

# Mindfulness Training Improves Cognition and Resting-state Connectivity Between The Hippocampus and Posteromedial Cortex



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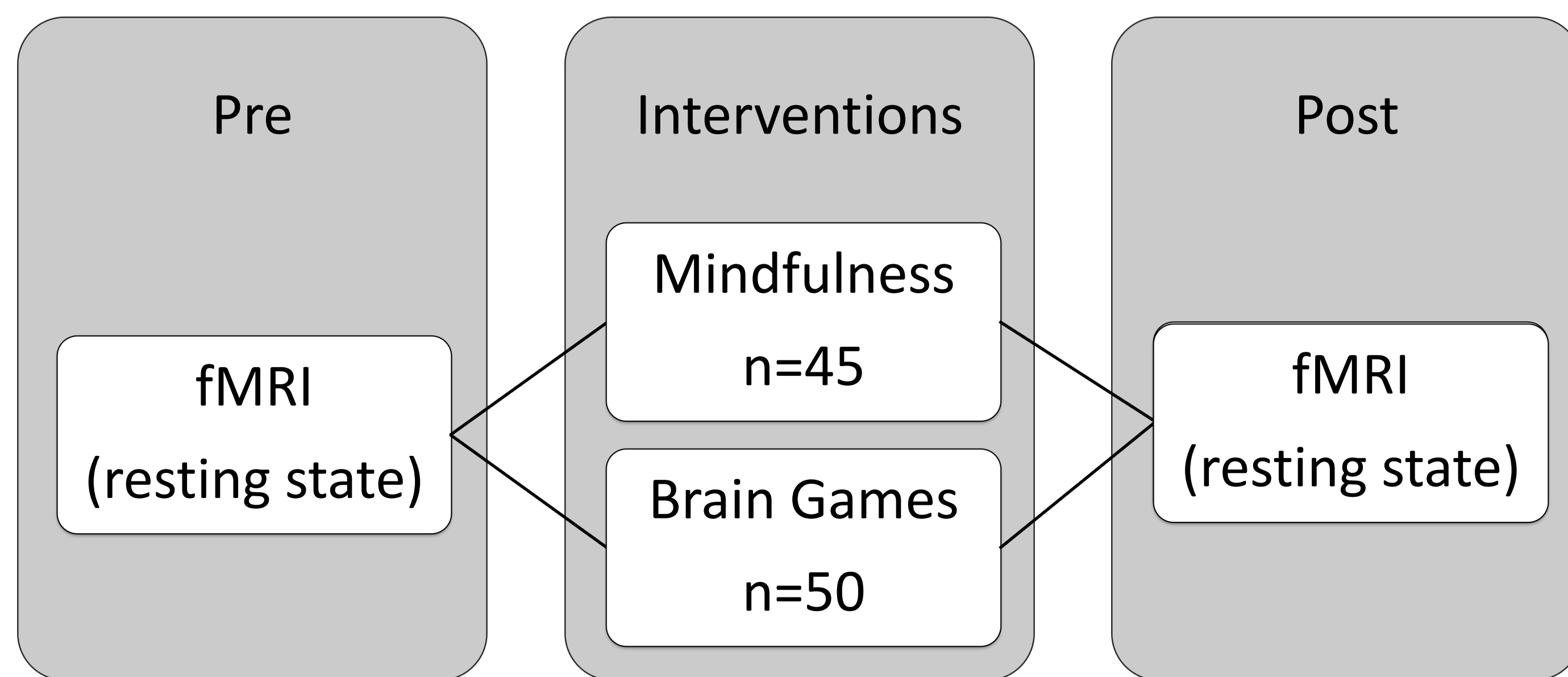
## INTRODUCTION

With increases in life expectancy, maintaining optimal neurocognitive functioning throughout the lifespan became a public health priority. Recently, mindfulness-based interventions have been implicated in enhancing cognition in cognitively normal older adults, however the mechanisms associated with these improvements remains unknown.

Consistent with a state of high sustained attention and low mind wandering, several studies have documented alterations in hippocampal and posterior cingulate cortex activity, as well as increased connectivity between these regions both during meditation and during rest. The intrinsic connectivity between these regions has also been associated with individual differences in memory performance among cognitively intact older individuals.

