12 finger-movement motor entrainment task, and during a recall task. Gannett was used for GABA quantification relative to water. Change in GABA was calculated by subtracting Rest1 GABA from Recall1 GABA. In a separate session, participants completed a battery of cognitive assessments. We computed linear regressions to examine the relationship between dynamic GABA change, recall accuracy of the motor task and cognitive performance.
Results: In relation to motor performance, we found that both greater baseline (Rest1) GABA levels and greater dynamic change in GABA significantly predicted better recall accuracy on the motor task. For cognitive performance, we found that greater dynamic change in GABA significantly predicted better performance on Word Reading in the Stroop Color and Word Test and Delayed Recall in the Hopkins Verbal Learning Test (HVLT). No additional significant relationships were found for the remaining cognitive assessments.
Conclusions: Older adults who were able to accurately perform the task had a greater dynamic change in GABA and increased baseline GABA levels. These adults with greater dynamic change also had better cognitive performance on HVLT Delay and Stroop Word Reading. This modulation of GABA associated with better performance could be related to changes in neuroplasticity. Although these results are in the preliminary stages, they point to a greater understanding of aging related changes in motor and cognitive performance. We'll continue to explore the relationship between sensory motor performance and changes in GABA concentration as a potential predictor for cognitive performance and future rehabilitation.

Categories: Aging
Keyword 1: cognitive neuroscience
Keyword 2: brain plasticity
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20 The Impact of Perceived Pain on Neural Efficiency During Walking in Older Adults

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Objective: Pain is a mechanism for attention disruption due, in part, to a shared reliance on the prefrontal cortex (PFC). Amongst older adults, the experience of pain is both prevalent and functionally impactful. Dual-task walking (DTW) paradigms are a useful means of assessing the impact of pain on attentional control and known to be sensitive to changes in the cortical hemodynamic response within the PFC. To date, however, few studies have utilized such paradigms to examine the impact of self-reported pain on attentional control via assessment of cognitive, gait and neuroimaging outcomes. Examining these associations would facilitate a better understanding of the ways in which pain may negatively impact neural efficiency, thereby increasing risk of adverse functional outcomes, in healthy aging.
Participants and Methods: Study participants (N= 408; mean age = 76 ± 6.5ys; % female = 55.4) were grouped into pain (n= 266) and no pain (n= 142) groups based upon their responses on the MOS-PSS and MOS-PES. These questionnaires were also used to assess self-reported levels of pain severity and interference amongst individuals with reported pain. Functional near-infrared spectroscopy was used to measure intraindividual variability (IIV) of the cortical hemodynamic response within the PFC during a DTW paradigm which consisted of Single-Task-Walk (STW), Cognitive Interference (Alpha), and Dual-Task-Walk (DTW) conditions. Participants walked along an electronic walkway and quantitative gait data were extracted in order to assess IIV in stride length during STW and DTW conditions. The rate of correct letter generation was used as a measure of cognitive accuracy during Alpha and DTW conditions. Linear mixed effects models (LMEMs) were used to examine the effects of perceived pain on neural and behavioral responses as well as on the change in these outcomes form single- to dual-task conditions. Stratified LMEMs were used to examine whether these associations differed by gender.
Results: LMEMs revealed that perceived pain presence was associated with reduced IIV in PFC oxygenation (estimate = -0.032, p = 0.037) and reduced IIV in stride length in the DTW condition (estimate = -1.180, p = 0.006). High pain severity was associated with a greater

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increase in stride length IIV from STW to DTW (estimate = -1.301, p = 0.039). Stratified LMEMs revealed that the association between pain and neural IIV was significant in only males (estimate = -0.049, p = 0.037), while the association between pain and gait IIV was significant in only females (estimate = -1.712, p = .008).
Conclusions: Study results suggest that self-reported pain over one month is associated with differential patterns of neural and behavioral responding amongst healthy, community-dwelling older adults. Furthermore, it appears that males are more susceptible to the neural effects of pain, while females are more susceptible to the behavioral effects under attention-demanding conditions. In this population, these patterns may reflect a tendency towards inefficient neural and behavioral modifications in response to perceived pain. These findings highlight the need for clinical use of routine pain assessments and, when appropriate, the implementation of timely and effective pain treatments in aging.

Categories: Aging
Keyword 1: chronic pain
Keyword 2: cognitive control
Keyword 3: motor function
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21 Neurocognitive Differences Between Lifestyle Profiles of Women Across the Menopausal Transition

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Objective: Women are at greater risk of developing Alzheimer's disease (AD) than men. The menopausal transition, which involves a neuroendocrine shift, is a potential contributor to this sex difference. Multiple estrogen-regulated systems (i.e., circadian rhythms) are disrupted during this transition which affects cognitive functioning (Barha & Liu-Ambrose, 2020), most notably verbal learning and memory. Little is known about how lifestyle factors (i.e., sleep, physical activity (PA), stress) may promote neurocognitive functioning across this transition (Maki & Weber, 2021). Utilizing data from the Human Connectome Aging project (HCP-A), the current study will examine whether distinct lifestyle profiles including sleep, PA, and stress relate to multiple domains of cognitive performance among a sample of perimenopausal/menopausal women.
Participants and Methods: Perimenopausal/menopausal women (ages 45 to 65) from the HCP-A were included (n =150, M age = 54.6, SD = 5.5). Demographic information, menopausal status, sleep problems (Pittsburgh Sleep Quality Index), PA (International Physical Activity Questionnaire), stress (Distress subscale of the Perceived Stress Scale) were assessed with surveys, and participants completed several lab-based tasks including: dimensional change card sort (DCCS), flanker, pattern recognition processing speed (PS), working memory (WM), picture sequencing, oral reading, Trails Making Test A and B (TMT), and Rey Auditory Verbal Learning (RAVLT) tasks. Using latent profile analysis (LPA), lifestyle profiles were identified via sleep problems, PA, and stress levels. A MANOVA compared cognitive performance between these lifestyle profiles, above and beyond age and education status.
Results: Fit indices indicated that a three-class solution fit the sample best: high PA, low stress and sleep problems (Class 1, n=38), high PA, stress, and sleep problems (Class 2, n= 17), and low PA, high stress and sleep problems (Class 3, n= 95) which were not significantly different based on age or menopausal status ($p>0.05$). A significant multivariate effect of age and education on cognitive performance ($p<.001$) emerged. There was a significant multivariate effect of lifestyle profile on cognitive performance, $F (18, 260) = 1.73$, $p=.034$, eta squared = .11, after controlling for age and education. Univariate analyses determined that certain lifestyle profiles were associated with better performance on all cognitive tasks except verbal memory. Contrary to expectation, Class 3 performed better on TMT A & B, DCCS, flanker, WM, and PS tasks as compared to Class 1. Class 3 performed better on reading and picture sequencing tasks than Class 2. There was no difference in performance between Class 1 and 2.
Conclusions: Results suggest three distinct lifestyle profiles exist in this analytic sample. After controlling for age and education, cognitive performance on all tasks except for verbal memory significantly differed between lifestyle profiles. The profile characterized by low PA and high stress and sleep problems demonstrated superior performance as compared to other

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