Models of speech motor control and language production do not address the issue of 'interaction' of language and speech motor processes (e.g., how increasing or decreasing linguistic demands affect speech motor characteristics). This investigation compared lip kinematics during bilabial closure between individuals with aphasia and normal speakers when the linguistic characteristics of the stimuli were varied by increasing the number of syllables. Five individuals with aphasia (AS) and five normal speaking individuals (NS) who were matched for age and gender participated in this study. Movement data from upper lip (UL) and lower lip (LL) were collected using Electro-Magnetic Midsagittal Articulography (EMMA, AG 100) for monosyllable (/pa/, /ip/), bisyllable (/api/, /ipa/) and trisyllable (/pipater/, /papipter/) nonwords. Single articulatory kinematics (peak velocity, amplitude, duration, and cyclic spatio-temporal index) were measured for lip movements for bilabial closure.

It was found that an increase in linguistic complexity does affect lip movement kinematics. The monosyllables demonstrated smaller peak velocities, smaller amplitudes and shorter durations as compared to bi- and tri-syllables, and movement stability was lowest for the trisyllables. In addition, compared to normal speakers, individuals with aphasia showed significantly longer movement duration and lower movement stability for linguistically complex items (bi- and tri-syllables). The findings in general provide support for the notion that linguistic demands influence speech movement characteristics, and these kinematic changes resulting from linguistic and motoric manipulations were easier to instantiate for linguistically simple items.