

Bilingualism, Auditory Distraction and Verbal Memory

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Introduction

- The Cocktail Party Effect —being distracted from a conversation when you hear understandable speech in the background— is common. How does it manifest itself for bilingual individuals?
- Cocktail Effect for bilinguals —French speakers (bilingual in Italian) are less distracted when asked to detect French words embedded within an audio clip presented in French (in their first language) than in their less known language (Gautreau et al. 2013).
- Hearing recognizable speech hinders performance during reading comprehension and memory tasks (e.g., Beaman et al., 2014; Hanczakowski et al., 2017; Hyona & Ekholm, 2016; Marsh et al., 2008).
- Bilinguals are more resistant to distraction given their ability to process and inhibit use of both languages (e.g., Bialystok et al., 2012; Olguin et al., 2019).



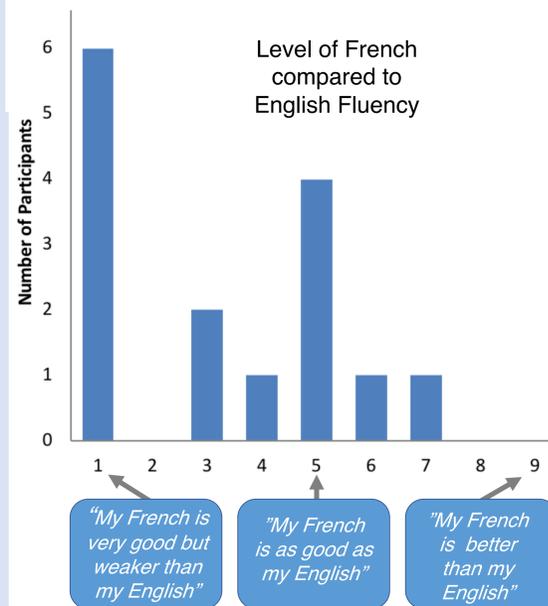
Question

- Does French-English bilinguals' ability to memorize words in one language (or the other) differ based on whether they hear background speech in the same or different language than the words to be memorized? For example, when trying to learn English words, does hearing English speech distract more than French?

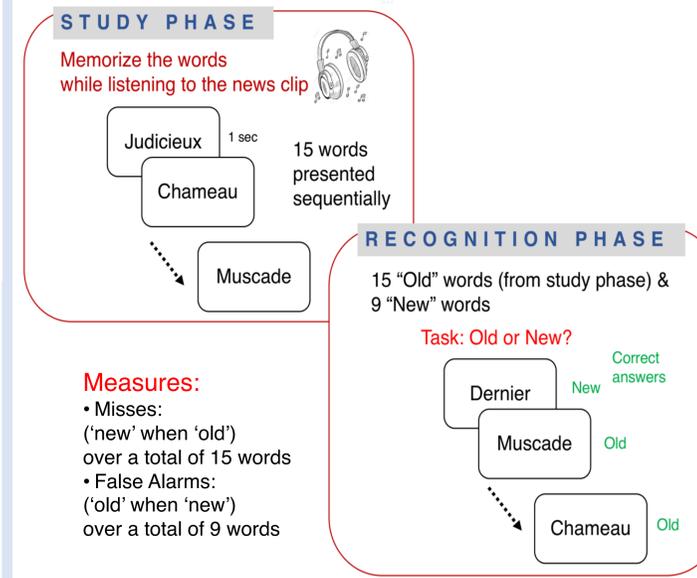
Method

Participants

- 15 fully English-French bilingual participants → have been consistently speaking English and French for the last 8 years in a home, school or work environment (as in Janic et al. 2021)
- Mean age: 24 years old (range 18 to 42)



Word Recognition Memory Task



Measures:

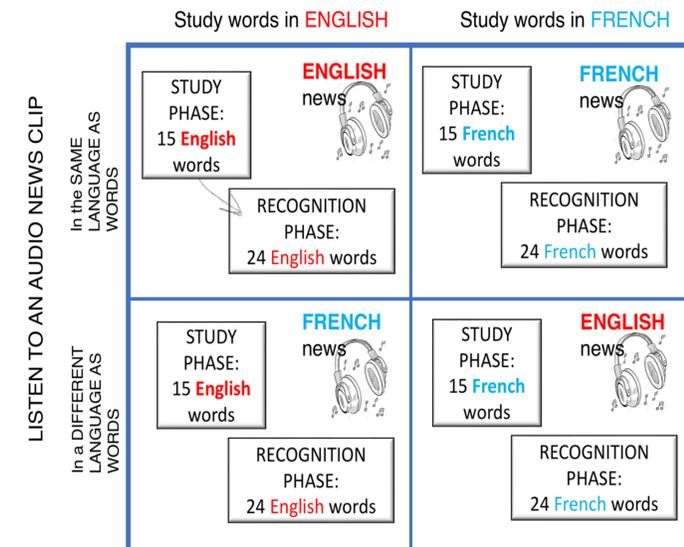
- Misses: ('new' when 'old') over a total of 15 words
- False Alarms: ('old' when 'new') over a total of 9 words

Controls:

