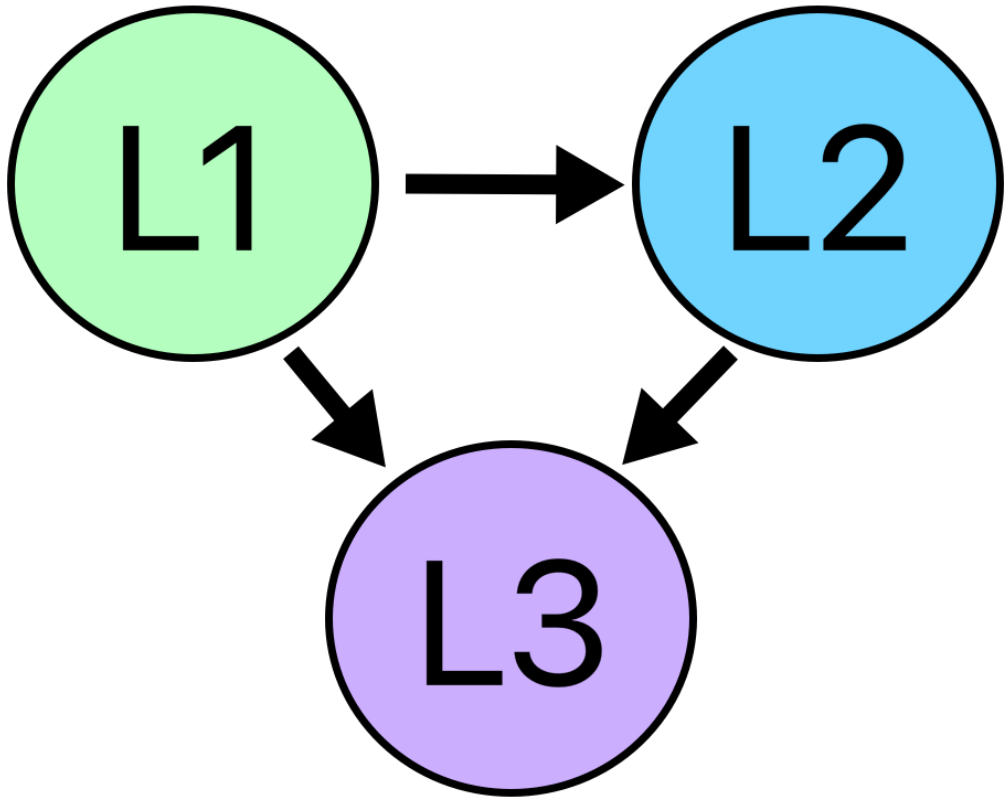
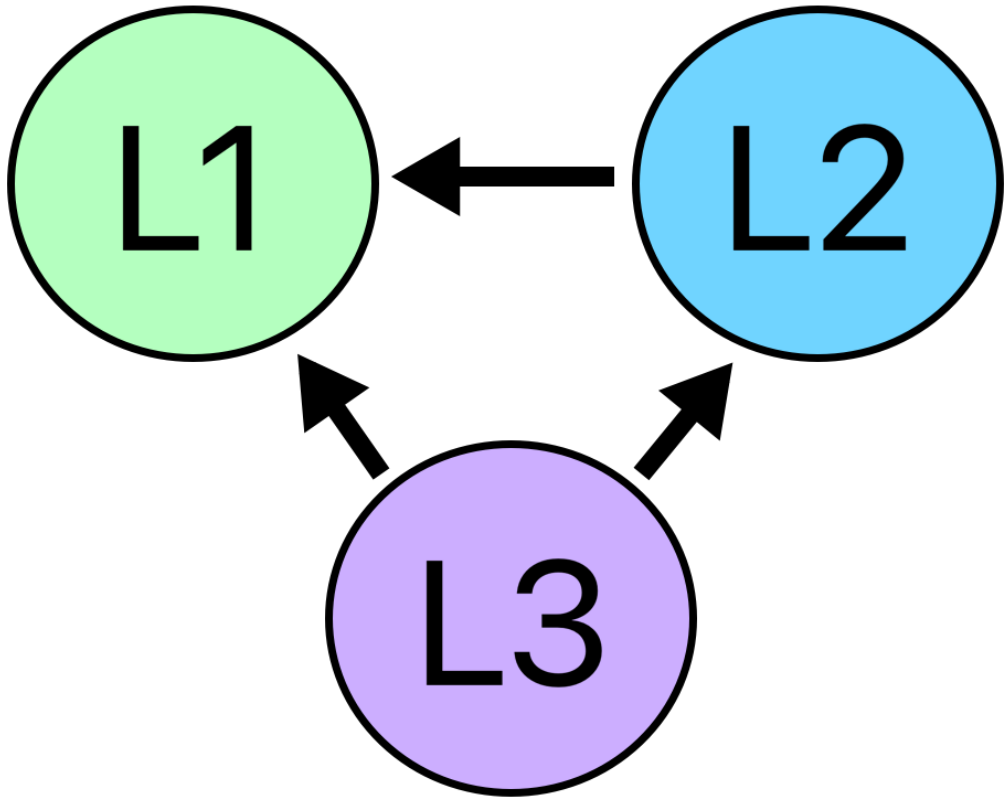
Cross-Linguistic Influence



