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THE EFFECTS OF F0, INTENSITY AND DURATIONAL MANIPULATIONS ON THE PERCEPTION OF STRESS IN DYSARTHIC SPEECH

Anja Lowit, Tolulope Ijitona, John Soraghan
University of Strathclyde, Glasgow, United Kingdom

Marking stress plays an important role in conveying meaning and directing the listeners attention to the important parts of a message. Extensive research has been conducted into how healthy speakers produce stress, with the key phonetic cues acknowledged as F0, intensity and duration (Bolinger 1961). We also know that speakers with dysarthria experience problems in marking stress successfully (Lowit et al., 2012, Patel & Campellone, 2009). However, we currently lack sufficiently specific information on these deficits and potential compensatory techniques to allow Speech and Language Therapists (SLTs) to provide effective treatment methods to address stress production problems.

In order to build an evidence base for intervention, it is essential to first establish the relationship between features of disordered stress production and their perceptual outcomes. In particular, we need to know which phonetic cues (or combinations thereof) are most salient and what degree of change needs to be achieved in order to signal stress effectively to listeners.

This project aims to explore these questions in detail by performing perceptual experiments on data from disordered speakers that have been acoustically manipulated, in order to produce guidance to clinicians on how to improve their patients ability to signal stress successfully.

We used contrastive stress sentences from 10 speakers with ataxic dysarthria. Each speaker produced 30 sentences, i.e. 10 sentences (SVOA structures) across 3 conditions (stress on initial (S), medial (O), or final (A) target words). Sentences were perceptually scored by 5 listeners regarding the location of the stress target. We then chose 15 utterances where listeners had been unable to identify the target, five for each of the sentence positions. These utterances were subsequently manipulated acoustically by incrementally increasing the F0, intensity and duration of the target words, in accordance with the degree of change observed in the healthy control group. In addition, pausing patterns as well intonation contours were altered. The manipulated utterances were played to 50 listeners to evaluate what degree and combination of alteration resulted in correct identification of the stress target.

We will report on the patterns of impairment observed in the disordered speech samples, as well as the impact of the above manipulations on listener accuracy. This will provide information for future studies on stress production regarding focus of analysis, as well as guide clinicians on how best to address deficits in this area in their patients.

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