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76 Baseline Frontoparietal Gray Matter Volume Predicts Executive Function Performance at 24-Months in Early and Late Mild Cognitive Impairment

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Objective: To examine the relationships between baseline gray matter volumes, diagnostic status, and executive function performance at 24-month follow-up, and the relative importance of predictors of executive function in a cohort of non-demented older adults.
Participants and Methods: The study sample included 147 participants from the Alzheimer's Disease Neuroimaging Initiative (mean age = 70.6, SD = 6.4; mean education = 17 years, SD = 2.4). At baseline, 49 participants were diagnosed as cognitively normal (CN), 60 as early mild cognitive impairment (EMCI), and 38 as late mild cognitive impairment (LMCI). Magnetic resonance imaging (MRI) data were collected at baseline. A composite score of executive function and FreeSurfer-derived gray matter regions-of-interest (ROI; whole brain, superior frontal gyrus, middle frontal gyrus, inferior frontal gyrus, orbitofrontal cortex, anterior cingulate cortex, superior parietal lobule, inferior parietal lobule, hippocampus) were examined. Hierarchical linear regression models were employed to assess whether brain volume predicted executive function at 24-month follow-up and interaction effects between baseline ROI volume and diagnostic status. Age, gender, education, Mini-Mental State Examination scores, and APOE-e4 allele status were included as control variables in each model. Relative importance metrics, which quantifies an individual regressor's contribution to a multiple regression model, were computed using the Lindemen, Merenda, and Gold (lmg) method to assess the relative contribution of each variable in predicting executive function performance.
Results: Across all participants, baseline gray matter ROI volume accounted for a significant amount of variance in executive function at 24-months after accounting for control variables. Specifically, anterior cingulate cortex and superior parietal lobule accounted for an additional 7% and 6% of variance in executive function at 24-months. Significant brain region X diagnostic status interaction effects were observed in executive function performance at 24-months. Relative importance metrics within each group indicated that age is the most important predictor of executive function at 24-months for CN, anterior cingulate cortex is most important for EMCI, and Mini-Mental Examination score is most important for LMCI.
Conclusions: Our findings implicate frontoparietal gray matter regions as significant predictors of executive function performance at 24-months, and that this relationship is moderated by diagnostic status. Our results indicate that the value of specific variables to predict executive function performance varies based on diagnostic status. Specifically, anterior cingulate cortex was a significant predictor of executive function performance across all participants and was the most important variable in predicting performance in the earliest stage of mild cognitive impairment. These results support previous studies examining gray matter correlates of executive function and extend the literature by exploring predictors of executive function in early and late stages of mild cognitive impairment.

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77 Differentiating Amnestic Versus Non-Amnestic Mild Cognitive Impairment Using the NIH Toolbox Cognition Battery

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