Progressive Cross-Linguistic Influence (pCLI)



Regressive Cross-Linguistic Influence (rCLI)



Models of Trilingual rCLI

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Phonological Permeability Hypothesis
(PPH: Cabrelli Amaro and Rothman, 2010)

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Phonological Permeability Hypothesis
(PPH: Cabrelli Amaro and Rothman, 2010)

- Phonological systems developed in childhood more stable than those developed in adulthood
- **rCLI from an L3 is more likely to impact the L2 than the L1**

Typological Similarity in CLI

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The overall similarity between a speaker's languages has been found to significantly impact **bilingual rCLI**

- Schmid and Köpke (2017)

Typological Similarity in CLI

The overall similarity between a speaker's languages has been found to significantly impact **bilingual rCLI**

- Schmid and Köpke (2017)

as well as **trilingual pCLI**

- Rothman (2010 et seq.), Westergaard et al. (2017)

Broad Research Questions

Does **typological similarity** play a role in rCLI from L3 to L1/L2?

Does **order of acquisition** play a role in rCLI from L3 to L1/L2?

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This project examines these questions in regards to **speech rhythm**

Speech Rhythm

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  - Syllable-timed (Spanish, French)
  - Stress-timed (English, German)

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Speech Rhythm

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Speech Rhythm

- Rhythm is the sense of movement in speech
  - Syllable-timed (Spanish, French)
  - Stress-timed (English, German)
- Adult learners are unlikely to develop an L2 rhythmic system that is comparable to that of a native speaker, **BUT...**
- They are able to develop an L2 rhythmic system which is distinct from the L1
  (Guilbault, 2002; Ordin & Polyanskaya, 2015)

Target Language Triad

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Target Language Triad

English

German

Spanish

Target Language Triad

English (Stress-timed)

German (Stress-timed)

Spanish (Syllable-timed)

Target Language Triad

English (Stress-timed)

German (Stress-timed)

Spanish (Syllable-timed)

Target Language Triad

English (Stress-timed)

German (Stress-timed)

Spanish (Syllable-timed)

Narrow Research Questions

Which language is more susceptible to rCLI from L3 Spanish?

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Which language is more susceptible to rCLI from L3 Spanish?

Does **similarity** play a role?

Narrow Research Questions

Which language is more susceptible to rCLI from L3 Spanish?

Does **similarity** play a role?

Does **order of acquisition** play a role?

Narrow Research Question

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- L1 English, L2 German, L3 Spanish

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- L1 English, L2 German, L3 Spanish
- L1 German, L2 English, L3 Spanish

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- L1 English, L2 German, L3 Spanish
- L1 German, L2 English, L3 Spanish
- L1 English, L2 German
- L1 German, L2 English

Narrow Research Question

- L1 English, L2 German, L3 Spanish
- L1 German, L2 English, L3 Spanish
- L1 English, L2 German
- L1 German, L2 English

Do linguistic similarity and/or order of acquisition influence the degree of rCLI to each language?