Relying on these findings, we hypothesized that, in older adults, mindfulness training dependent improvements in cognition will be associated with enhanced connectivity between the hippocampus and posterior cingulate cortex.

## METHODS

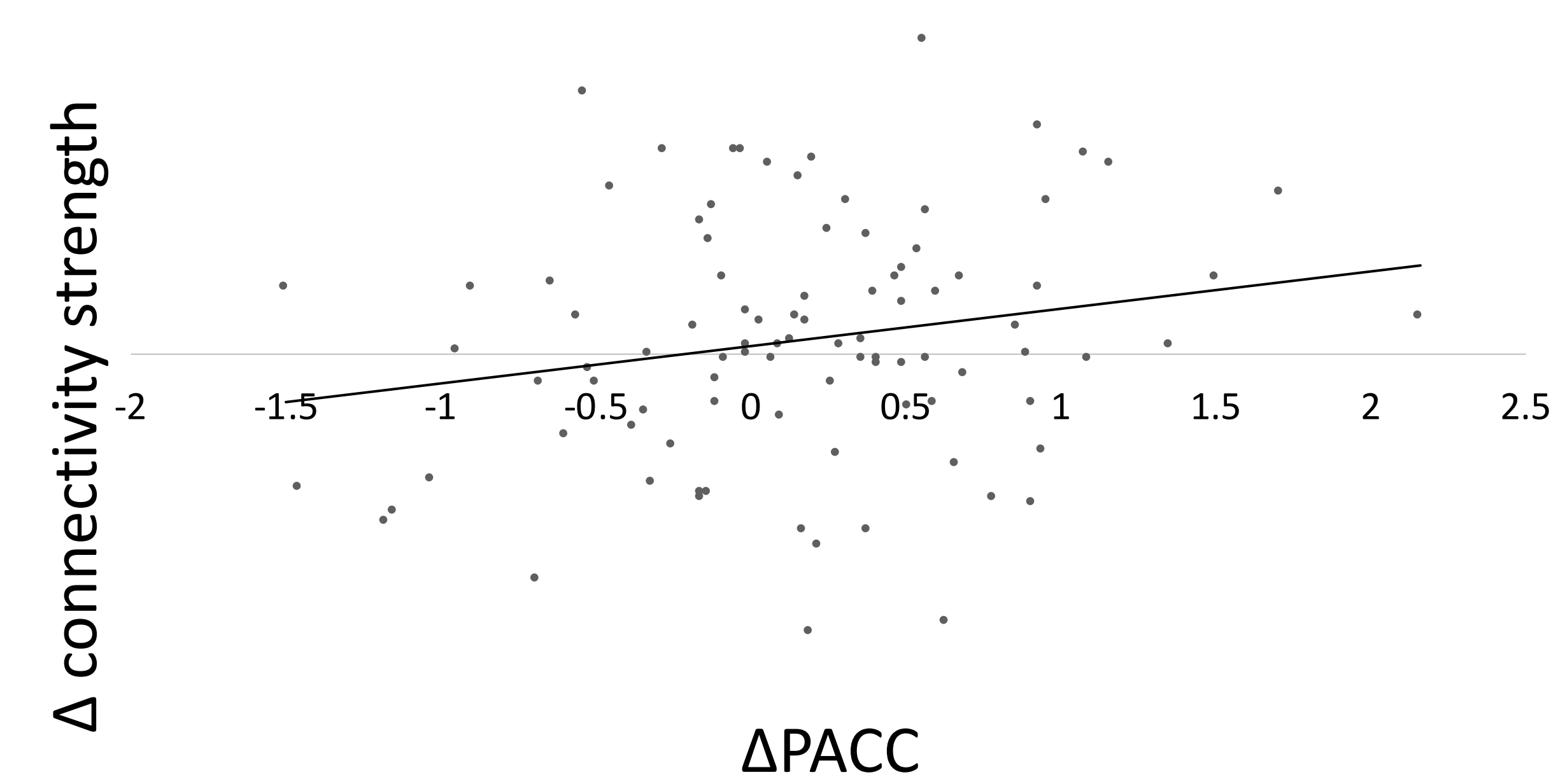


In order to test our hypothesis we randomized healthy, cognitively normal, older adults (65-80 years old) either to an 8-week mindfulness training (MT, n=45) or to a games-based cognitive fitness program (CFT, n=50). We measured improvements in cognition using Preclinical Alzheimer Cognitive Composite (PACC), that includes tests of episodic memory, executive function, and global cognition.

