

Title: Effects of listener age, talker accent, and semantic context on lexical access

Authors: Rebecca E. Bieber\*#, Christian Brodbeck, Vera Yevsukov, and Samira Anderson

Affiliations: University of Maryland, College Park

## **Abstract**

Older listeners report an inordinate amount of difficulty in the perception of non-native speech. These reports are consistent with laboratory findings of reduced speech perception accuracy for speech produced by non-native talkers, especially for older listeners. Some stimulus-related variables are known to aid with perception of challenging speech. For example, sentence-level semantic context can restore behavioral recognition of speech stimuli that are acoustically degraded. However, electrophysiological (EEG) studies indicate that acoustic degradation can lead to reductions in the N400 effect, a neural marker of predictability, suggesting limited benefit from available context.

The literature to date has conflicting findings regarding older listeners' ability to benefit from semantic cues. EEG measures tend to suggest that older listeners are less able to take advantage of available semantic context to facilitate lexical access. On the contrary, behavioral studies in the auditory domain indicate that older listeners benefit as much or more than younger listeners from the presence of semantic context. However, many of these behavioral studies utilized degraded or challenging auditory stimuli, while the electrophysiological studies often included undistorted (and often visually presented) stimuli.

It is unclear how the effects of listener age and talker accent on processing might combine to influence benefit from semantic context. The presence of a non-native accent might further exacerbate the lack of context benefit for older listeners (resulting in an additive effect of age + signal degradation in reduced magnitude and delayed latency of the N400 effect). Alternatively, the presence of acoustic degradation might cause older listeners to rely more heavily on semantic information to facilitate lexical access (resulting in an elimination of the age effect in N400 latency and magnitude for non-native stimuli), perhaps reflecting the behavioral findings.

In the present study, younger and older normal-hearing listeners heard English sentences produced by native speakers of English and Spanish, containing target words differing in predictability. Listeners were asked to identify the target word from the sentence while 32-channel cortical responses were recorded. Effects of talker native language, target predictability, and listener age on identification accuracy, reaction time, and cortical responses were examined. Preliminary findings indicate a delayed N400 latency for non-native speech stimuli, but no effects of age or interactions of listener age and talker accent.

Acknowledgements of funding sources: This project was supported by the National Institute on Deafness and Other Communication Disorders of the National Institutes of Health under Award number R21DC015843 (Anderson). Funding was also provided by the University of Maryland MCM fund for Student Research Excellence (Bieber).

There are no conflicts of interest to report.

Poster only

Corresponding author contact: [rebecca.bieber@gmail.com](mailto:rebecca.bieber@gmail.com), [rbieber@umd.edu](mailto:rbieber@umd.edu), 1.301.405.7454