Impact of Socio-Economic Status on Speech Understanding in Noise

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Speech understanding difficulty in the presence of background noise is a common complaint when a patient is evaluated by an audiologist. Speech testing in quiet has been part of traditional protocol from the beginning of audiology. While this test may be reflective of difficulties experienced by some patients, many patients with a significant hearing loss will score at the ceiling of this test. Only more recently has speech in noise testing been emerging as part of typical audiometric evaluation protocol to address patient concerns for hearing in the presence of background noise. Previous research by Fitzgerald et al, 2019 and Smith, et al, 2024 revealed a more linear relationship between QuickSIN speech in noise evaluation and degree of high frequency hearing loss. These same patients showing deficits on QuickSIN speech in noise performance often exhibit excellent word recognition scores in quiet, even when they have significant high-frequency sensorineural hearing loss. A replication study at UH involving 500 patients (and counting) has confirmed this relationship. However, it only takes into account the age of the patient and severity of hearing loss. Socio-economic status (SES) is long known to affect patient outcomes in general and has not been considered in this replication study.

This new study evaluates the impact of SES on speech understanding in noise. SES will be quantified via the Area Deprivation Index (ADI), which is a validated measure of how disadvantaged a neighborhood is and reflects income, education, employment, and housing quality. Using a tool housed by University of Wisconsin-Madison, the summer intern will perform a retrospective review of potentially 1000 patients to obtain zip codes and cross-reference them with the UW-Madison database to obtain the ADI. Statistical analysis (multiple regression) will then determine the contributions of SES to patient performance. This project will advance the field's understanding of SES on patient performance and offers an opportunity to analyze a large dataset the size which is rarely seen in our field.

Individualized mentoring to the research fellow will be provided, which will include reviewing experimental design and journal articles. Most of the project will be done remotely. The goal will be to complete chart review in month one and submit for publication in month two.