

Volume 152, Issue
4_Supplement
October 2022

Meeting abstract. No PDF available.

OCTOBER 01 2022

Characterization and normalization of second language speech intelligibility through lexical stress, speech rate, rhythm, and pauses ✓

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J. Acoust. Soc. Am. 152, A265 (2022)

<https://doi.org/10.1121/10.0016224>

Connected Content

A companion article has been published: [Using lexical stress, speech rate, rhythm, and pauses to characterize and normalize second language speech intelligibility](#)



While a range of measures based on speech production, language, and perception are possible (Manun *et al.*, 2020) for the prediction and estimation of speech intelligibility, what constitutes second language (L2) intelligibility remains under-defined. Prosodic and temporal features (i.e., stress, speech rate, rhythm, and pause placement) have been shown to impact listener perception (Kang *et al.*, 2020). Still, their relationship with highly intelligible speech is yet unclear. This study aimed to characterize L2 speech intelligibility. Acoustic analyses, including PRAAT and Python scripts, were conducted on 405 speech samples (30 s) from 102 L2 English speakers with a wide variety of backgrounds, proficiency levels, and intelligibility levels. The results indicate that highly intelligible speakers of English employ between 2 and 4 syllables per second and that higher or lower speeds are less intelligible. Silent pauses between 0.3 and 0.8 s were associated with the highest levels of intelligibility. Rhythm, measured by Δ syllable length of all content syllables, was marginally associated with intelligibility. Finally, lexical stress accuracy did not interfere substantially with intelligibility until less than 70% of the polysyllabic words were incorrect. These findings inform the fields of first and second language research as well as language education and pathology.

Topics

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