

Neuropsychology/early detection of cognitive decline with neuropsychological tests

Slowed processing speed contributes to cognitive deficits in amnestic and non-amnestic mild cognitive impairment

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Ana M. Daugherty, Wayne State University, Detroit, MI, USA.

Email: ana.daugherty@wayne.edu**Abstract**

Background: Mild cognitive impairment (MCI) is characterized by deficits across functional domains, with pronounced memory impairment among amnestic (aMCI) patients. The mixture of cognitive complaints is a challenge in diagnosis and is further complicated by interactions between cognitive domains that are typical for neuropsychological performance.

Method: We aim to examine if slow processing speed may convey MCI-related deficits across cognitive domains in a sample of African American adults (ages 56-90): 61 cognitively typical, 28 aMCI, and 14 non-amnestic MCI. Working memory, executive function, declarative memory and processing speed indices were estimated in structural equation modeling, including indirect effects with bootstrapped 95% confidence intervals (CI).

Result: MCI diagnosis predicted deficits in processing speed ($b=-0.53$, $p=0.02$), executive function ($b=-0.37$, $p=0.03$), working memory ($b=-0.62$, $p=0.001$), and episodic memory ($b=-0.61$, $p<0.001$). Slow processing speed predicted low function across domains and in turn partially accounted for effects of diagnosis on executive function (-0.21 , CI: $-0.37/-0.10$), working memory (-0.12 , CI: $-0.24/-0.05$) and a non-significant trend for declarative memory (-0.05 , CI: $-0.15/0.01$). Slow processing speed explained approximately 36% of MCI-related deficits in executive function, 16% in working memory and 8% in declarative memory. In comparison between typical aging and specifically aMCI, processing speed explained deficits in executive function (-0.19 , CI: $-0.39/-0.06$; 37% indirect) and working memory (-0.09 , CI: $-0.22/-0.01$; 13%), and a non-significant trend in declarative memory (-0.06 , CI: $-0.19/0.00$; 8%).

Conclusion: Slowed processing speed contributes to typical cognitive aging and conveys MCI-related deficits across domains. Identification of deficits in processing speed may provide insight into MCI progression and opportunities for clinical intervention.