People with Parkinson’s disease (PD) often have impaired mobility, which adversely affects quality of life.
• Adapted tango dance, in which participants both lead (internally guide: IG) and follow (externally guide: EG) dance steps may be effective for improving mobility. 4,5
• IG and EG movements have distinct brain activity patterns. To improve outcomes in those with PD, the underlying brain mechanisms for both motor impairments and improvement must be studied.
• Individuals with PD have trouble with IG movement but strategies used while “leading” may help.
• During “following”, participants with PD can use external cues, which helps movement in PD, because EG tasks bypass the basal ganglia, the part of the brain affected by PD. 3

Fig. 1. Progression and treatment of Parkinson’s. Individuals with PD have impaired mobility and difficulty initiating movement, but rehabilitation can improve mobility.

Pilot Work in Foot Tapping Paradigm

Fig. 7. Axial (left), coronal (middle), and sagittal (right) views of region of interest (putamen) in pilot fMRI scan of a healthy 37-year-old, right-handed male during IG foot tapping. Peak coordinates provided for a cluster of interest involving twenty-seven, 3x3x3 voxels: 22.7, -27.7, -4.3, peak coefficient= 0.504, t-stat= 7.38.

Fig. 8. fMRI coronal (left) and sagittal (right) images showing cerebellar activation during EG movement. These images, taken from the pilot experiment, indicate that the cerebellum is used during EG movement.