

R26: IMPACT ANALYSIS OF NATURALISTIC ENVIRONMENTAL NOISE TYPE ON SPEECH PRODUCTION FOR COCHLEAR IMPLANT USERS VERSUS NORMAL HEARING LISTENERS

Jaewook Lee¹, Hussnain Ali¹, Ali Ziaei¹, John H.L. Hansen¹, Emily A. Tobey²

¹Center for Robust Speech System, Department of Electrical Engineering, University of Texas at Dallas, Richardson, TX, USA

²School of Behavioral and Brain Sciences, The University of Texas at Dallas, Richardson, TX, USA

Lombard effect is the involuntary response speakers experience in the presence of environmental noise. This phenomenon is known to impact change in vocal effort including increased voice intensity, pitch period structure, formant characteristics, glottal spectral slope, speech rate, etc. for normal hearing (NH) listeners. However, little is known about Lombard effect on speech production for cochlear implant (CI) users, or if there is speech production changes between CI and NH individuals during 2-way conversations. The objective of this study has been to analyze the speech production of CI users with respect to environmental noise structure. In addition, the study aims to investigate the degree to which CI user's speech production is affected as compared to NH listeners. A total of 12 speakers (6 CI and 6 NH) participated by producing conversational speech in various everyday environments. Mobile personal audio recording devices from continuous single-session audio streams were collected and analyzed. Prior advancements in this domain include the "Prof-Life-Log" longitudinal study at UT-Dallas. A number of parameters that are sensitive to Lombard speech were measured from the speech. Preliminary analysis suggests that the presence of Lombard effect is shown in speech from CI users who are post-lingual deaf adults. Speakers increased their vocal effort, such as vowel intensity, fundamental frequency and glottal spectral slope significantly in challenging noisy environments to ensure intelligible communication. Results across several speech production parameters will be presented and compared for CI and NH subjects.

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