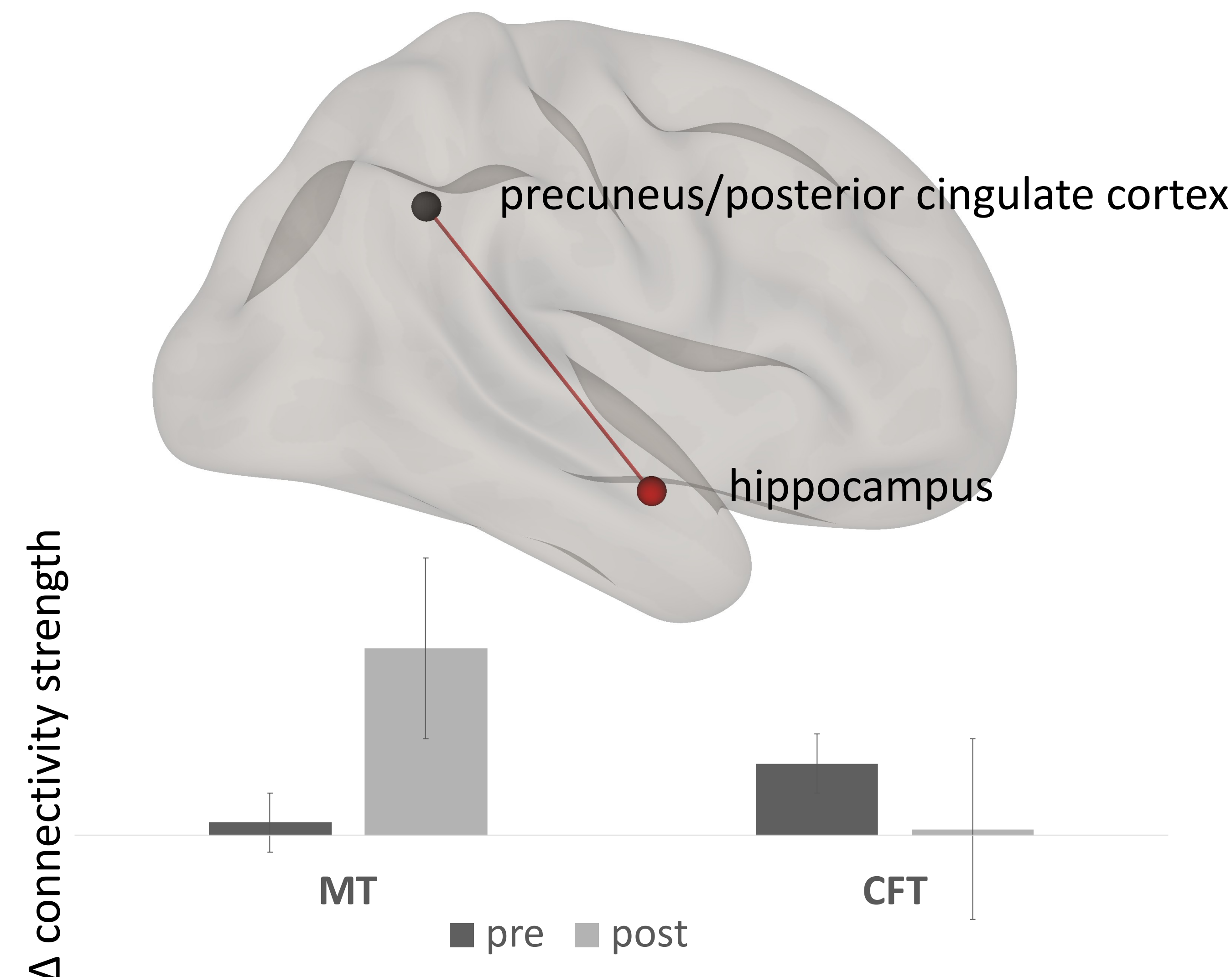
## RESULTS

An investigation of PACC scores revealed no differences between MT ( $0.25 \pm 0.66$ ) and CFT ( $0.09 \pm 0.65$ ) in cognitive performance.

