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Articulatory Kinematics of Alternating and Sequential Motion Rate Diadochokinesis

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Oral Diadochokinesis (DDK) tasks are commonly used in the assessment of speech motor function. Two forms of DDK are typically used clinically. Alternating motion rates (AMR) require the talker to produce repetitions of the same syllable. Sequential motion rates (SMR) require the talker to produce repetitions of a sequence of syllables. Previous research has demonstrated that articulatory kinematics during AMR differ from the same syllables produced during connected speech. SMR has not been studied. Additionally, the extent to which either task may be sensitive to neuromuscular control differences between slow and fast talkers has never been assessed. The specific aim of the current work is to determine if the articulator movements associated with SMR are fundamentally different from those characteristic of AMR and if task performance differs between slow and fast talkers. Tongue, lip, and jaw movements were compared between AMR and SMR tasks elicited from 15 healthy, young-adult subjects and registered using electromagnetic articulography. Results suggest that the tongue often exhibits greater speed and extent of motion during SMR than AMR, but that the lower lip often exhibits greater speed and extent during AMR than SMR. Additionally, AMR performance reveals larger differences between slow and fast talkers than SMR.