

ABSTRACT

Relationship between acoustic measures and scaled intelligibility in Parkinson's disease:

A within – speaker approach

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Purpose: This study investigated potential acoustic variables associated with within-speaker variations in scaled sentence intelligibility in Parkinson's Disease (PD).

Method: Twelve participants with dysarthria in PD were studied. Controls were also included. Participants were audio-recorded producing 10 sentences. Speech rate, articulatory rate, fundamental frequency, sound pressure level and F2 Interquartile Range (F2 IQR) were obtained. Fifty listeners also scaled speech intelligibility for the 10 sentences. Group differences in acoustic measures were examined using ANOVA. For participants with PD, relationships between intelligibility estimates and acoustic measures were investigated using correlation analysis.

Results: The PD group tended to demonstrate a faster articulatory rate, reduced Mean F0, F2 IQR and SPL variation, slightly lower Mean SPL, greater F0 variation and range compared to controls. Articulatory rate and F2 IQR were at least moderately correlated with scaled intelligibility for about half of the PD speakers. F0 and SPL were correlated for one third of PD speakers. Except for F0 SD, F0 Range and Mean SPL, the direction of the effect varied.

Conclusions: Articulatory rate and F2 IQR appear to partially explain within-speaker variation variations in scaled sentence intelligibility for some speakers with PD. Findings suggest that diversity among speakers with PD should be considered when interpreting results from group analyses.