

Background

Background

- Bilinguals are often slower than monolinguals to retrieve words even when naming in the native and dominant language (e.g., Ivanova & Costa, 2008). This implies that **knowing a second language (L2) comes at a cost** to lexical retrieval speed, the origin of which is not well understood.
- However, **translation equivalents** facilitate picture naming (Costa et al., 1999) and reduce tip-of-the-tongue experiences (Gollan & Acenas, 2004).

Research Questions

Does knowing a word in the L2 help or hinder retrieval of a picture's name in the L1? Does the effect of knowing the L2 word depend on lexical frequency?

Predictions

- Lexical-level interference account** (e.g., Lee & Williams, 2001): Interference occurs in the L1 only when the L2 translation is known
L2-known L1 words slower than L2-unknown L1 words, esp. for low-frequency words
- Frequency-lag account** (e.g., Gollan et al., 2008): Lower levels of language use result in weaker connections to a word's phonology
No difference between L2-known and L2-unknown words

Methods

Participants

- 42 native speakers of Brazilian Portuguese with varying levels of English (L2) proficiency
- Late L2 learners: Began learning English in adolescence or adulthood
- Short-term immersion: Residing in New York City for 4.4 months on average at time of testing
- Mean age: 26.1 (range 18-37)

Picture Naming Task in Portuguese (L1)

- 140 black-and-white line drawings (IPNP database)
- 25% of the words were cognates in Portuguese and English
- Response times (RTs) recorded using a voice-triggered microphone.
- Lexical frequencies from Corpus Brasileiro (Sardinha, 2009)

English Vocabulary Knowledge Test (L2)

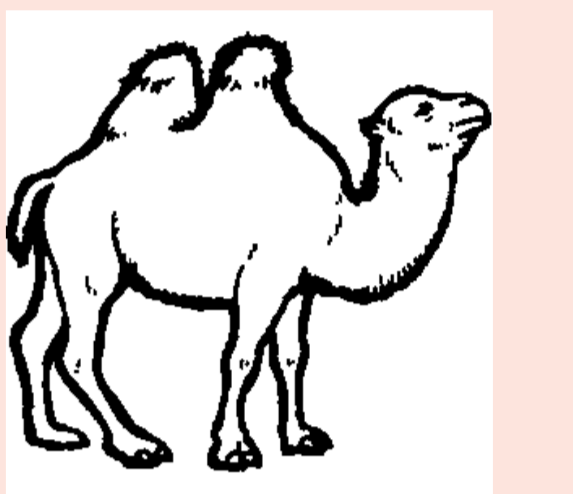
- Same 140 pictures as Portuguese naming task to assess which pictures named in L1 were known in L2

L2 Proficiency

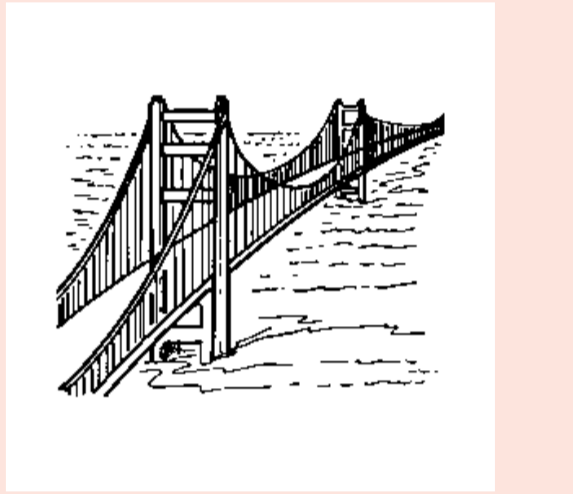
| | Minimum | Maximum | Mean | SD |
|------------------------------------|---------|---------|-------|-------|
| Composite of 4 measures | -2.14 | 1.18 | 0 | .85 |
| Self-rating (mean of 6 skills) 1-7 | 1.83 | 5.67 | 4.44 | 0.80 |
| Can-Do Questionnaire (mean) 1-5 | 1.72 | 4.61 | 3.57 | 0.72 |
| Vocabulary (140 items) | 21.4% | 75.4% | 50.1% | 13.5% |
| MTELP (45 items) | 33.3% | 97.8% | 73.9% | 17.3% |

| Lexical frequency characteristics | |
|-----------------------------------|--------|
| Median | 4343 |
| SD | 55933 |
| Minimum | 47 |
| Maximum | 407036 |