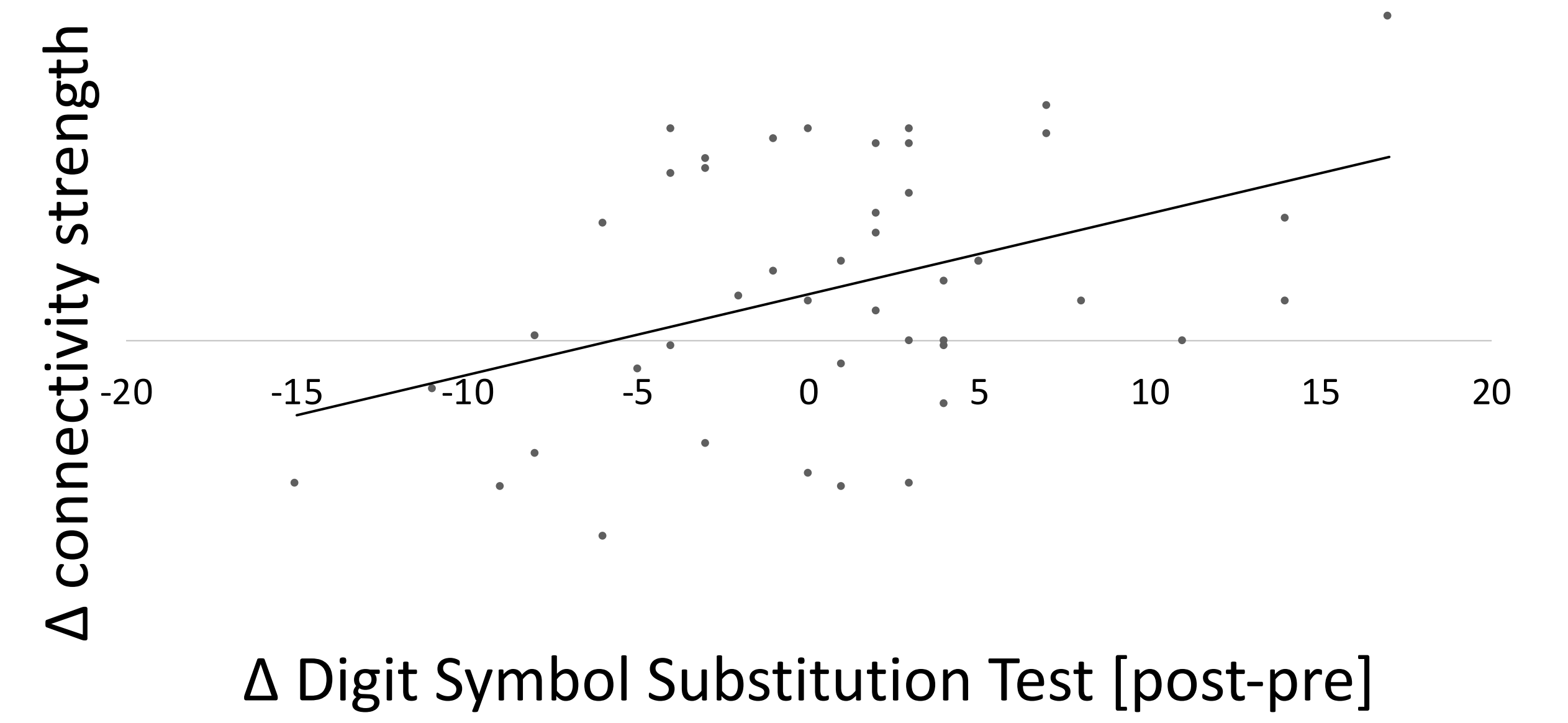
**Improvement in cognition was associated with enhanced intrinsic connectivity between the right posteromedial cortex and the right hippocampus when combining data from both groups.**



