

Cognitive Difficulties in Multiple Sclerosis: The Importance of Performance Variability  
Magdalena Wojtowicz, Psychology Resident

Cognitive deficits are highly prevalent in multiple sclerosis (MS) and have a negative impact on daily life. Impairments in information processing speed are among the most commonly reported deficits in MS and are generally assessed by examining average slowing in speed. However, this approach ignores potential within-subject differences that may be useful for characterizing cognitive difficulties in MS. Objective: Examining within-person variability in performance as an alternative method to characterizing cognitive deficits in MS. Participants: Clinic attending relapsing remitting MS females and matched healthy controls. Measures: Cognitive tasks of information processing speed and attention, as well as resting-state functional magnetic resonance imaging (rsfMRI) and diffusion tensor imaging (DTI). Results: MS patients demonstrated greater performance variability on tasks of attention and information processing speed. Performance variability was found to better distinguish MS patients from matched groups of healthy control subjects when compared to common clinical measures of cognitive performance or average response speed. MS patients with less performance variability demonstrated greater functional connectivity between two regions in the frontal lobe (i.e. ventral medial prefrontal cortex and left frontal pole). Greater performance variability was found to be associated with worse white matter integrity within MS patients. Conclusions: Together, the findings demonstrate that IIV is an important characteristic of cognitive performance in persons with MS and may provide new insights into the cognitive deficits present in this disease.