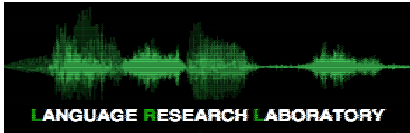


Examining the consequences of talker variability in the perception of native and foreign-accented speech

Bronder, E.*, SITO, A.*, McLennan, C.T.*, Gonzalez, J.†

*Language Research Laboratory, Department of Psychology, Cleveland State University; †University Castellón, Spain



ABSTRACT

We previously examined talker effects in spoken word recognition by examining the circumstances under which variability in speaking rate affects participants' perception of spoken words. The word recognition and memory literatures are now replete with demonstrations that variability has representational and processing consequences. Our research focuses on one of the conditions expected to influence the extent to which variability plays a role in spoken word recognition, namely time-course of processing. Based on previous work, we hypothesized that speaking rate variability would only affect later stages of spoken word recognition. Our results confirmed this hypothesis: Talker effects were only obtained when processing was relatively slow. However, our previous stimuli not only differed in speaking rate, but also in articulation style (i.e., casual and careful). Therefore, in the current set of experiments, we sought to determine whether we would obtain the same pattern of results with foreign-accented stimuli that only differed in talker identity (i.e., male versus female). Moreover, to further generalize our time-course findings, the stimuli were produced by a different speaker than the speaker in our earlier study. The results add to our knowledge of the circumstances under which variability affects the 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 variability has long-term consequences for the *representations* underlying language perception (see e.g., Church & Schacter, 1994; Goldinger, 1996).

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

•For example, regardless of whether one articulates the word *telephone* carefully or casually, it does not change the meaning of the word.

•Talker information is typically more variable and less frequent than more abstract linguistic information.

Time-course hypothesis

•Talker specificity effects should be observed when processing is *slow* but not when processing is *fast*.

•Foreign-accented speech is more difficult to process than native-accented speech (Munro & Derwing, 1995).

•Specificity effects refer to a reduction in the long-term repetition priming effect.

•Past work provides evidence for the time-course hypothesis (McLennan & Luce, 2005).

McLennan & Luce, 2005

METHOD

Paradigm: Long-Term Repetition Priming

•Two blocks of spoken stimuli were presented to listeners:

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

•Reaction times (RTs) to make lexical decisions to *targets* were measured as a function of *prime* type.

Stimuli

•Primes and targets varied in talker identity:

- Female speaker
- Male speaker

•Half (12) the stimuli in each block were real words and half were nonwords.

Task

•Hard Lexical Decision

- Word-like nonwords (e.g., *bacov*)
- Discrimination between words and nonwords is hard
- Processing should be relatively *slow*

Design: Three Conditions

MATCH: Primes and targets are the same talker
 bacon (male) → bacon (male)
 bacon (female) → bacon (female)

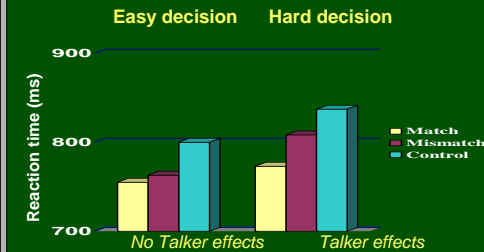
MISMATCH: Primes and targets are different talkers
 bacon (male) → bacon (female)
 bacon (female) → bacon (male)

CONTROL: Primes and targets differ completely
 folder → bacon

McLennan & Luce, 2005

•Talker effects associated with changes in *articulation style* were observed in the hard discrimination lexical decision task but not in the easy discrimination lexical decision task.

•Processing was relatively *slow* when the discrimination between words and nonwords was hard and relatively *fast* when the discrimination was easy.



Current Study

•We sought to determine whether we would obtain greater talker effects with foreign-accented stimuli.

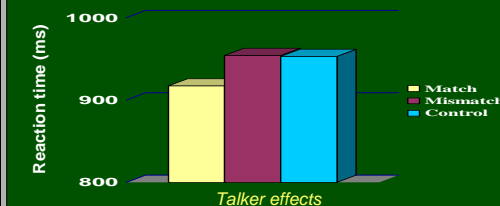
Experiment 1

•English stimuli produced by native speakers of Castilian Spanish.

•Experiment conducted in Cleveland, Ohio with native speakers of American English.

•Prediction: More robust talker effects in foreign-accented speech due to relatively slow processing.

English Words with Spanish Accent



• We directly compared foreign-accented and native-accented speech.

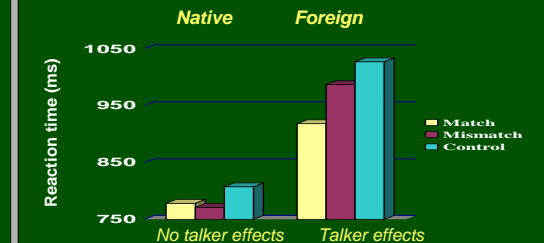
Experiment 2

• Native-accented speech: Spanish stimuli produced by native speakers of Castilian Spanish.

• Foreign-accented speech: Spanish stimuli produced by native speakers of American English.

• Experiment conducted in Castellón, Spain with native speakers of Castilian Spanish.

• Predictions: 1) Foreign-accented speech should slow processing. 2) More robust talker effects in foreign-accented speech relative to native-accented speech.



Conclusions

• Foreign-accented speech slows processing which further enables talker effects

• Talker effects are evident with foreign-accented speech but not native-accented speech with both American English participants and Castilian Spanish participants

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, 3, 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, 5, 1166-1183.

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.

Munro, M.J. & Derwing, T.M. (1995). Processing Time, Accent, and Comprehensibility in the Perception of Native and Foreign-Accented Speech. *Language and Speech*, 38, 3, 289-306.

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