questionnaires, neuropsychological evaluations, and the NIH toolbox. Predictors included baseline covariates (i.e., age, language of test administration, gender, education, income, self-rated health) and NIH toolbox emotional and instrumental support variables. Outcomes were baseline and longitudinal memory (visual and verbal episodic memory) and executive functioning (verbal fluency and working memory) composites from the Spanish and English Neuropsychological Assessment Scales (SENAS). Latent growth curve models were conducted separately in Black and Hispanic/Latinx participants to estimate effects of emotional and instrumental support on baseline cognition and subsequent change in each domain.

Results: Black participants reported greater emotional support. There were no group differences in levels of instrumental support. Greater instrumental support was associated with better initial memory (standardized β= .194, 95%CI: [.063, .325]) among Black participants but not among Hispanic/Latinx participants. In Hispanic/Latinx participants, greater emotional support was associated with better initial executive functioning (standardized β= .215, 95%CI: [.079, .350]. Emotional support was not associated with either cognitive domain in Black participants. There were no associations between emotional or instrumental support on cognitive change in either group.

Conclusions: Results point to differences between Black and Hispanic/Latinx older adults in the impact of specific aspects of social support on different cognitive domains. Positive associations between instrumental support and baseline memory in Black participants and between emotional support and executive functioning in Hispanic/Latinx participants suggest unique cognitive consequences of social support across groups. Differences in the role of specific types of social supports may be useful in identifying intervention targets specifically for Black and Hispanic/Latinx older adults, who are disproportionately affected by ADRD. Future research will examine these constructs using multiple group models to test these associations more rigorously.

Categories: Aging
Keyword 1: aging disorders
Keyword 2: diversity
Keyword 3: social processes

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18 Regional patterns of mitochondrial function using phosphorus magnetic resonance spectroscopy in older adults at-risk for Alzheimer's disease.

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Objective: The brain is reliant on mitochondria to carry out a host of vital cellular functions (e.g., energy metabolism, respiration, apoptosis) to maintain neuronal integrity. Clinically relevant, dysfunctional mitochondria have been implicated as central to the pathogenesis of Alzheimer's disease (AD). Phosphorous magnetic resonance spectroscopy (31p MRS) is a non-invasive and powerful method for examining in vivo mitochondrial function via high energy phosphates and phospholipid metabolism ratios. At least one prior 31p MRS study found temporal-frontal differences for high energy phosphates in persons with mild AD. The goal of the current study was to examine regional (i.e., frontal, temporal) 31p MRS ratios of mitochondrial function in a sample of older adults at-risk for AD. Given the high energy consumption in temporal lobes (i.e., hippocampus) and preferential age-related changes in frontal structure-function, we predicted 31p MRS ratios of mitochondrial function would be greater in temporal as compared to frontal regions.

Participants and Methods: The current study leveraged baseline neuroimaging data from an ongoing multisite study at the University of Florida and University of Arizona. Participants were older adults with memory complaints and a first-degree family history of AD [N = 70; mean [M] age [years] = 70.9, standard deviation [SD] = 5.1; M education [years] = 16.2, SD = 2.2; M MoCA = 26.5, SD = 2.4; 61.4% female; 91.5% non-latinx white]. To achieve optimal sensitivity,

we used a single voxel method to examine 31p MRS ratios (bilateral prefrontal and left temporal). Mitochondrial function was estimated by computing 5 ratios for each voxel: summed adenosine triphosphate to total pooled phosphorous (ATP/TP; momentary energy), ATP to inorganic phosphate (ATP/Pi; energy consumption), phosphocreatine to ATP (PCr/ATP; energy reserve), phosphocreatine to inorganic phosphate (PCr/Pi; oxidative phosphorylation), and phosphomonoesters to phosphodiesters (PME/PDE; cellular membrane turnover rate). All ratios were corrected for voxel size and cerebrospinal fluid fraction. Separate repeated measures analyses of variance controlling for scanner site differences (RM ANCOVAs) were performed.

Results: 31p MRS ratios were unrelated to demographic characteristics and were not included as additional covariates in analyses. Results of separate RM ANCOVAs revealed all 31p MRS ratios of mitochondrial function were greater in left temporal relative to bilateral prefrontal voxel: ATP/TP ($p < .001$), ATP/Pi ($p = .001$), PCr/ATP ($p = .004$), PCr/Pi ($p = .004$), and PME/PDE ($p = .017$). Effect sizes (partial eta squared) ranged from 0.6-.20.

Conclusions: Consistent and extending one prior study, all 31p MRS ratios of mitochondrial function were greater in temporal as compared to frontal regions in older adults at-risk for AD. This may in part be related to the intrinsically high metabolic rate of the temporal region and preferential age-related changes in frontal structure-function. Alternatively, findings may reflect the influence of unaccounted factors (e.g., hemodynamics, auditory stimulation). Longitudinal study designs may inform whether patterns of mitochondrial function across different brain regions are present early in development, occur across the lifespan, or some combination. In turn, this may inform future studies examining differences in mitochondrial function (as measured using 31p MRS) in AD.

Categories: Aging
Keyword 1: neuroimaging: structural
Keyword 2: frontal lobes
Keyword 3: temporal lobes
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19 Exploring GABA Concentration Changes in Sensorimotor Cortex in Older Adults During Motor & Cognitive Performance

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Objective: Aging is associated with changes in cortical excitability which may affect motor learning and cognitive function via selective modulation of gamma aminobutyric acid (GABA). Previous studies using magnetic resonance spectroscopy (MRS) to measure GABA in older adults found that increased baseline GABA levels in the sensorimotor cortex (M1S1) were associated with better motor performance. GABA levels in M1S1 have tended to decrease during the execution of a repeated motor sequence. The dynamic change in GABA density in M1S1 in older adults is currently unknown and represents a critical gap in our understanding of how it could impact motor learning and cognitive performance. As such, the purpose of the current study is to quantify changes in cortical GABA during motor learning in the aging brain and examine those changes in relation to motor and cognitive performance. We hypothesize that older adults with greater dynamic range in M1S1 GABA levels will display more efficient motor learning and increased cognitive scores.

Participants and Methods: We report on a total of 18 healthy older adults aged 64 to 80 years (M = 70.44, SD = 4.99, 12 females). Using MRS at 3T, we measured changes in GABA concentration in M1S1 at rest, during an eight or