Measuring tongue movements: An ultrasound study

Tanja Kocjancic

The main aim of the study is to explore a technique for describing tongue movements as a function of increasing syllable onset complexity with a view to comparing normal speakers and speakers with developmental apraxia of speech. Three parameters are proposed to describe tongue movements: distance traveled over the syllable, the syllable duration and the speed. The total distance traveled for the whole syllable is the sum of the average distances between all the consecutive spline pairs. The splines of a pair are first cut at the same minimum and maximum x values and interpolation is used to obtain an equal number of points on both splines. The distance between the points of a pair of splines is measured using the nearest neighbour technique. In addition to the distance, duration of the target syllable will be measured to observe temporal differences between the syllables and to allow calculation of the overall speed of the tongue movement. Speech material consisted of six words differing in the type and number of onset segments: /[peɪ]/, /[seɪ]/, /[leɪ]/, /[pleɪ]/, /[sleɪ]/, and /[spleɪ]/, and were uttered by ten adult native English speakers. Results will serve as a baseline for future study of tongue movements in developmental apraxia of speech. Furthermore, measuring tongue movements with the proposed parameters enables investigating where in the syllable is the region of the greatest change and how this is affected by differently structured onsets.