

Neural correlates of speaking rate and phonatory control  
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Previous research investigating neural correlates of speech rate has identified disparate patterns of brain activations in cerebellar and basal ganglia structures, indicating increased activation of cerebellum and decreased activation of basal ganglia with increased speech rate (Riecker et al., 2006). Phonatory duration covaries with speech rate, with shorter phonated intervals associated with fast rate of speech and long intervals with slow rate of speech, raising the possibility that neural activations previously linked to speech rate may be a result of phonatory duration. The present work represents a systematic replication of Riecker and colleagues' study of cerebral control of speech rate in eight healthy adults, using BOLD fMRI to examine activation of neural regions in speech in which rate and syllable duration are manipulated independently. Initial findings in two healthy males show overall increased activation of both cerebellum and basal ganglia in fast vs. slow rate speech. Activations related to phonatory duration showed opposite patterns for cerebellum and basal ganglia, with less cerebellar and greater basal ganglia activation in short vs. long syllables. Findings to be presented from a larger sample will clarify understanding of the role of cerebellum and basal ganglia in control of speech rate and phonation.