**Results:** We observed significant PEs for 5 of the 6 measures in the cognitively unimpaired group and 4 measures in the baseline MCI group. PEs did not uniformly decrease across time; some—specifically on episodic memory measures—continued to increase beyond the first follow-up for both groups of participants. Without accounting for PEs, cognitive function appeared to improve or stay the same. In contrast, when PEs were included in the models, cognitive function appeared to decline or stay the same across time.

**Conclusions:** The replacement method of PE adjustment revealed significant PEs across two follow-ups. PEs for episodic memory, in particular, did not level out, but actually increased after the first follow-up, two years after baseline. As expected in these older adults, accounting for PEs revealed cognitive decline, in some cases, even when PE-unadjusted scores improved. This method of assessing PEs, in turn, means earlier detection of cognitive deficits, including progression to MCI, and more accurate characterization of longitudinal change.

**Categories:** Aging
**Keyword 1:** aging (normal)
**Keyword 2:** mild cognitive impairment
**Keyword 3:** neuropsychological assessment
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## 5 Large-Scale Network Connectivity and Cognitive Function after Exercise Training in Older Adults

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**Objective:** Despite growing evidence regarding the association between exercise training (ET) and functional brain connectivity, little is known about the effects of ET on within- and between-network functional connectivity (FC) of core brain networks. We investigated the effects of ET on within- and between-network functional connectivity of the default mode network (DMN), frontoparietal network (FPN), and salience network (SAL) in older adults with intact cognition (CN) and older adults diagnosed with mild cognitive impairment (MCI). We further examined whether the ET-induced changes in FC were associated with changes in cognitive performance.

**Participants and Methods:** 33 older adults (78.0±7.0 years; 16 MCI and 17 CN) participated in the present study. Before and after a 12-week walking ET intervention, participants underwent cardiorespiratory fitness tests, the Controlled Oral Word Association Test (COWAT), the Rey Auditory Verbal Learning test (RAVLT), a narrative memory test (logical memory; LM), and a resting-state fMRI scan. We examined the within- and between-network connectivity of the DMN, FPN, and SAL before and after ET. We also used linear regression to examine associations between ET-related changes in the within- and between-network connectivity and cognitive function.

**Results:** There were significant improvements in $\dot{V}O_{2peak}$, COWAT, RAVLT, and LM after ET across participants. Significant increases in within-network connectivity of the DMN and SAL were observed in response to ET across participants. FC between the DMN-FPN, DMN-SAL, and FPN-SAL were also increased after ET. Moreover, greater SAL within connectivity and FPN-SAL between connectivity were associated with enhanced LM immediate recall performance after ET. There were no significant interactions between Time (before vs after ET) and Group (CN vs MCI) for network connectivity or cognitive function.

**Conclusions:** Our findings suggest that increased within- and between-network connectivity following 12-weeks of walking exercise may subserve improvements in memory performance in older individuals with intact cognition and in those diagnosed with MCI.

**Categories:** Cognitive Intervention/Rehabilitation
**Keyword 1:** mild cognitive impairment
**Keyword 2:** neuroimaging: functional connectivity
**Keyword 3:** cognitive neuroscience
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