

## Using Speech Resynthesis to Identify Acoustic Variables Explaining the Clear Speech Intelligibility Benefit

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**Purpose:** Segmental and suprasegmental acoustic variables explaining intelligibility variation associated with the clear speech instruction “overenunciate” were investigated using a speech resynthesis paradigm.

**Methods:** Ten speakers with PD and nine controls read sentences in Habitual and Overenunciate conditions. Overenunciate represents a clear speech instruction for maximizing intelligibility. Using waveform resynthesis, six hybridized variants of each sentence were created in which segmental and/or suprasegmental characteristics for a speaker’s Overenunciate production were applied individually or in combination to the corresponding Habitual production. 64 listeners subsequently transcribed hybridized sentence variants as well as the original Habitual and Overenunciate productions.

**Results:** Overenunciate increased intelligibility above Habitual by 14% for the PD group and 7% for Controls. Hybridization involving both short-term spectrum and duration yielded a 6% intelligibility improvement above Habitual for the PD group. Variability among PD speakers was substantial. No hybridized variants were associated with a meaningful improvement in intelligibility above Habitual for controls.

**Discussion:** Change in segmental articulation in combination with duration explains the improved intelligibility associated with the clear speech instruction “overenunciate” for speakers with PD. Hybridization appears to have the most potential for revealing acoustic variables causally related to intelligibility for stimuli characterized by large, naturally-occurring variation in intelligibility.