Participants

- 73 participants completed the study
- Inclusion requirements:
  - Sequential trilinguals with L2/L3 AoA > 5
  - Sufficient proficiency and fluency in all of the target languages
  - No knowledge of other non-target languages
- 20 participants met all requirements
  - 12 female, mean age $= 35$, age range $=$ 18-58

Participants

Language Background	Number of Participants
L1 English L2 German L3 Spanish	5
L1 German L2 English L3 Spanish	5
L1 English L2 German	6
L1 German L2 English	4

Procedure

Picture Narration Task

Procedure

Picture Narration Task

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- 4 images per language
- 5-20 minutes of speech per language

Analysis

- Data and materials are available at https://osf.io/pvmea/

Analysis

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- Recordings annotated in TextGrids via Praat (Boersma & Weenink, 2009)
- Duration of all vowels and consonants marked
- $\approx$ 1 minute of recorded speech annotated per participant per language

Speech Rhythm Measurements

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$$\%V = \frac{\text{sum of all vocalic interval durations}}{\text{total duration of vocalic and consonantal intervals}} \times 100$$

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Best for non-native speech analysis **between speakers of the same language** (White & Mattys, 2007)

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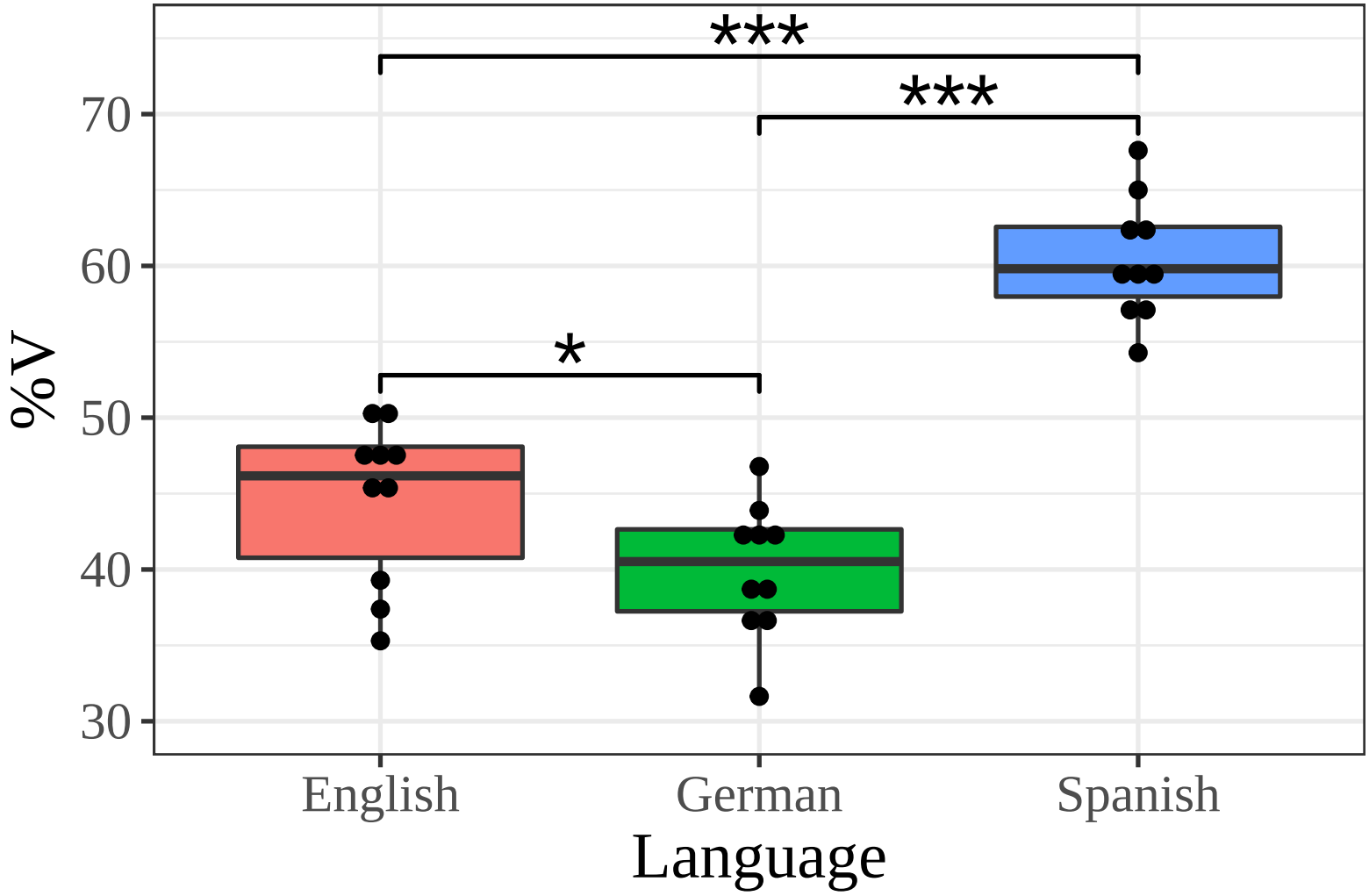
Results