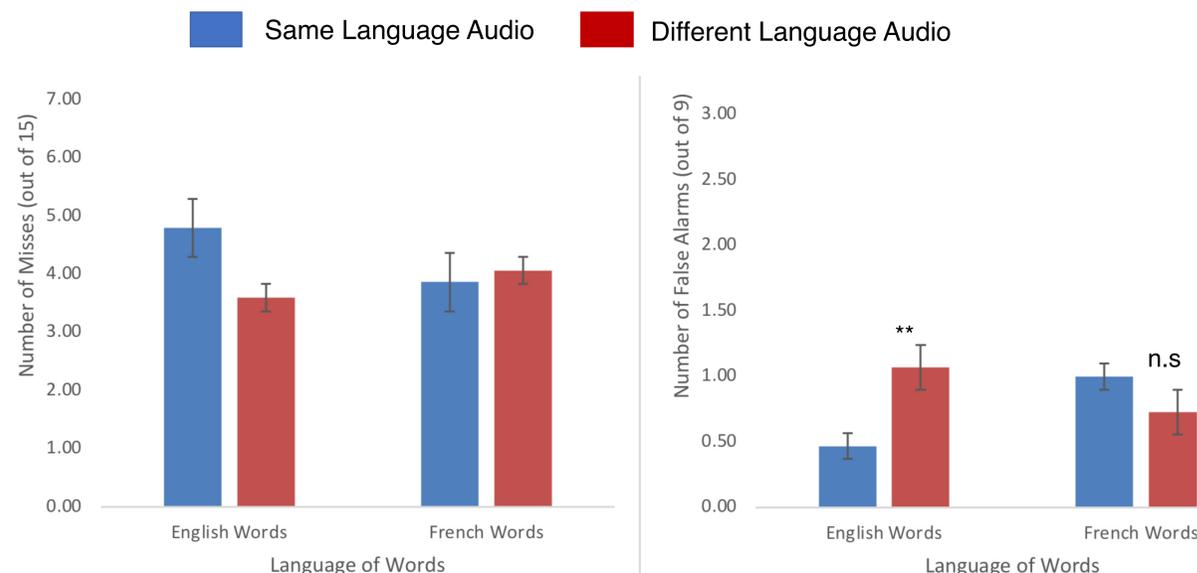
- Order of the conditions are counterbalanced across participants
- All words are presented in a random order for each participant
- Participants never exposed to the same words
- All words and all news clips are in all four conditions
- All news clips have the same voice

repeated in

FOUR conditions



Results



- No significant difference for the number of misses across all conditions.
- When learning English words, the average number of false alarms is significantly larger when hearing French news clips (M: 1.07, SD: 1.03) than English ones (M: 0.47, SD: 0.83) [t(14)=2.36, p=0.02].
- Whereas when learning French words, the average number of false alarms is not different when hearing French or English news clips (M: 1, SD: 1.07, and M: 0.73, SD: 1.1, respectively) [t(14)=0.74, p=0.23].

Conclusions & Discussion

- Bilinguals recognized a similar number of learned English and French words whether they studied them while hearing background in the same or different language. Bilingual's verbal recognition seems to be resistant to background speech.
- However, bilinguals reported recognizing more unlearned English words while hearing background in French.
- This was not the case when recognizing unlearned French words.
- Since most participants know French less than English, these results suggest that hearing a less known language may interfere with your capacity to correctly recognize learned information in a better known language. Interestingly, participants's learning of French words was not susceptible to the language background.
- These results must be interpreted with caution; comparing different levels of bilingualism must be done in the future.

Bibliography

- Beaman, C. P., Hanczakowski, M., & Jones, D. M. (2014). The effects of distraction on metacognition and metacognition on distraction: Evidence from recognition memory. *Frontiers in Psychology*, 5(MAY), 439–439. <https://doi.org/10.3389/fpsyg.2014.00439>
- Bialystok, E., Craik, F. I. ., & Luk, G. (2012). Bilingualism: Consequences for mind and brain. *Trends in Cognitive Sciences*, 16(4), 240–250. <https://doi.org/10.1016/j.tics.2012.03.001>
- Gautreau, A., Hoen, M. & Meunier, F. (2013). Intelligibility at a multilingual cocktail party: Effect of concurrent language knowledge. *Proceedings of the Annual Conference of the International Speech Communication Association, INTERSPEECH*. 2077-2080.
- Hanczakowski, M., Beaman, C. P., & Jones, D. M. (2017). When distraction benefits memory through semantic similarity. *Journal of Memory and Language*, 94, 61–74. <https://doi.org/10.1016/j.jml.2016.11.005>
- Hyönä, J., & Ekholm, M. (2016). Background speech effects on sentence processing during reading: An eye movement study. *PloS One*, 11(3), e0152133–e0152133. <https://doi.org/10.1371/journal.pone.0152133>
- Janic, A., Cavanagh, P. & Rivest, J. Effect of bilingualism on visual tracking attention and resistance to distraction. *Sci Rep* 10, 14263 (2020). <https://doi.org/10.1038/s41598-020-71185-6>
- Marsh, J. E., Hughes, R. W., & Jones, D. M. (2008). Auditory distraction in semantic memory: A process-based approach. *Journal of Memory and Language*, 58(3), 682–700. <https://doi.org/10.1016/j.jml.2007.05.002>
- Olguin, A., Cekic, M., Bekinschtein, T. A., Katsos, N., & Bozic, M. (2019). Bilingualism and language similarity modify the neural mechanisms of selective attention. *Scientific Reports*, 9(1), 8204–8204. <https://doi.org/10.1038/s41598-019-44782-3>
- Cabrera, E. (2021). DRSP and the Cocktail Party Effect. Retrieved April 4th 2021 from <https://blog.cabrera-research.org/cpe>