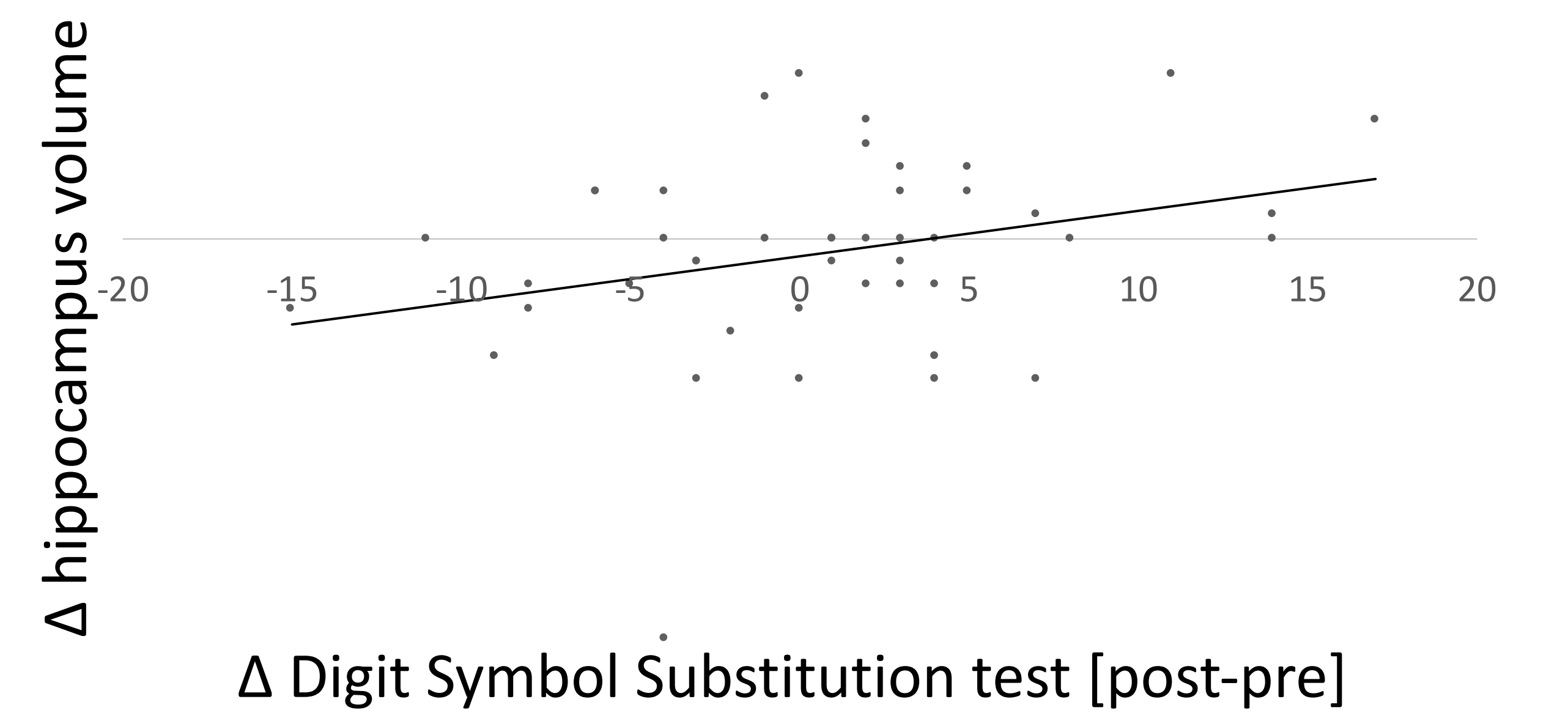
**Mindfulness training was associated with differential increases in the connectivity strength between the posteromedial cortex and the hippocampus (right hemisphere)**



**Mindfulness training dependent improvements in Digit Symbol Substitution Test were associated with Δ connectivity strength between the posteromedial cortex and the hippocampus**



**Mindfulness training dependent improvements in Digit Symbol Substitution Test are associated with Δ gray matter volume in the hippocampus**



## CONCLUSION

These findings suggest that intrinsic connectivity between the hippocampus and posteromedial cortex is associated with enhanced cognitive performance following mindfulness training in cognitively intact older individuals. Mindfulness-based interventions can help promote successful neurocognitive aging through enhanced connectivity within this memory network.