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Objective: Prior research supports retirement may negatively impact cognitive functioning. The current study examined the relationship between retirement status and the level of cognitive dysfunction amongst individuals with Alzheimer's disease (AD). For the purpose of this study, it was predicted that there would be significantly higher levels of cognitive dysfunction in retired participants after controlling for age.
Participants and Methods: Participants (ages 65 to 91) were drawn from the Alzheimer's Disease Neuroimaging Initiative (ADNI). The sample included 110 participants who were retired and 111 participants who were not retired. Cognitive dysfunction was assessed using the cognitive subscale of the modified Alzheimer's Disease Assessment Scale (ADAS). A one-way ANCOVA analysis was conducted with cognitive dysfunction as the dependent variable and the age of the participants as a covariate.
Results: The results of the one-way ANCOVA showed being retired was a significant predictor of greater cognitive dysfunction amongst individuals with AD after controlling for age ($F(df=1, 218) = 231.143$, $p = < .001$, $p < .05$) and accounted for 52% of the variance in the level of cognitive dysfunction.
Conclusions: Being retired is associated with higher levels of cognitive dysfunction in AD after accounting for the effects of age. As such, continued cognitive activity may slow the progression of cognitive declines amongst individuals with AD who are retired. There is a need for future longitudinal research to determine how late retirement may delay the progression of cognitive decline in AD by controlling for other moderator factors such as genetics and work-related stress.

Categories: Aging
Keyword 1: neurocognition
Keyword 2: dementia - Alzheimer's disease
Keyword 3: neuropsychological assessment
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61 Network Segregation Predicts Processing Speed in the Cognitively Healthy Oldest-old

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Objective: Understanding the factors contributing to optimal cognitive function throughout the aging process is essential to better understand successful cognitive aging. Processing speed is an age sensitive cognitive domain that usually declines early in the aging process; however, this cognitive skill is essential for other cognitive tasks and everyday functioning. Evaluating brain network interactions in cognitively healthy older adults can help us understand how brain characteristics variations affect cognitive functioning. Functional connections among groups of brain areas give insight into the brain's organization, and the cognitive effects of aging may relate to this large-scale organization. To follow-up on our prior work, we sought to replicate our findings regarding network segregation's relationship with processing speed. In order to address possible influences of node location or network membership we replicated the analysis across 4 different node sets.
Participants and Methods: Data were acquired as part of a multi-center study of 85+ cognitively normal individuals, the McKnight Brain Aging Registry (MBAR). For this analysis, we included 146 community-dwelling, cognitively unimpaired older adults, ages 85-99, who had undergone structural and BOLD resting state MRI scans and a battery of neuropsychological tests. Exploratory factor analysis identified the

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processing speed factor of interest. We preprocessed BOLD scans using fmriprep, Ciftify, and XCPEngine algorithms. We used 4 different sets of connectivity-based parcellation: 1)MBAR data used to define nodes and Power (2011) atlas used to determine node network membership, 2) Younger adults data used to define nodes (Chan 2014) and Power (2011) atlas used to determine node network membership, 3) Older adults data from a different study (Han 2018) used to define nodes and Power (2011) atlas used to determine node network membership, and 4) MBAR data used to define nodes and MBAR data based community detection used to determine node network membership.
Segregation (balance of within-network and between-network connections) was measured within the association system and three well-characterized networks: Default Mode Network (DMN), Cingulo-Opercular Network (CON), and Fronto-Parietal Network (FPN). Correlation between processing speed and association system and networks was performed for all 4 node sets.
Results: We replicated prior work and found the segregation of both the cortical association system, the segregation of FPN and DMN had a consistent relationship with processing speed across all node sets (association system range of correlations: r=.294 to .342, FPN: r=.254 to .272, DMN: r=.263 to .273). Additionally, compared to parcellations created with older adults, the parcellation created based on younger individuals showed attenuated and less robust findings as those with older adults (association system r=.263, FPN r=.255, DMN r=.263).
Conclusions: This study shows that network segregation of the oldest-old brain is closely linked with processing speed and this relationship is replicable across different node sets created with varied datasets. This work adds to the growing body of knowledge about age-related dedifferentiation by demonstrating replicability and consistency of the finding that as essential cognitive skill, processing speed, is associated with differentiated functional networks even in very old individuals experiencing successful cognitive aging.

Categories: Aging
Keyword 1: aging (normal)
Keyword 2: neuroimaging: functional connectivity
Keyword 3: cognitive neuroscience
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62 Repetition priming of novel geometric shapes is associated with cortical arousal in young adults but spatial attention in older adults

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Objective: Repetition priming is a form of implicit memory in which prior exposure to a stimulus facilitates the subsequent processing of that stimulus. While explicit memory has consistently been shown to decline with age, the effect of age on implicit memory remains unresolved. Most studies examining age-related effects on priming have utilized words or pictures of real objects with pre-existing representations that may differentially involve implicit and explicit memory processes across age groups. Repetition priming may also be influenced by attentional processes during encoding that are differentially affected by age. In a previous study using word-stem completion, we found that individual differences in cortical arousal, but not spatial attention, influenced the magnitude and temporal dynamics of conceptual priming in healthy older adults. The objective of this study is to investigate whether cortical arousal and spatial attention play differential roles in the magnitude and temporal dynamics of repetition priming in young and older adults using novel shapes that do not have pre-existing representations within memory.
Participants and Methods: Healthy young (n=25, M age=19.4) and older adults (n=54, M age=70.0) completed a perceptual repetition priming task that was followed by a recognition memory test and an alerting/spatial orienting task from which behavioral measures of cortical arousal and spatial attention were derived. Older adults also completed a battery of neuropsychological tests. In the perceptual priming task, participants made a speeded judgment on whether novel nonverbal shapes had “closed” or “open” perimeters. Each shape was presented twice: half following the first presentation (immediate repetition) and half after three intervening items (delayed repetition).

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