ABSTRACT

Applying a Metacognitive Framework in the Neuropsychological Assessment of Subjective Cognitive Decline and Mild Cognitive Impairment

BY

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The characterization of the earliest stages of Alzheimer's disease (AD) is a topic of major research interest because it is critical for early diagnosis and emerging interventions. Metamemory, or knowledge about memory, including awareness of one’s own memory functions, has been investigated in AD especially in relation to how impairment in memory and executive functions contribute to unawareness of cognitive deficits, termed anosognosia. Previous research, however, has not systematically investigated metamemory functioning in older adults with prodromal dementia conditions. Therefore, we investigated metamemory accuracy in cognitively healthy older adults (HC) and those with subjective cognitive decline but intact neuropsychological test scores (SCD), amnestic mild cognitive impairment (aMCI), and non-amnestic mild cognitive impairment (naMCI), all recruited from a longitudinal study of cognitive aging (Einstein Aging Study). Two studies respectively examined group differences in the accuracy of retrospective metamemory judgments (Empirical Study 1) and prospective metamemory judgments (Empirical Study 2) made during the monitoring of retrieval and encoding processes. Results showed that metamemory accuracy was weak in naMCI participants compared to controls, suggesting poor monitoring during both retrieval and encoding. In
addition, although there was some evidence that retrospective monitoring processes may be suboptimal in aMCI compared to HC (Empirical Study 1), prospective metamemory monitoring processes were relatively intact in these individuals (Empirical Study 2), suggesting that performance monitoring of retrieval processes (which is more dependent on basic memory functions) may be differentially affected in aMCI. Furthermore, both studies revealed preserved metamemory accuracy in SCD, suggesting that performance monitoring of retrieval and encoding is intact in these older adults who present with subjective cognitive impairment and who may represent a pre-MCI condition. In addition, results revealed preserved memory self-awareness and self-knowledge in SCD (Empirical Study 2), providing further evidence that these individuals are capable of accurate self-assessment of their subjective experience of cognitive change. Overall, our novel findings support the hypothesis that metamemory performance varies across the neurodegenerative continuum and differentially impacts mechanisms in the metamemorial system that rely on memory (temporal lobe integrity) and/or executive functioning (prefrontal brain systems). Findings also inform remediation efforts such as the potential benefit of targeting specific metacognitive weaknesses (poor error detection, errors in evaluation during performance monitoring), in older adults with naMCI.