The Effect of Loudness on Articulatory Function in Non-Dysarthric Speakers with Parkinson's Disease

B. Murdoch, M. Kuruvilla, J. Goozée, L. Goozée

Acoustic and kinematic evidence of reduced tongue strength, lip muscle rigidity, and reduced amplitude and velocity of lip and jaw movements have been documented in speakers with Parkinson's disease (PD). Since PD is a progressive neurological disease, monitoring lingual motor control using dynamic kinematic measures may reflect exacerbation of symptoms over time. The present investigation explored lingual kinematics in eight non dysarthric speakers diagnosed with idiopathic PD during both habitual and loud sentence repetition tasks using the Electromagnetic Articulograph (EMA). Since loudness manipulation forms an integral part of dysarthria management in speakers with PD, the loud speech task was incorporated in the current investigation to determine the effects of increasing loudness on articulatory kinematics in non dysarthric speakers that may have subclinical articulatory impairment. Comparisons between an age and sex matched non-neurologically impaired control group and the PD group revealed reduced speed of tongue-tip movements and prolonged overall durations in the presence of comparable overall distances to the control group. Loudness related scaling of articulatory kinematics was documented within each participant group. The implications of the presence of subclinical changes in lingual kinematics for the management of persons with PD are discussed.