L3 Spanish %V

Results

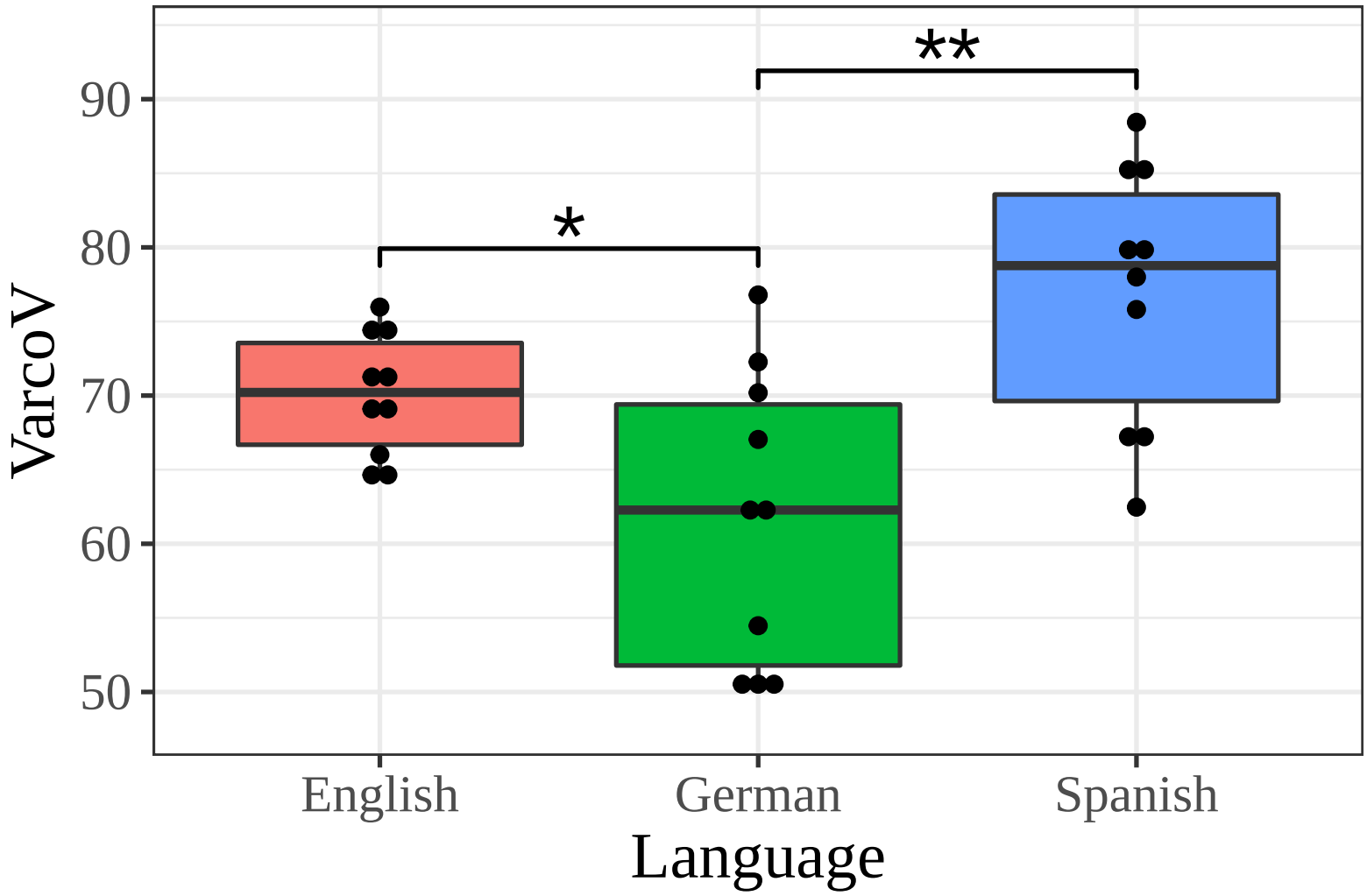
L3 Spanish %V



%V in L3 Spanish

Results

L3 Spanish VarcoV



