

Introduction

Word retrieval in bilinguals & facilitation

- In order to produce language, an individual must **retrieve** specific words from their lexicon.
- When a bilingual wants to express a certain concept, words that are tied to that concept get **activated** in the mind in both languages simultaneously (Bailey, Lockary, & Higby, under review).
- This **co-activation** makes words in both languages more readily accessible. This may **facilitate** word retrieval in both languages (Higby et al., 2020), resulting in faster word recall.

Interference & inhibition

- Cross-language co-activation can also sometimes produce **interference**.
- When a bilingual uses their non-dominant language, words in the dominant language are activated more strongly than words in the non-dominant language.
- To make words in the non-dominant language more accessible, the dominant language is **inhibited** when it is not in use (Green et. al., 1998).
- Dominant-language inhibition not only operates for specific words, but also involves suppression of all words across a language (Higby, Vasquez-Rocha, & Kroll, 2019).

Unified model

- Higby et al. (2020) proposed a model that incorporates both facilitation and interference. According to this model, cross-language facilitation always occurs whereas interference only occurs in certain linguistic contexts.
- Different time scales proposed: Facilitation has a long-term effect while interference is short-lived.

Current study

- This study examines the nature and duration of facilitation and interference effects in bilingual speech production by analyzing the time it takes bilingual participants to retrieve words from memory in both of their languages.

Research Questions & Hypotheses

- Does retrieving a word in the non-dominant language make its translation in the dominant language easier or harder to retrieve and if so, how long do these effects last?
- Are the effects of cross-language interference transient or do they continue after 30 minutes or a day?

Hypothesis: We tested Higby et al. (2020)'s model predictions that facilitation is a long-term effect and interference is a short-term effect. We hypothesized that participants will experience short-term interference effects and longer-lasting facilitation effects as the result of completing a series of picture-naming tasks in Spanish and English.

Participants

Language History Questionnaire (LHQ)

Participants reported on exposure to, use of, and self-rated proficiency in English, Spanish and other languages across their lifetime and given varying linguistic contexts and demands.

Spanish-English Bilinguals	
N	37
Gender	32f; 5m
Age (mean, SD)	25.6 yrs (8.1)
English Proficiency (mean, SD)	9.1 (1.5)
Spanish Proficiency (mean, SD)	8.2 (0.9)

Note: Proficiency was rated on a likert scale of 1-10. A score of 10 correlates to "native-like" proficiency.

Age Language was Learned	Spanish	English
By 5 years	32	23
By 10 years	2	8
By 15 years	2	4

Note: 1 data point is missing for Spanish and 2 data points are missing for English

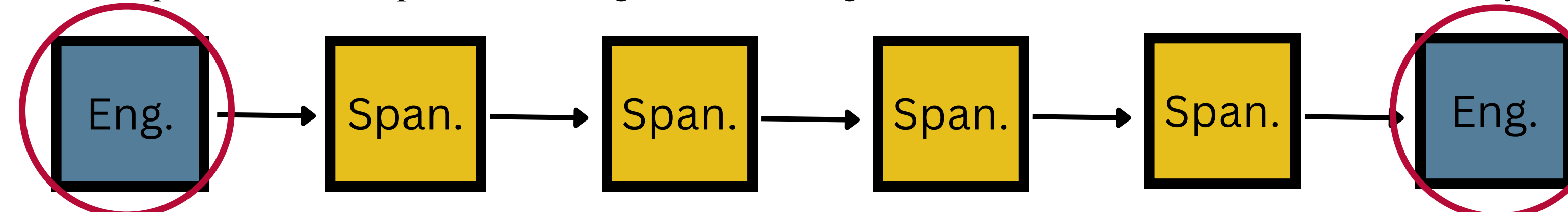
Methods

- Participants completed a series of picture-naming tasks in English and Spanish across two testing sessions, one day apart.
- Two experiments were incorporated into these two sessions in order to test three specific hypotheses.
- Fifty different pictures were named in each block.
- Half of the pictures were repeated across all blocks in an experiment and half were named in only one of the two languages.

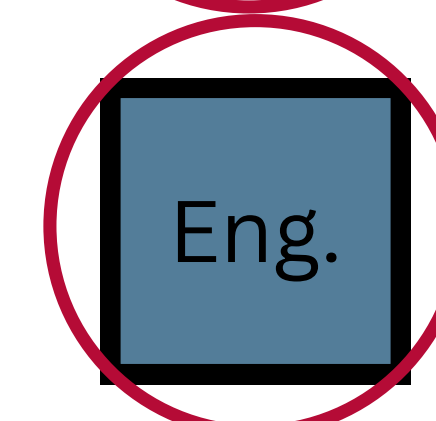
Experiment 1

- Participants completed 6 blocks of picture naming. The first block was named in English and served as a baseline. The following 4 blocks were named in Spanish in order to strongly activate the Spanish picture labels. The final block was named in English in order to observe the effect of previous Spanish naming on English naming speed and accuracy. When participants returned the next day, they completed one block of naming in English using the same set of images they named in English on day 1.
- Hypotheses:
 - Naming speeds will be slower in block 6 than block 1 of day 1 due to cross-language interference.
 - Naming speeds will be faster on day 2 than block 6 of day 1 due to the interference effect dissipating over night.
 - Naming speeds will be faster on day 2 than block 1 of day 1 due to long-term cross-language facilitation.
 - Pictures that were repeated in both Spanish and English will show greater interference than those that were only named in English.

