

Cross-linguistic influence in vowel processing in multilinguals: an ERP study

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The aim of this study is to investigate phonetic perception mechanisms in multilingual participants, whose L1 is Polish, L2 is English, and L3/Ln is Norwegian. Additional factors taken into account will be the participants' language proficiency and dominance. We will employ the event-related brain potential (ERP) technique to compare bioelectrical brain activity in response to changes in a series of vowels produced in the three languages. Multilingual participants will be exposed to selected vowel contrasts in their L1, L2 and L3 presented within the oddball paradigm (i.e., a sequence of frequently occurring *standard* stimuli will be interrupted by the occasional appearance of *deviant* stimuli). Speech sounds will be played via earphones while participants will watch a muted movie without subtitles. Vowels from the three languages will be presented in separate experimental blocks. Apart from the EEG session, the participants will also complete L2 and L3/Ln proficiency tests, language history and use questionnaires as well as a gating task assessing speech-specific aptitude.

The ERP component which is expected to index the listeners' sensitivity to discriminable changes in the presented vowel series is the Mismatch Negativity (MMN). It is a negative-going wave deflection typically elicited by changes in auditory stimuli with a peak at around 150-250 milliseconds from change onset (Näätänen et al., 2007). Based on previous studies, we can hypothesize that the response to the change will be reduced for non-native languages as compared to L1 (Jakoby, Goldstein & Faust, 2011; Liang & Chen, 2022; Song & Iverson, 2018). However, the question about the differences between L2 and L3/Ln remains open due to the lack of previous research on this topic. The current study will be the first to investigate the neurophysiological markers of vowel perception in multilingual speakers. The results will allow a more in-depth understanding of pre-attentive speech perception processes. Furthermore, we will examine the relationship between the multilingual participants' profiles (i.e. language proficiency and dominance as well as speech-specific aptitude) and brain activity.

References:

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