VarcoV in L3 Spanish

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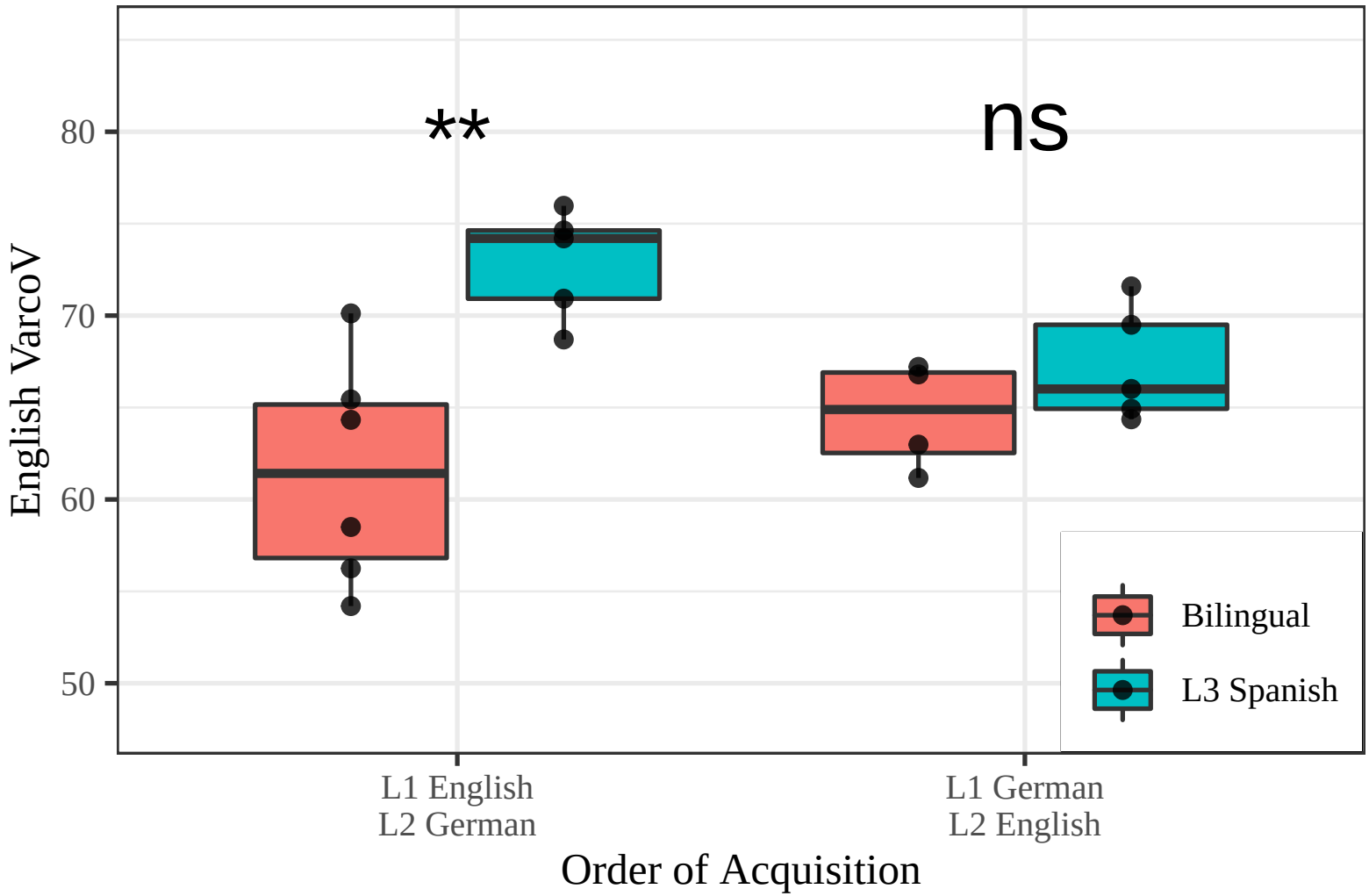
Regressive CLI

