Sentential context impacts bilingual speech-in-speech recognition

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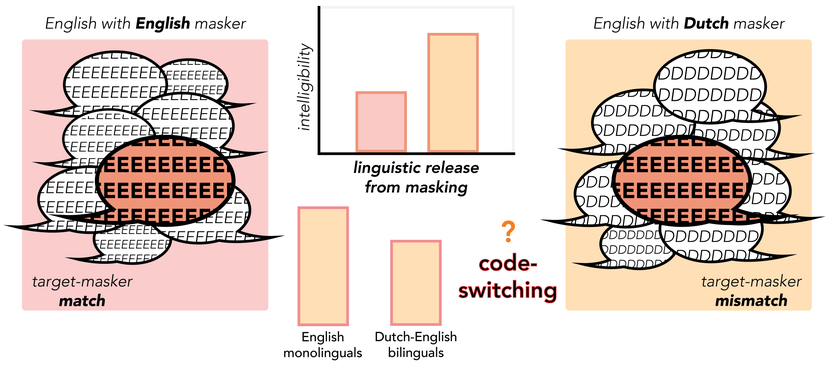
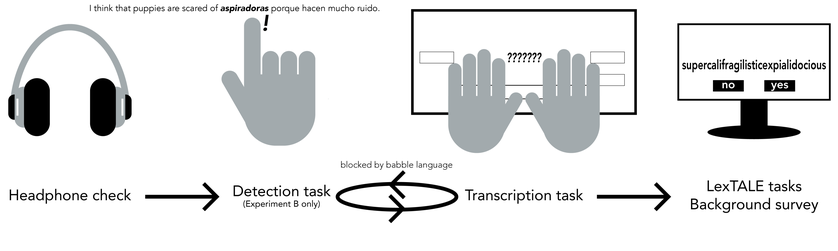
Research background



