

collapsed across PPA subtypes. Incidental encoding ($ps = <.01$), effortful encoding ($ps < .05$), and delayed recall ($ps < .01$) declined for both words and shapes over time. Copy and recognition of words ($ps < .05$), but not shapes declined over time.

Conclusions: The current results are consistent with prior findings of relative preservation of memory for nonverbal compared to verbal material in PPA as measured by 3W3S, especially in the semantic subtype. Learning and recall of words and shapes declined over time in all groups, whereas there was selective decline in copy and recognition of words compared to shapes. These results provide evidence of differential patterns of decline in certain aspects of memory over time in PPA and highlight the relative preservation of memory in this language-focused dementia even over time.

Categories: Neurodegenerative Disorders

Keyword 1: neuropsychological assessment

Keyword 2: aging disorders

Keyword 3: language: aphasia

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46 Intrusions in Verbal Fluency Tasks in Mild Cognitive Impairment and Dementia: A Longitudinal Analysis

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Objective: Research shows intrusions in memory tests can predict cognitive impairment in abnormal aging. However, there still is a need for additional research regarding the association of intrusions in verbal fluency tasks and clinical diagnosis of mild cognitive impairment, and dementia. The aim of this research is to determine if there is an association between intrusion totals in verbal fluency tasks and diagnosis, longitudinally (across 3 years), if there are significant differences between category and phonemic fluency tasks in intrusion total scores, and if progression from cognitively normal (CN) to mild cognitive impairment (MCI)

or dementia and from MCI to dementia can be indicated through differences in intrusion scores.

Participants and Methods: Participants were recruited from the Memory Disorders Center at Wien Center for Alzheimer's Disease and Memory Disorders at Mount Sinai Medical Center in Miami, Florida to take part in the ongoing 1Florida Alzheimer's Disease Research Center (ADRC) project. At baseline, participants had an average of 15 years of education ($M = 15.00$, $SD = 3.65$), were an average of 72.24 years old ($M = 72.24$, $SD = 7.99$), and were 62.93% female. At baseline (Visit/ year 1), there were 88 CN, 229 MCI, and 58 dementia participants. Participants were asked to complete Categorical and Phonemic verbal fluency tasks in which correct words said and intrusions were collected. Intrusion totals were quantified as the sum of intrusions within each subsection of the tasks (i.e., fruits, vegetables, and animals for the category; F, L, A, S for phonemic). Intrusion totals and correct words were analyzed across diagnostic groups and progressor vs. non-progressor groups.

Results: Results indicated that intrusions are significantly associated with diagnosis in Phonemic fluency tasks, however, this was not the case for Category fluency tasks. Higher phonemic fluency task intrusions were associated with more severe cognitive decline. In progressor versus non-progressor groups there were no significant differences in intrusion totals. Lower correct scores for category and phonemic fluency tasks were found to be significantly associated with increased severity of diagnosis. Lower correct scores also significantly predicted progressor classification. **Conclusions:** These findings suggest possible association of higher intrusion errors in verbal fluency tasks with more severe cognitive decline. Although these indications were significant, further research exploring intrusions and cognitive diagnosis are still needed.

Categories: Neurodegenerative Disorders

Keyword 1: neuropsychological assessment

Keyword 2: aging disorders

Keyword 3: cognitive neuroscience

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47 Assessing the Feasibility of Cardiorespiratory Exercise During Functional MRI

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Objective: To examine the feasibility of implementing a cardiorespiratory exercise stimulus during functional Magnetic Resonance Imaging (fMRI).

Participants and Methods: 12 young adults (age: 18-22 years) completed progressive maximal exercise testing and a brain MRI scan. During scanning, participants completed three runs of functional MRI (volumes = 619; TR = 800 ms; multiband = 4; voxel size = 3 mm³). During each 8 minute fMRI run, participants completed an exercise challenge consisting of alternating blocks of exercise and rest. Exercise was implemented with a cardiostepper, an MRI-compatible device (similar to a Stairmaster) capable of generating a cardiorespiratory exercise stimulus. During exercise blocks, participants stepped at a rate of 60 Hz with pedal resistance determined by participants' fitness level. Heart rate and respiration data were collected during MRI. fMRI data were processed and analyzed using FMRIB Software Library (FSL). The ARTifact Detection Toolbox (ART) software was also used to identify volumes with significant artifact, and ICA-AROMA was used to remove motion-related BOLD signal components.

Results: During exercise blocks, heart rate increased (mean = 131 beats per minute) compared to rest (mean = 87 beats per minute; $t(34) = 4.3$; $p < .001$). The mean heart rate during exercise blocks corresponds to an exercise intensity in the light to moderate intensity range for this age group. Motion (median framewise displacement) was significantly higher during exercise (mean = .53

mm) than rest (mean = .36 mm). Across all blocks, ART classified 19.8% of brain volumes as artifact-containing outliers, with 69% of the outliers occurring during exercise blocks. Although greater head motion was observed during exercise, the use of ICA-AROMA reduced the impact of motion considerably, recovering an additional 25% of the task-related signal, relative to noise. Comparison of fMRI activity during exercise versus rest revealed significant associations with primary and supplementary motor cortices, hippocampus, and the insula, among other regions.

Conclusions: The current study demonstrates the feasibility of eliciting light to moderate intensity cardiorespiratory exercise (using a lower body stepping exercise) during functional MRI. Although increased head motion was observed during exercise compared to rest, the degree of head motion was roughly approximate to the values published in previous fMRI studies and post image acquisition processing improved task-related signal. During exercise, increased brain activation was observed in regions associated with the central command network, which regulates autonomic nervous system and musculoskeletal function during exercise.

Categories: Neuroimaging

Keyword 1: neuroimaging: functional

Keyword 2: movement

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48 Sex Differences and Longitudinal Changes in White Matter Microstructure in Healthy Older Adults

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Objective: As the global population of older adults increases, it is crucial to study the healthy aging brain. Despite representing approximately 50% of brain tissue, investigations of changes in white matter (WM) have been limited. Given that women outlive men in most populations worldwide, evaluating factors such as sex and gender in the normal aging trajectory are