English VarcoV

Regressive CLI

English VarcoV



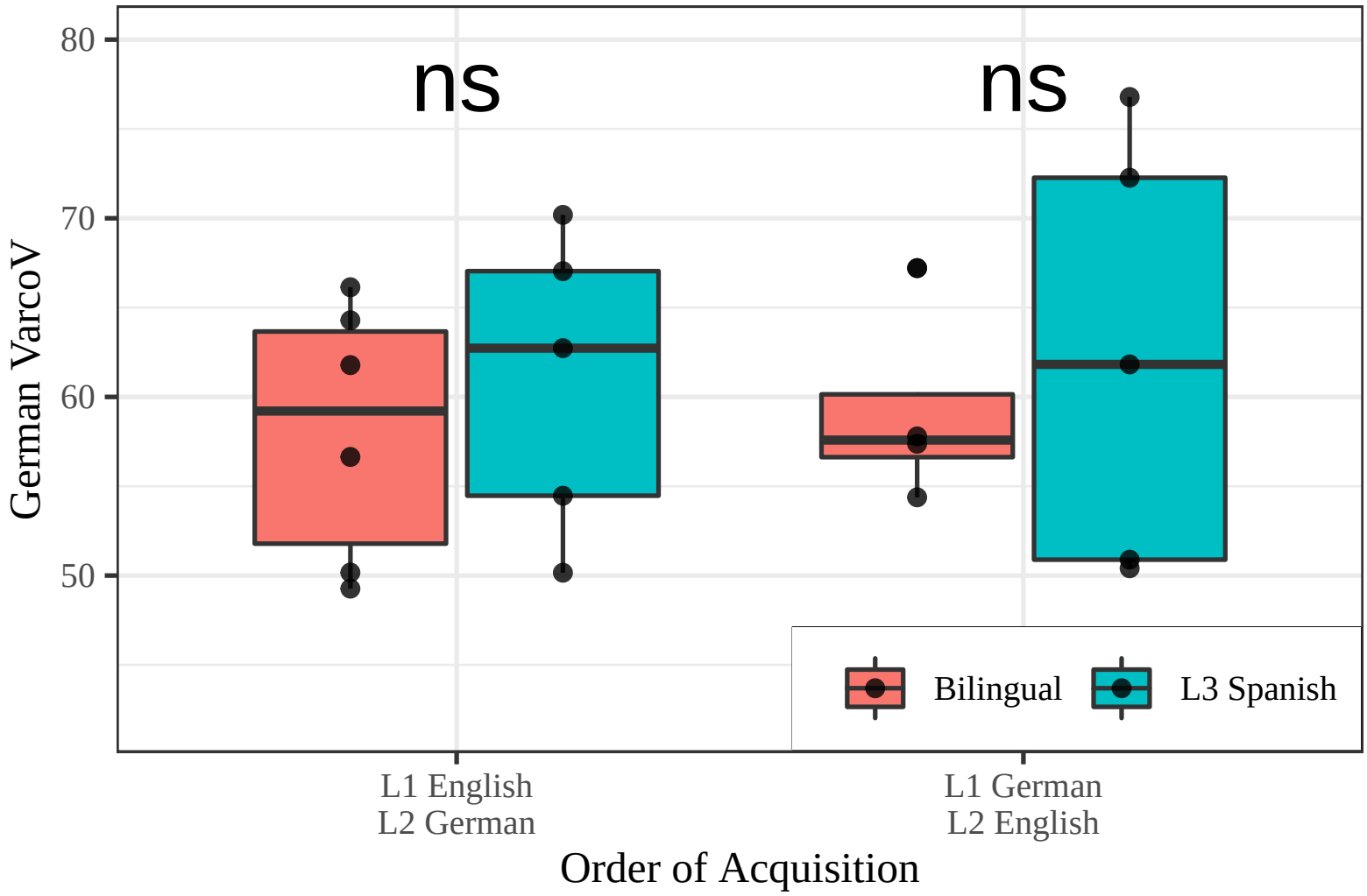
English VarcoV Values

Regressive CLI

German VarcoV

Regressive CLI

German VarcoV



German VarcoV Values

Discussion

Typological Similarity

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Discussion

Typological Similarity

- Trilinguals had a higher VarcoV in **English** than bilinguals, suggesting rCLI from L3
- German does not show this trend
- English is more **similar** to Spanish than German is to Spanish
- English rhythm is shifting to become more like Spanish rhythm

Discussion

Order of Acquisition

- This rCLI effect was found in L1 English but not L2 English

Discussion

Order of Acquisition

- This rCLI effect was found in L1 English but not L2 English
- This conflicts with the predictions of PPH

Similarity Convergence Hypothesis (SCH)

Discussion

SCH

Similarity Convergence Hypothesis (SCH)

All other things being equal, the greater the typological similarity between an earlier-acquired language and a later-acquired language in the multilingual repertoire, the more likely it becomes for rCLI to occur at the phonological level, resulting in the earlier-acquired language converging with (i.e., becoming more similar to) the later-acquired language.