Low-frequency example



High-frequency example



Results

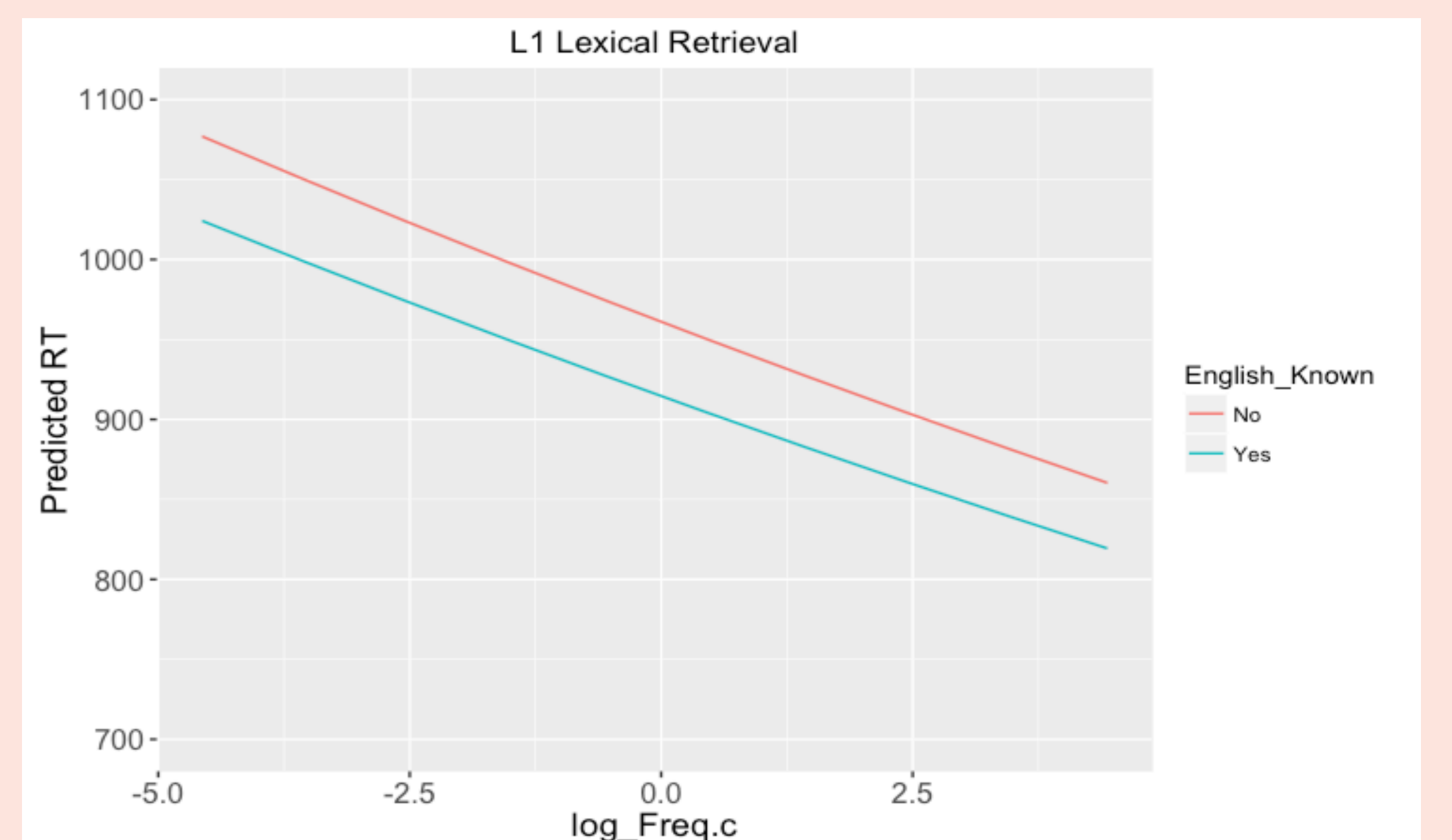
Model parameters

Mixed-effects model with crossed random effects

| Parameter (log scale) | Estimate | CI (Bootstrapped) | p-value (approximate df) |
|-------------------------------|----------|-------------------|--------------------------|
| Intercept | 6.87 | 6.81 : 6.92 | p < .001 |
| Log Frequency (centered) | -.03 | -.05 : -.01 | p = .001 |
| English Known | -.05 | -.08 : -.02 | p < .001 |
| L2 Proficiency | .02 | -.03 : .08 | p = .35 |
| Log Frequency * English Known | .00 | -.01 : .02 | p = .78 |

No cognate effect was found (when measured either dichotomously or continuously), so cognate status was not included in the model.

L1 Naming Latencies



Predicted means from the mixed-effects model

Summary & Conclusions

- L2-known words were retrieved faster than L2-unknown words.** This was independent of the word's lexical frequency and the participant's L2 proficiency.
- These findings support the idea that knowing the L2 label for a concept does not slow down retrieval to the L1 label due to competition, but rather that the L2 word knowledge facilitates L1 word retrieval.
- This is consistent with TOT data from Gollan & Acenas (2004) in which bilinguals experienced fewer TOTs for words that they knew in both language compared to words they knew in only one languages.
- Neither the lexical-level interference account nor the frequency-lag account predicted this pattern of findings. Perhaps knowing the L2 word changes the resting activation of their L1 counterparts.
- The participants were unbalanced, L1-dominant bilinguals immersed in an L2 environment. The participants tested in Gollan & Acenas (2004) and in Costa et al. (1999) were highly proficiency early bilinguals. Thus, we have shown that knowledge of L2 translation equivalents is facilitatory for speed of L1 retrieval even for less proficient bilinguals.

