Parkinson’s disease (PD) is a degenerative neurological disorder characterized by the degeneration of dopaminergic neurons. Dopamine is involved in the regulation of motor planning and control, and hence speech is a faculty often affected by PD. The most common diagnosis for the speech impairments in PD is hypokinetic dysarthria (Darley, Aronson, & Brown, 1969a,b). This is characterized (clinically) by slowed muscle activation, muscle rigidity, variable rate and imprecise consonant articulation.

Complex synergies of the muscles are necessary to coordinate tongue motion for linguistic purposes (Stone, Epstein, & Iskarous, 2004). It is therefore hypothesized that, as a result of the impairments above, PD subjects may produce less complex tongue shapes than control subjects during speech. In order to test this hypothesis, ten PD subjects (\(x = 63.8, \text{sd} = 11.3\)), seven older controls (\(x = 56.7, \text{sd} = 4.6\)) and ten younger controls (\(x = 23.1, \text{sd} = 2.2\) years) were imaged using ultrasound. The subjects were native Canadian French speakers, who produced multiple repetitions of voiced stop – vowel – C stimuli.

Results will be discussed in terms of the differences in shape complexity between PD and control subjects. The suitability of different shape analysis techniques for this data will be discussed, as will future directions in using quantitative parameters to track the course of PD as it affects the speech system.