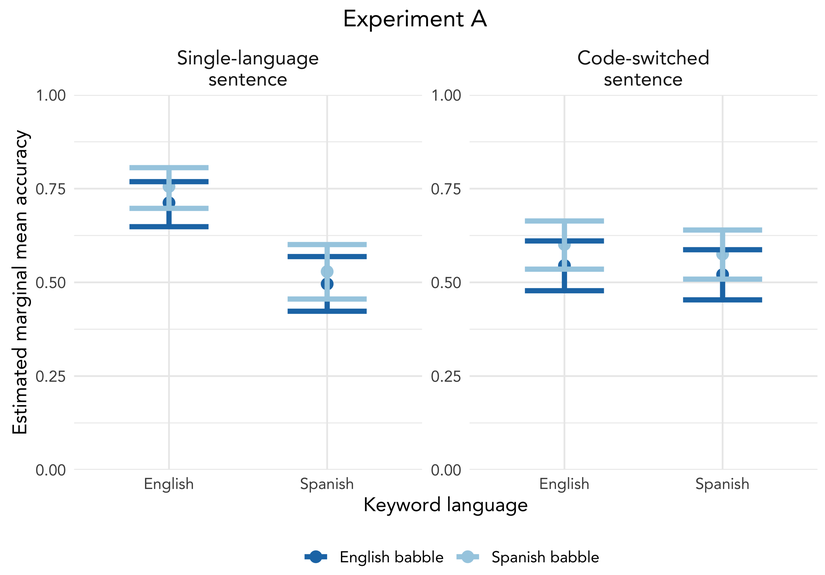
Participants

Procedure

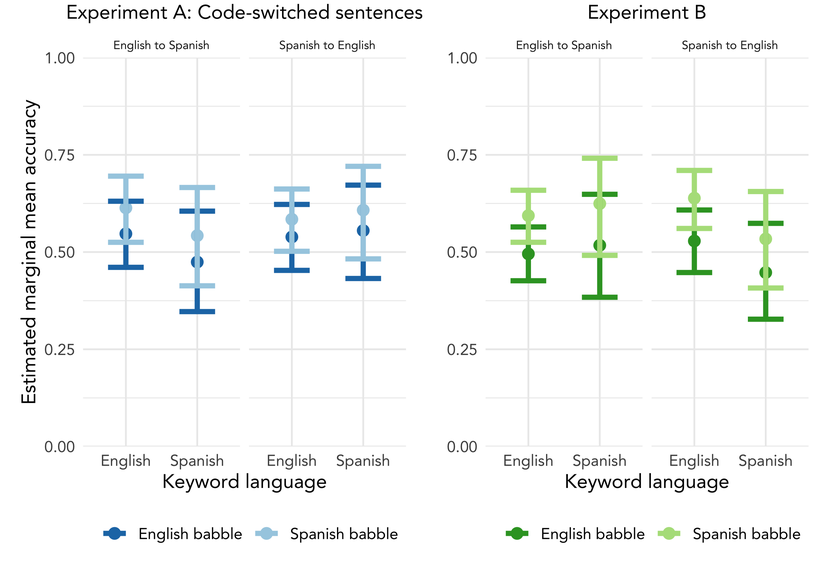


Analyses

Accuracy benefit for English versus Spanish decreases by ~20% in code-switched versus single-language sentences

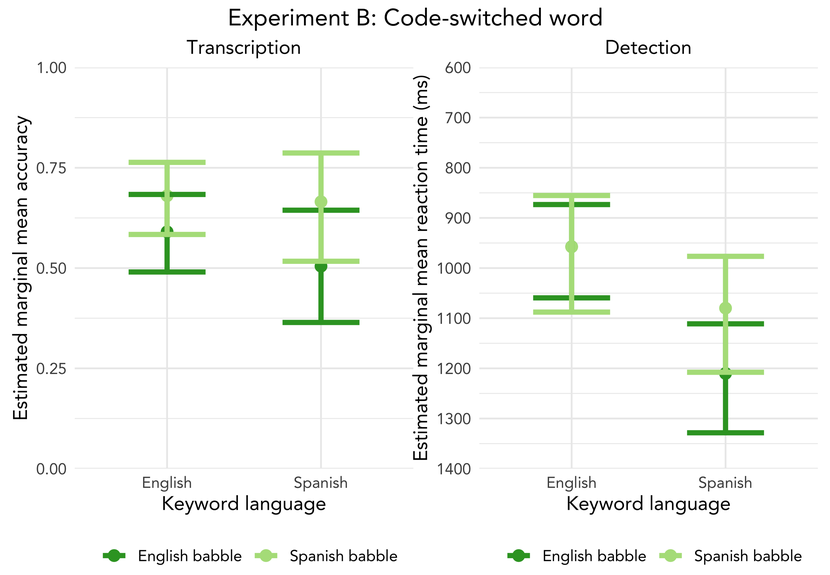


Removing single-language stimuli shifts transcription advantage from pre-switch keywords to post-switch keywords



Keyword accuracy (1,0) and reaction time data analyzed via linear mixed-effects models controlling for keyword position, language dominance (difference between English and Spanish LexTALE scores), and code-switching frequency (mean of L1-switch, L2-switch, and contextual switch responses on the bilingual switching questionnaire; see Rodriguez-Fornells et al., 2012)

Code-switched Spanish words are more susceptible to masker language than code-switched English words



Stimulus examples

Experiment		Sentence type	English critical word	Spanish critical word
A		Single-language	I *think* that *puppies* are *scared* of *vacuums* because they are *loud*.	*Creo* que los *cachorros* tienen *miedo* de las *aspiradoras* porque hacen mucho *ruido*.
	B	Code-switched	*Creo* que los *cachorros* tienen *miedo* de los ***vacuums*** because they are *loud*.	I *think* that *puppies* are *scared* of ***aspiradoras*** porque hacen mucho *ruido*.

Result summary

Experiment	Analysis	Measure	Level	Context	Prediction	Observation
A	1	Transcription (accuracy)	Sentence	**Single-language** versus **Code-switch**	Incongruent Target-Masker benefit attenuated by code-switching	Target-Context interaction with Masker main
B	2-3			**Spanish-English** versus **English-Spanish** code-switches	Incongruent Target-Masker benefit	
	4		Word			Congruent Target-Masker benefit for Spanish
	5	Detection (RT)				

References and acknowledgements

Brouwer, S., Van Engen, K. J., Calandruccio, L., & Bradlow, A. R. (2012).
Fernandez, C. B., Litcofsky, K. A., & Van Hell, J. G. (2019).
Lecumberri, M. L. G., Cooke, M., & Cutler, A. (2010).
Rodriguez-Fornells, A., Krämer, U. M., Lorenzo-Seva, U., Festman, J., & Münte, T. F. (2012).
Viswanathan, N., Kokkinakis, K., & Williams, B. T. (2018).

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