

LANGUAGE RESEARCH LABORATORY

http://web.mac.com/languageresearch

Examining talker effects in bilingual listeners' perception of spoken words

Maura L. Wilson¹, Conor T. McLennan¹, and Julio González²

¹Cleveland State University

²University Jaume I of Castellón, Spain

ABSTRACT

Previous studies demonstrate that listeners are faster to recognize words recently spoken by the same talker relative to a different talker. However, such talker effects may be more robust when processing is relatively slow. The purpose of the current study is to examine talker effects in bilingual listeners as a function of whether the listeners are hearing words in their first (L1) or second (L2) language. More specifically, in the present study, conducted in Spanish, we examined whether talker changes affected bilinguals differently, depending on whether Spanish was their L1 (Spanish-English bilinguals) or their L2 (English-Spanish bilinguals). Given that bilinguals typically process their L2 more slowly than their L1, the results are expected to reveal greater talker effects in English-Spanish than Spanish-English bilinguals. The current study should provide a greater understanding of the role that talker variability plays in bilingual listeners' online perception of spoken words.

INTRODUCTION

•Despite numerous sources of variability (e.g., talker identity, speaking rate), humans recognize spoken words both *quickly and accurately*.

•Talker information does *not* comprise part of the linguistic content of an utterance.

– For example, the word “house” should be accessed in our mental lexicon regardless of who says the word.

•Nevertheless, talker variability has long-term consequences for the *representations* underlying language perception (see e.g., Church & Schacter, 1994; Goldinger, 1996).

•Listeners typically process words they heard recently more quickly than words they have not heard recently (referred to as a *priming effect*).

•Talker changes can cause spoken word recognition to be relatively slow and can reduce the magnitude of the priming effect (referred to as a *talker effect*).

•Talker effects may emerge relatively late during processing (McLennan & Luce, 2005).

•Bilinguals are expected to process words in their second language (L2) more slowly than in their first language (L1) (see e.g., Ransdell & Fischler, 1987).

•Since all auditory stimuli were presented in Spanish, processing is expected to be relatively slow in L2 (English-Spanish bilinguals) listeners compared to L1 (Spanish-English bilinguals) listeners.

•Therefore, greater talker effects are expected in L2 listeners.

METHOD

Long-Term Repetition Priming Paradigm

•Two blocks of spoken stimuli presented to listeners:

Prime Block → (filler task) → *Target Block*

•Prior to experiment, all participants read an article written in Spanish to activate their Spanish language mode (Grosjean, 1998).

•After a brief practice phase, two blocks of auditory stimuli were presented to listeners:

Stimuli

•Primes and targets varied in talker identity:
– Half the stimuli in each block were spoken by a male and half by a female

•Primes and targets varied in lexical status:
– Half the stimuli in each block were real words in Spanish and half were nonwords

Lexical Decision Task

•Participants were instructed to press one button to respond “word” and another button to respond “nonword” as quickly and accurately as possible.

•Reaction times (RTs) to make lexical decisions to words in the *target block* were measured as a function of *prime type*.

– RTs were measured from the onset of the word to the onset of the participants' button response.

Design: Three Conditions

MATCH: Primes and targets spoken by same talker
boca (male) → boca (male)
boca (female) → boca (female)

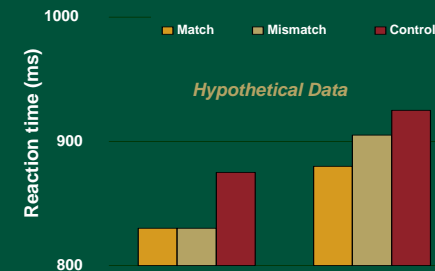
MISMATCH: Primes and targets spoken by different talkers
boca (female) → boca (male)
boca (male) → boca (female)

CONTROL: Primes and targets differ completely
casa → boca

Predicted Results

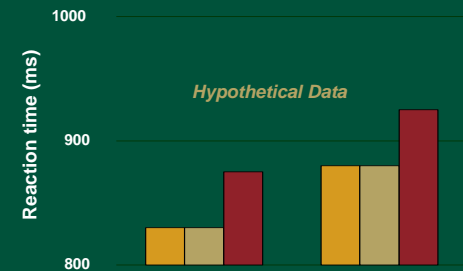
Time course predictions:

•No talker effects in L1 (relatively fast processing)
•Robust talker effects in L2 (relatively slow processing)



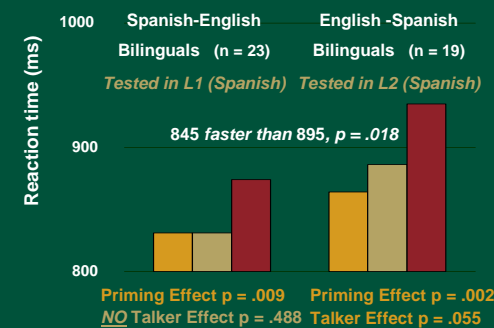
Alternative predictions:

•Both abstract and talker-specific properties will take longer to process in L2
•No talker effects in L1 OR L2



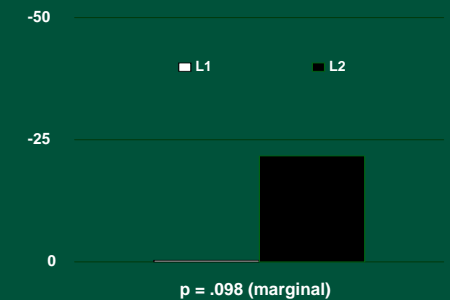
Obtained Results

(Tentative - Data collection ongoing)



Magnitude of Talker Specificity

• We directly compared the role that talker-specific details played in bilingual listeners' perception of Spanish words by analyzing *the difference between the match and mismatch conditions* as a function of whether Spanish was the L1 or L2.



Conclusions

- Previous studies manipulated speed of processing
 - delayed shadowing, hard lexical decision
- In the current study, the talker effects obtained in the English-Spanish listeners are presumably due to somewhat slower processing in bilinguals' L2
 - consistent with time course predictions
- Other populations in which spoken language is typically processed more slowly might also be affected more by talker variability
 - Older adults
 - Hearing impaired listeners
 - Listeners with other types of communication disorders
 - Listening to dysarthric speech (Mattys & Liss, 2008)

References

Church, B.A. & Schacter, D.L. (1994). Perceptual specificity of auditory priming: Implicit memory for voice intonation and fundamental frequency. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20, 521-533.

Goldinger, S.D. (1996). Words and voices: Episodic traces in spoken word identification and recognition memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 22, 1166-1183.

Grosjean, F. (1998). Studying bilinguals: Methodological and conceptual issues. *Bilingualism: Language and Cognition*, 1, 131-149.

Mattys, S.L. & Liss, J.M. (2008). On building models of spoken word recognition: When there is as much to learn from natural “oddities” as artificial normality. *Perception & Psychophysics*, 70, 1235-1242.

McLennan, C.T. & Luce, P.A. (2005). Examining the time course of indexical specificity effects in spoken word recognition. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 31, 306-321.

Ransdell, S.E. & Fischler, I. (1987) Memory in a monolingual mode: When are bilinguals at a disadvantage? *Journal of Memory and Language*, 26, 392-405.

This research was supported in part by research grant number 5 R03 DC 007316-4 from the National Institutes on Deafness and Other Communication Disorders, National Institutes of Health (to CM) and by Proyecto PSI2009-10067 (Spain) (to JG). Thanks to Teresa Markis, Jessica Newell, Andriy Palychuk, and several other Research Assistants for their assistance on this project.