Conclusions

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- This influence was more pronounced in cases where English was the speaker's L1

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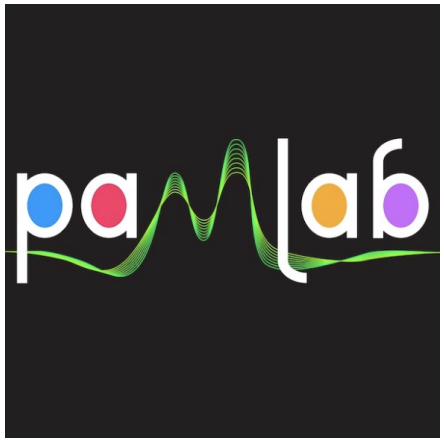
- This influence was more pronounced in cases where English was the speaker's L1
- Similarity Convergence Hypothesis (SCH)
- Next Steps
  - Typology vs. psychotypology
  - Consideration of other phonological features
  - The role of additional factors such as proficiency and frequency of use

Special Thanks



Jennifer Cabrelli

Kate Lindsey

Thank You!

These slides can be found at
https://www.meganmbrown.com

Questions?

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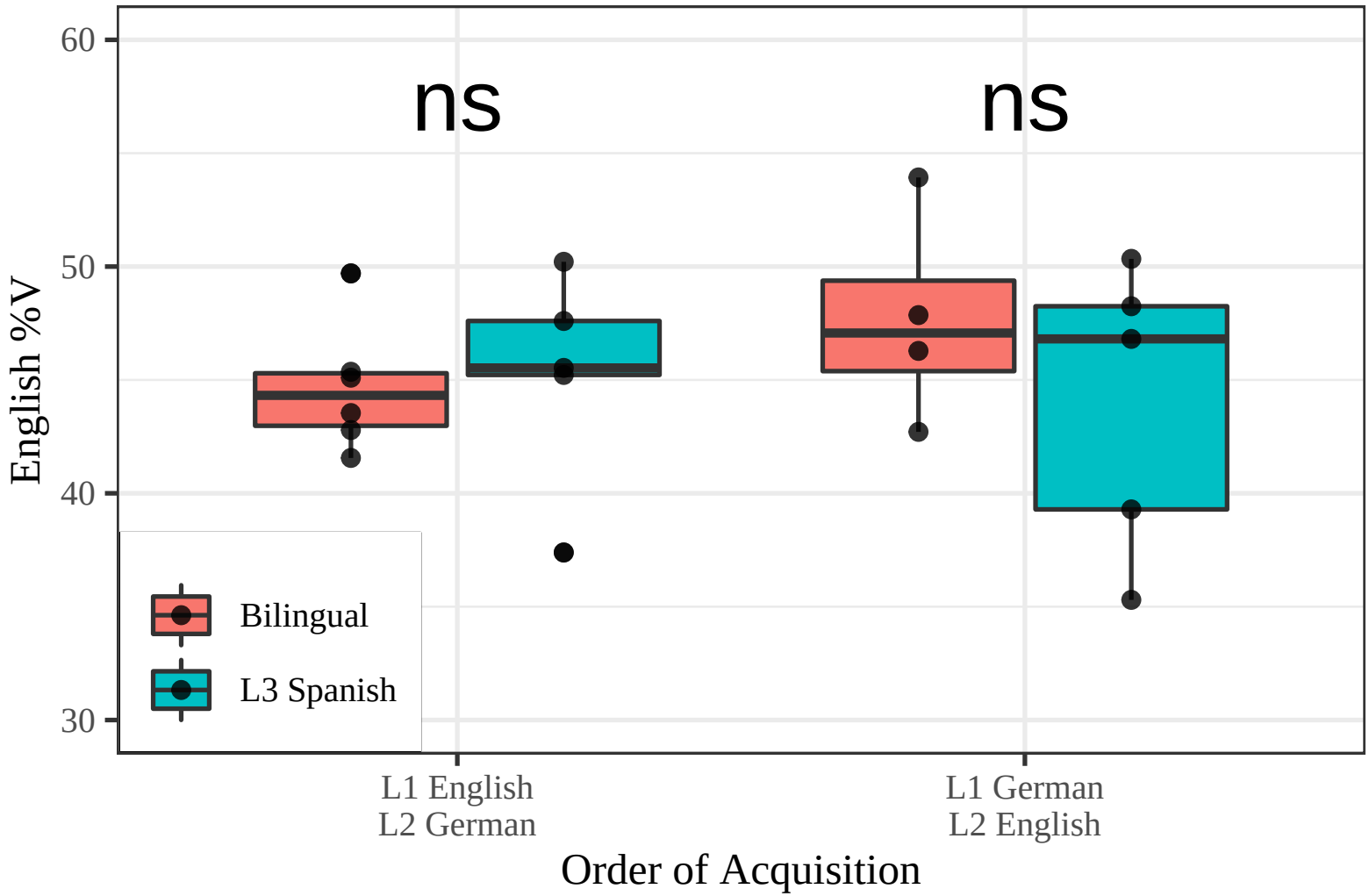
Additional Data

