

Articulatory-acoustic and kinematic relationships in
comfortable and loud speech
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Adjustments in the configuration of the vocal tract from articulatory movements systematically alter vowel acoustics. The Articulatory-Acoustic Vowel Space (AAVS), a measure of working formant space calculated from continuously sampled formant data from connected speech, has been shown to track clarity-related articulation changes within participants. No data, however, on the relationship between the AAVS and articulatory kinematics are available. The current study examined the relationship between the AAVS and its kinematic equivalent, the Articulatory-Kinematic Vowel Space (AKVS), which was measured from lingual movements during connected speech. Acoustic and kinematic versions of the vowel space measure were compared from repetitions of two different stimuli produced at both loud and comfortable intensities. Moderate-to-strong relationships (r greater than 0.5) between the AKVS and the AAVS were observed within individuals. Across all participants, the AAVS alone accounted for nearly a third of the variance in the AKVS for the front tongue marker data, with additional between-participant differences accounting for a large proportion of the total variance. These data reveal that that AAVS is significantly related to a lingual kinematic equivalent within participants.