

Second language speech processing in realistic environments: An electrophysiological investigation

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Everyday listening environments are far from optimal. Adverse conditions such as background noise are particularly detrimental to non-native listeners, and non-native accents can also be hard for native listeners to understand under noise. The present study investigated how native (L1) and non-native (L2) listeners modulate their speech processing in competing-talker background noise for L1- and L2-accented speech, using EEG (electroencephalography) measures of auditory and lexical processing (i.e., neural entrainment to the amplitude envelope of speech and N400, respectively). The results demonstrated that L1 listeners increased their degree of lexical processing (larger N400) when listening to the more difficult L2 accent than their own L1 accent, and they similarly had greater target-talker entrainment for the L2 accent. In contrast, L2 listeners showed a reduced N400 effect overall (i.e., smaller N400 difference between different predictability conditions), but they had greater target-speech entrainment than did native listeners, likely because their difficulty with L2 speech recognition caused them to focus more attention on the speech signal. It thus appears that the increased effort of L2 listeners, as well as L1 listeners understanding L2-accented speech, modulates their auditory and lexical processing during speech recognition. This may provide a mechanism to compensate for their perceptual challenges under adverse conditions.