Day 1



Day 2

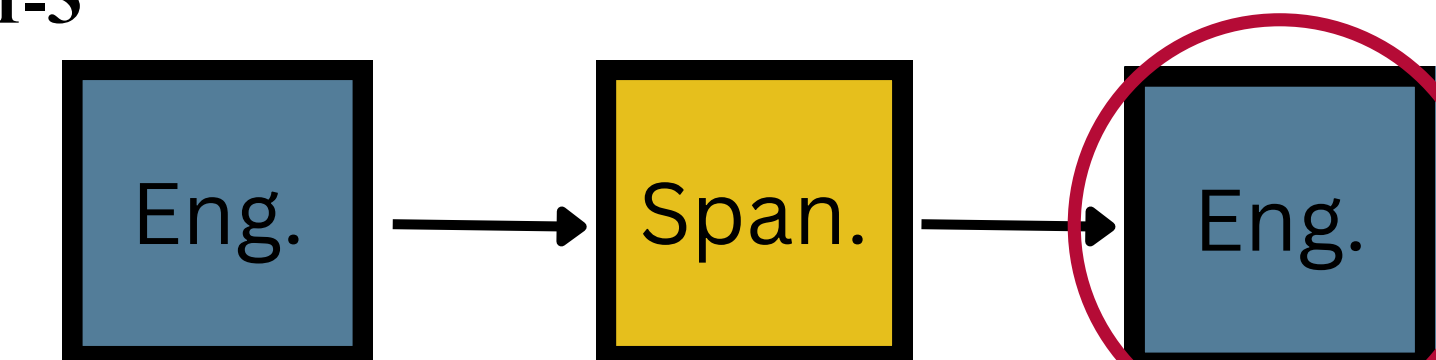


The critical comparison for Experiment 1 on Day 1 is between block 1 and block 6 (circled), while on Day 2 the comparison is between the last block from day 1 and the single block from Day 2.

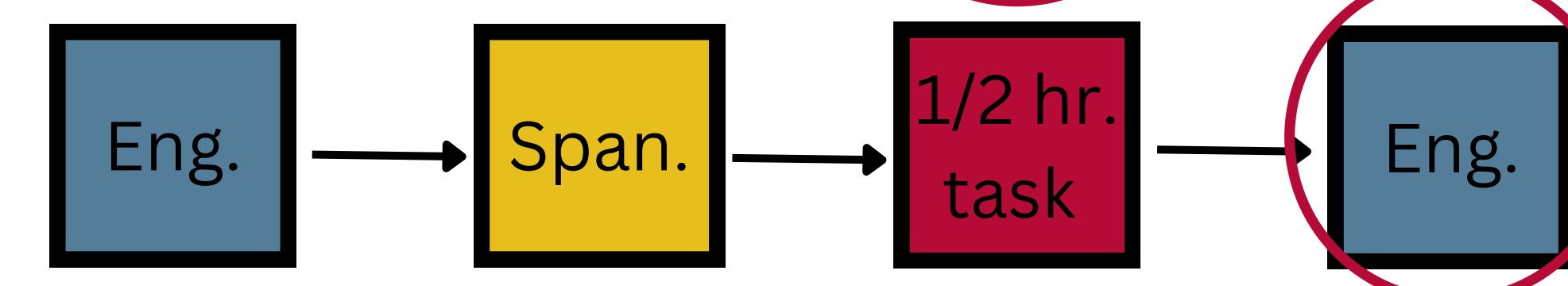
Experiment 2

- On Day 2, participants completed 6 additional naming blocks. Blocks 1-3 served as baseline, and blocks 4-6 served as the experimental condition.
- The 1st, 2nd and 3rd blocks were named in English, Spanish and English, respectively with new pictures. Participants did not take breaks longer than 5 minutes during or between naming blocks.
- The 4th, 5th and 6th blocks were named in English, Spanish and English, respectively, with another new set of pictures. Between the 5th and 6th blocks, participants completed a 30-minute non-linguistic number-letter task to test whether cross-language interference dissipated during this interval.
- Hypotheses: Naming speeds will be slower for block 3 compared to block 1 due to cross-language interference. However, naming speeds will be faster for block 6 compared to block 3 due to some dissipation of the interference effect over the 30-minute interval.

Blocks 1-3



Blocks 4-6



The critical comparison for Experiment 2 is between block 3 and block 6 (circled).

Current Status and Future Plans

All data from 37 participants have been collected and transcription of the audio files is complete. The research team is currently in the Error Coding phase. Once complete, the team will begin Data Analysis.

References & Acknowledgments

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- Higby, E., Donnelly, S., Yoon, J., & Obler, L. K. (2020). The effect of second-language vocabulary on word retrieval in the native language. *Bilingualism: Language and Cognition*, 23(4), 812-824.

• **Funding:** CSUEB Faculty Support Grants to E. Higby, CSUEB Center for Student Research (CSR)

• **CSR Scholarship Recipients:** Hannah Evans, Angela Montes, Monserrat Xitlali Padilla, Ashley Tinajero Gomez

• **Data collection & analysis help:** Thanks to Kate Lockary, Jennifer Truong, Joselin Soto, Loren Flores, Yaneli Aguilar, and Rebecca Verhoek