

## **ABSTRACT**

Title: Effects of Phonetic Complexity on Tongue Motor Performance in Progressive Dysarthria

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Phonetic complexity, characterized by the articulatory motor adjustments required to produce speech, is an important attribute of stimuli that may potentially increase the sensitivity of articulatory assessments. As a first step towards improved assessment for progressive dysarthrias, this study sought to compare tongue kinematic performance between talkers with Parkinson's disease (PD) and controls across stimuli varying in phonetic complexity. Tongue movements were recorded from 20 participants with PD and their age- and sex-matched healthy controls, while they produced words of varying phonetic complexity. Phonetic complexity was calculated using the framework proposed by Kent (1992) which takes into consideration the articulatory motor adjustments required for each speech sound. A convex hull was fitted around the 3D movement path of each tongue sensor (tip, blade, dorsum) and its volume was used to quantify articulatory working space. Further, movement speed was examined for each sensor. We expect greater between-group differences in tongue motor performance as phonetic complexity increases. Based on the findings of this study, speech stimuli that test a wide range of articulatory skills can be chosen for assessment, to provide a more accurate estimate of articulatory decline and dysarthria progression.