References & Acknowledgments

- Costa, A., Miozzo, M., & Caramazza, A. (1999). Lexical Selection in Bilinguals: Do Words in the Bilingual's Two Lexicons Compete for Selection? *Journal of Memory and Language*, 41, 365-397.
- Gollan, T. H., & Acenas, L.-A. R. (2004). What Is a TOT? Cognate and Translation Effects on Tip-of-the-Tongue States in Spanish-English and Tagalog-English Bilinguals. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 30(1), 246-269.
- Gollan, T. H., Montoya, R. I., Cera, C., & Sandoval, T. C. (2008). More use almost always means a smaller frequency effect: Aging, bilingualism, and the weaker links hypothesis. *Journal of Memory and Language*, 58(3), 787-814.
- Ivanova, I., & Costa, A. (2008). Does bilingualism hamper lexical access in speech production? *Acta Psychologica*, 127(2), 277-288.
- Lee, M.-W., & Williams, J. N. (2001). Lexical access in spoken word production by bilinguals: evidence from the semantic competitor priming paradigm. *Bilingualism: Language and Cognition*, 4(03).
- Sardinha, T. B. (2009). The Brazilian corpus: A one-billion word online resource. *Proceedings of the Corpus Linguistics Conference 2009*.

We thank Georgia Caldart and Jesiel Soares Silva for help with data collection and translation of materials, Loraine Obler for mentorship and feedback on the design, Gary Chant for technical assistance, and members of the Neurolinguistics Lab at the CUNY Graduate Center and the Bilingualism, Mind, and Brain Lab at UCR for helpful input. This study was supported by a Doctoral Student Research Grant from the CUNY Graduate Center.

Contact: evhighby@gmail.com