

Pitch in native and non-native Lombard speech

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Lombard speech, speech produced in noise, is acoustically different from speech produced in quiet (e.g. higher Fundamental Frequency (F0), increase in amplitude, and decrease in spectral tilt) and has extensively been studied in natives (e.g. Summers et al. 1988). To investigate whether non-native Lombard speech is different from native Lombard speech we recorded 30 Dutch natives reading 144 sentences in Dutch and English and 9 American-English natives in English, in quiet and noise (hearing 83 dB SPL Speech-Shaped Noise). We additionally manipulated the location of focus in the sentence, having early and late focus sentences. Our analysis using linear mixed effect models indicates that the Dutch show an increase in F0 in both Dutch and English Lombard speech as compared to their speech produced in quiet. These results show that non-natives also produce Lombard speech. The American-English data are more complex, only showing a difference in F0 between speech produced in quiet and Lombard speech in sentences with late-focus, due to post-focal compression. These results suggest that pitch-changes in Lombard speech are more language specific than originally thought. Moreover, they suggest that acquiring a new language involves learning how pitch changes in that language's Lombard speech.