Effect of delayed auditory feedback levels on vowel duration

Dysarthria is one possible speech disorder resulting from brain injury. Several distinct perceptual and acoustic characteristics result from impaired motor control and abnormal speaking rates. Therefore, many brain-injured individuals are unable to control the muscles for precise speech. Following brain-injury, some individuals speak too rapidly, resulting in decreased articulation (e.g., distorted vowels and consonants). Delayed Auditory Feedback (DAF) is one approach used to reduce speaking rate and improve their speech. The person speaks into a microphone while listening to their speech through headphones, but with a slight delay. Typically, when people hear their own speech at a slight delay, their speech becomes slower and more deliberate. It is hypothesized that by reducing speaking rate using DAF, individuals with dysarthria will show improved speech by increasing vowel length. As part of a larger study of dysarthric speech, this initial investigation studied the effects of various DAF settings on vowel length and sentence duration in non brain-injured individuals. Seven young adults with no history of brain injury repeated 15 sentences under five DAF settings (0 ms, 150 ms, 175 ms, 200 ms, and 225 ms) while hearing their delayed speech under headphones. Their speech was digitally recorded and vowel length was measured using the Computer Speech Lab (CSL). Results indicate that when DAF was used, there was a significant increase in overall sentence duration, as well as for each of the four vowels and four diphthongs measured. This suggests that these subjects reduced their speaking rate in response to DAF. This effect was evident even when the lowest DAF setting (i.e., 150 ms.) was used. Since DAF is a valid means to reduce speaking rate, further studies are necessary in order to continue to develop this technique for clinical use with dysarthric speakers who have suffered a brain injury.