

Motor slowing is associated with cognitive decline in aging, resulting in diminished mobility, cognition, and quality of life. In Parkinson's disease (PD), these cognitive-motor dysfunctions are exacerbated, with 30-60% of early to mid-stage PD patients exhibiting motor arrests (MA) during repetitive movements that are strongly associated with more rapid cognitive-motor decline.

While MA are evidenced by the motor system, they can be evoked by cognitive stimuli, indicating the importance of integration between cognitive and motor brain networks in producing adaptive motoric responses to environmental stimuli. We hypothesize that the dynamic interactions between cognitive (fronto-parietal executive control) and motor (striatocerebellar-somatomotor cortex) networks results in a lessened ability to adaptively respond to performance feedback that is fully expressed in PD with MA. The collection of task and resting fMRI data among PD patients with and without MA will permit a preliminary test of this hypothesis and support our efforts to secure extramural funding.