

## Lower Lip and Jaw Speed Capacity of Young, Middle-Aged, and Older Adults

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**Abstract:** Although it is well documented that speech and swallowing function decline with age, the underlying reasons are only poorly understood. Motor performance decline has been commonly discussed as a contributing factor; however, studies on orofacial motor capacities are rare. Aging research on limbs has shown movement speed declines with age; however, cranial muscles differ in many ways from skeletal muscles. The limbs may, therefore, not serve as a good model to predict changes in the orofacial system. To address the current knowledge gap, the current study sought to determine aging effects on orofacial motor capacity. This study included 36 participants in the following age groups: 20-27, 45-55, and 65-74. Lower lip and jaw movements were captured using a motion capture system. Reflective markers were placed on on the jaw, lower lip, and forehead. All participants completed metronome paced fixed-target tasks, a task specifically designed to experimentally control the duration and excursion of the movements. Metronome paces ranged from 1.4 Hz (slow) to 6.7 Hz (very fast). The 3D Euclidean distance signal between the center lower lip marker or the left jaw marker and the left bottom head marker were used to calculate peak speeds at each metronome pace. Elicited peak speeds were compared across age groups to determine aging effects on speed capacity. Kinematic findings suggested that jaw and lower lip speed capacity does not decline with age. Findings were discussed with regards to limb motor performance in older adults, as well as reported declines in speech production.

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