

Auditory N1 Amplitude Varies Across Multiple Acoustic and Phonological Dimensions in Speech

Olivia Pereira

Villanova University, Villanova, Pennsylvania, United States

Joe Toscano

Villanova University, Villanova, PA, United States

Abstract: Listeners are sensitive to numerous fine-grained acoustic cues in speech. However, there has been little work examining how listeners encode these cues at early stages of perception. The event-related potential (ERP) technique provides a tool to help us address this. Previous work shows that the amplitude of the auditory N1 ERP component varies with differences along VOT continua, but it is not clear which other cues show similar effects. We present data examining a large set of minimal pair stimuli spanning 18 consonants. Results reveal widespread differences in N1 amplitude for stops, fricatives, and nasals, including distinctions primarily caused by temporal cues (stop voicing; /b,d,g/ vs. /p,t,k/) and spectral cues (place of articulation; /b,p/ vs. /d,t/ vs. /g,k/). Our results suggest that early speech processing is based on fine-grained acoustic cues, rather than articulatory differences, and that the ERP technique provides a useful tool for measuring speech sound encoding.