The effects of nativeness and background noise on the perceptual learning of voices and ambiguous sounds

The speech signal is highly variable: listeners are exposed to multiple speakers, each having their own unique pronunciation. Moreover, communication often occurs in suboptimal conditions, e.g., due to the presence of background noise or because it is conducted in a non-native language. Despite variability in the speech signal, native listeners are usually able to quickly adapt to unfamiliar speakers by means of perceptual learning. In principle perceptual learning could be especially beneficial when listening conditions are adverse, however, it may potentially be impeded due to listeners having difficulties picking up the relevant acoustic, lexical or phonological information from the signal.

This thesis investigates the role of nativeness and background noise on the perceptual learning of ambiguous sounds and voices. The perceptual learning of ambiguous sounds was addressed in five experiments with native and non-native listeners who were exposed to an ambiguous sound with or without the presence of background noise. The results showed that both the native and non-native perceptual systems flexibly adapted in clean listening conditions, while learning was impeded for non-native listeners when background noise was present. The perceptual learning of voices was addressed in a large-scale learning study in which non-native listeners learned to recognize voices of unfamiliar speakers. The results revealed that non-native listeners are able to learn voices and benefit from voice familiarity in speech processing, but not in word recognition. Taken together, these results support a hybrid theory of lexical access, underlining the importance of both abstract and talker-specific information in speech comprehension.