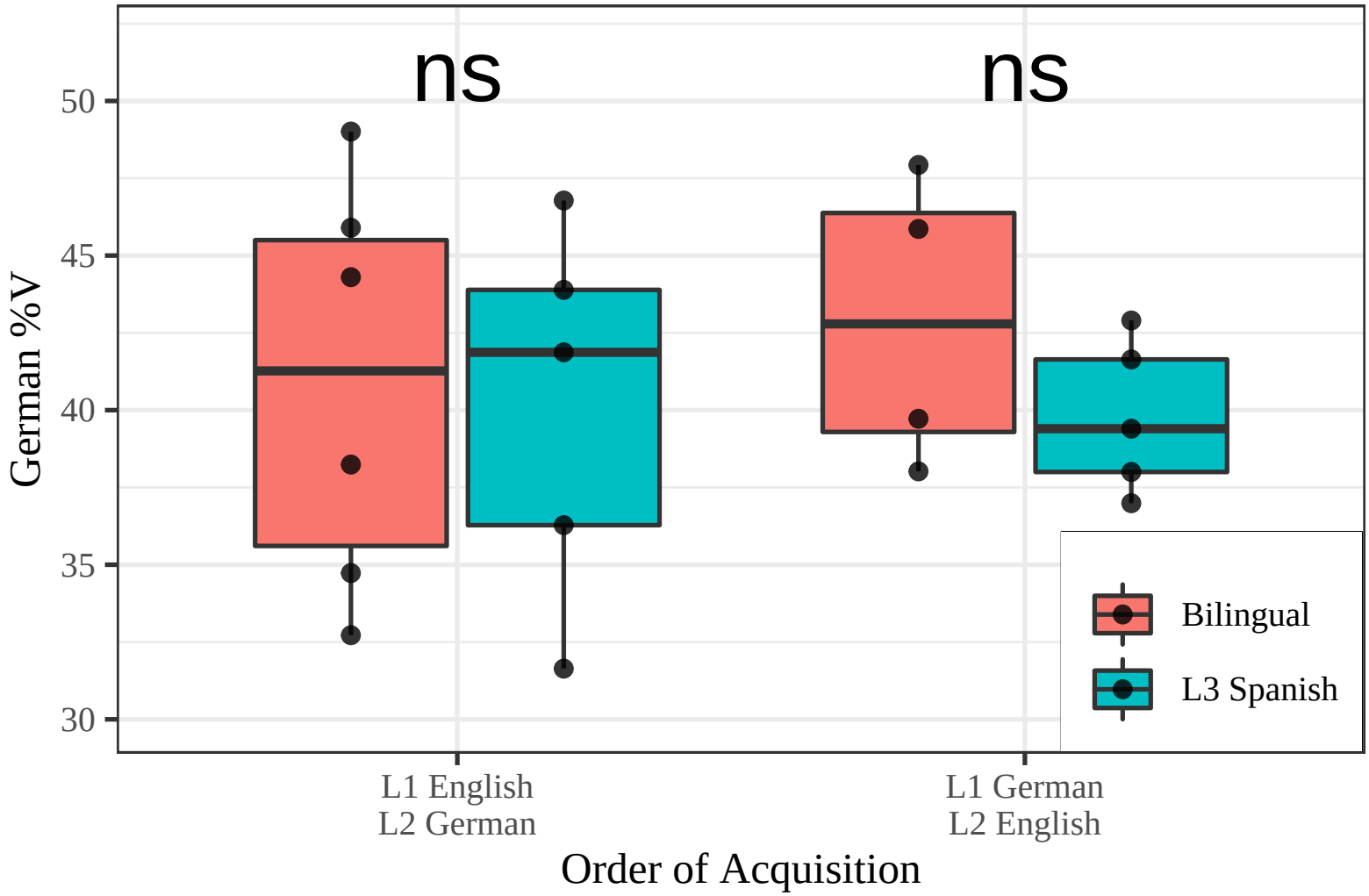
English %V



English %V Values

Additional Data

German %V



German %V Values