

The effect of heritage bilinguals' attitudes on the perception of code-switching

When producing a sentence, bilinguals are able to use one or both of their languages [6]. Studies of single word processing [3] have suggested that intrasentential code-switching (when both languages are used in an utterance) may be difficult for bilingual listeners to perceive relative to single-language speech. However, such work has not accounted for individual variation in attitudes towards the use of code-switching (e.g., positive or negative), which could affect their ability to perceive their languages, especially in more difficult contexts.

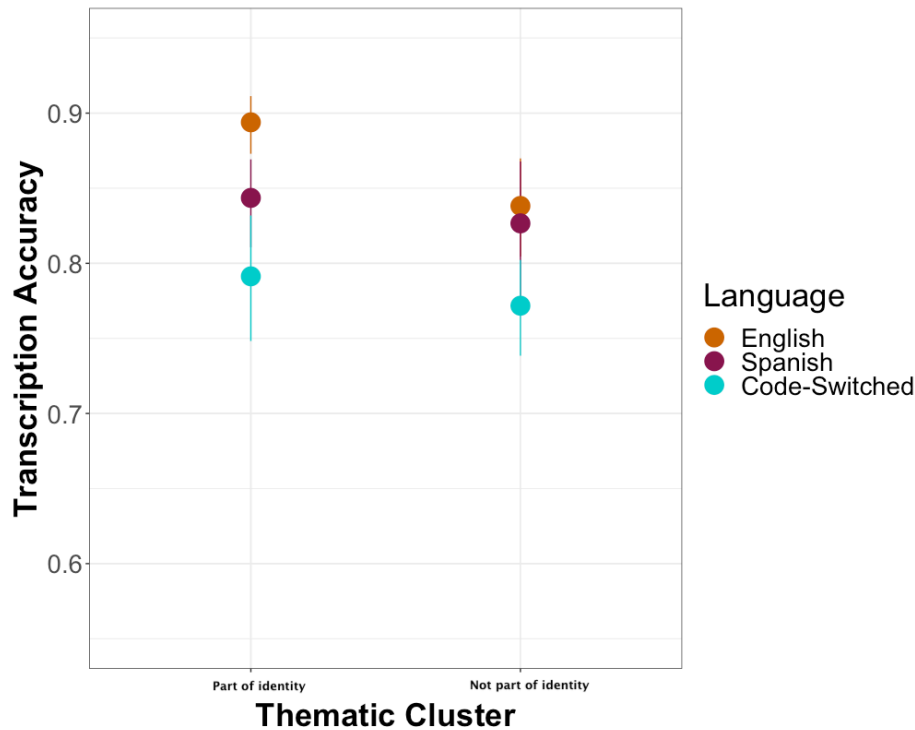
Heritage language bilinguals — L1 speakers of a minority language that they have cultural ties to (e.g., Spanish in the U.S.), but, because of societal reasons, have become dominant in the majority language (e.g., English in the U.S. [5]) — exhibit significant variation in attitudes, offer a unique window into how these impact language processing. This study investigates how Mexican-American Spanish-English heritage bilinguals' attitudes impacts perception of a code-switched versus single language speech. Fifty-four Mexican-American Spanish heritage bilinguals transcribed sentences in noise in English, Spanish, and code-switched blocks. They then responded the question: "Do you consider code-switching to be an important part of your identity? Why or why not?"

Main effects: code-switching, language: Participants were better at perceiving speech in single language blocks than code-switched blocks (Logistic mixed effect regression on proportion words correctly transcribed; $\beta = 0.006$, $p < 0.01$). Within single language blocks, participants were better at perceiving their dominant language (i.e., English) than their non-dominant language (i.e., Spanish; $\beta = -0.42$, $p < 0.05$), replicating previous work [2, 3].

Main effects are modulated by attitudes towards code-switching: A thematic analysis of the open ended question showed that participants either identified code-switching as part of their identity ($N=32$) or not as part of their identity ($N=21$). Extending the regression to include this group distinction, along with a control for English vs. Spanish proficiency, revealed that individuals who considered code-switching part of their identity had significantly higher transcription accuracy than those who did not consider it part of their identity ($\beta = -0.35$, $p < 0.05$). As seen in Figure 1, this effect was driven by higher transcription accuracy in English-only blocks for participants that did vs. did not consider code-switching part of their identity. In contrast, participants in both groups performed similarly in Spanish-only and code-switched blocks.

Conclusions: Overall, results show that intra-sentential code-switched speech is more difficult to process than speech from single-language sentences, replicating previous work in the visual modality [1]. This suggests that code-switching increases co-activation and, consequently, competition between both languages, negatively impacting bilingual language processing. Additionally, incorporation of heritage bilinguals' attitudes in the analysis shows that individual differences can modulate language processing, showcasing the importance of taking the heterogeneity of language attitudes into account when studying bilingual listeners. We speculate that increased accuracy in English arises because their positive attitudes towards code-switching increases their use of code-switching. This increases their ability to manage interference from co-activation of their first language while learning their second language [4], enabling higher performance in English.

Figure 1: Transcription accuracy for blocks, with participants separated by thematic cluster. The x-axis represents the thematic coding cluster from the analysis of the open-ended question about attitudes, while the y-axis represents the average by word accuracy in transcription (wings show bootstrapped 95% confidence intervals).



References

- [1] Altarriba, J., Kroll, J., Sholl, A., & Rayner, K. (1996). The influence of lexical and conceptual constraints on reading mixed-language sentences: Evidence from eye-fixation and naming times. *Memory & Cognition*, 24, 477-492.
- [2] Blasingame, M., & Bradlow, A. R. (2020). Early versus extended exposure in speech perception learning: Evidence from switched-dominance bilinguals. *Languages*, 5(4), 39.
- [3] García, P. B., Leibold, L., Buss, E., Calandruccio, L., & Rodriguez, B. (2018). Code-switching in highly proficient Spanish/English bilingual adults: Impact on masked word recognition. *Journal of Speech, Language, and Hearing Research*, 61(9), 2353-2363.
- [4] Marian, V., & Spivey, M. (2003). Competing activation in bilingual language processing: Within-and between-language competition. *Bilingualism: Language and Cognition*, 6(2), 97-115.
- [5] Montrul, S. (2016). *The acquisition of heritage languages*. Cambridge University Press.
- [6] Poplack, S. (1980). Sometimes I start a sentence in Spanish Y TERMINO EN ESPAÑOL: Toward a typology of code-switching. *Linguistics*, 18(7-8), 581-618.