2020 Cognitive Aging Conference
2020 Cognitive Aging Conference Schedule

**Wednesday, April 15**

4:00 PM – 6:00 PM  
Conference Registration Begins

**Thursday, April 16**

8:00 AM – 1:00 PM  
Conference Registration
9:00 AM – 12:00 PM  
*Pre-Conference Workshops*
1:00 PM – 1:05 PM  
Welcoming Remarks
1:05 PM – 3:05 PM  
*Symposium Session 1: Motivation-Cognition Interactions*
3:05 PM – 3:30 PM  
Break
3:30 PM – 5:30 PM  
*Poster Session A*
5:30 PM – 6:00 PM  
Break
6:00 PM – 7:00 PM  
*Keynote: The Arousal Hub Region in the Aging Brain (Dr. Mara Mather)*
7:00 PM – 8:30 PM  
Welcome Reception

**Friday, April 17**

8:00 AM – 10:00 AM  
*Symposium Session 2: The Noradrenergic System Shapes Later-Life Neural and Cognitive Development*
10:00 AM – 10:30 AM  
Break
10:30 AM – 12:30 PM  
*Symposium Session 3: Neural Pattern Analysis and Brain Aging*
12:30 PM – 1:00 PM  
Break (Lunch)
1:00 PM – 3:00 PM  
*Poster Session B*
3:00 PM – 4:30 PM  
*Symposium Session 4: Longitudinal Change in Brain Function*
4:30 PM – 5:00 PM  
Break
5:00 PM – 5:30 PM  
*NH/NIA Funding Opportunities, Initiatives and Insights*
5:30 PM – 7:30 PM  
*Poster Session C & Cash Bar*

**Saturday, April 18**

8:00 AM – 10:00 AM  
*Plenary Session 1: Sex & Gender*
10:00 AM – 10:30 AM  
Break
10:30 AM – 12:30 PM  
*Plenary Session 2: Emotion, Cognition, & Self-Regulation*
12:30 PM – 1:00 PM  
Break (Lunch)
1:00 PM – 3:00 PM  
*Poster Session D*
3:00 PM – 5:00 PM  
*Symposium Session 5: Exercise and Cognitive Aging*
5:00 PM – 5:30 PM  
Break
5:30 PM – 7:30 PM  
*Poster Session E & Cash Bar*

**Sunday, April 19**

8:00 AM – 10:00 AM  
*Poster Session F*
10:00 AM – 10:30 AM  
Break
10:30 AM – 12:30 PM  
*Plenary Session 3: Interventions*

[Link to poster abstracts]
Thursday, April 16

Workshop 1: Using Mobile Technology to Administer and Collect Data
Martin Sliwinski, Pennsylvania State University

Abstract: Pervasive mobile technology, such as smartphones, are finding increasing use as data collection tools for researchers. This workshop provides instruction in the use of smartphones for administrating and collecting data from cognitive tests. The workshop will be divided into three sections. First, we will provide a brief overview of benefits and challenges of using mobile technology to assess cognition remotely and in natural (i.e., uncontrolled) environments. In the second part of the workshop, we will provide hands-on instruction in how to use software and testing procedures developed as part of the NIH-funded Mobile Monitoring of Cognitive Change (M2C2) project for delivering and collecting data from mobile devices. And finally, we will provide a more technical tutorial in how to design custom testing procedures via high-level scripting.

*Please note that registration for this workshop has a long waiting list and is currently closed.*

Workshop 2: Separating Vascular and Neural Effects of Aging on fMRI BOLD Data
Kamen A. Tsvetanov, Department of Clinical Neurosciences, University of Cambridge; Department of Psychology, University of Cambridge

Abstract: We are rapidly gaining knowledge about relationships between neural function and cognition, but we still do not understand the mechanisms and the factors by which they break down in aging. Understanding these mechanisms and factors is predicated on accurate identification of brain functional activity and connectivity within and between large-scale functional brain networks. Such substrates of brain function can be estimated from task-based and task-free functional magnetic resonance imaging (fMRI) signal. However, blood-oxygen level-dependent (BOLD) based fMRI is a composite of neural and vascular signals, both of which are differentially affected by aging. It is therefore essential to use approaches to the analysis of fMRI data that distinguish the age effects on vascular health and neural function. Modelling individual and group differences in vascular health in fMRI studies of aging may improve the interpretation of imaging findings and their behavioural relevance towards better understanding of neurocognitive aging.

As fMRI BOLD is the primary tool used for studying neurocognitive aging, familiarity with various methods for the separation of neural and vascular dynamics in fMRI BOLD signal is increasingly important, including those based on normalization and calibration techniques, as well as supervised and unsupervised approaches. In this workshop, we will provide an overview of the methodological aspect of each approach as well as their application to help characterising various aspects of the underlying neural signal with insights into understanding individual differences as well as healthy and unhealthy aging.

Objective: The workshop will introduce attendees to the topic of separating vascular from neural signals in fMRI BOLD data. Upon completion, attendees will gain an appreciation for the various approaches, and their differences, appropriate for modelling vascular and neural signals in fMRI BOLD data. Practical suggestions will be emphasized throughout a hands-on session, including freely available software (e.g. stand-alone or matlab-based SPM), recommendations of best practices, resources for more detailed
information, and sample code. Participants are asked to bring laptops and actively engage with the materials, which will be made available on GitHub prior to the course.

Target audience: The workshop is mainly aimed at researchers working with task-based and task-free fMRI BOLD data to characterise behaviourally relevant estimates of brain functional activity and functional connectivity in the context of neurocognitive aging. In more general, the workshop is relevant to psychologists, neuroscientists and clinicians interested in understanding the potential, limitations, and practical implementations of using fMRI BOLD data to gain insights into understanding individual differences in neural function and the consequences of aging and neurodegeneration.

*Please note that registration for this workshop has a long waiting list and is currently closed.

Thursday, April 16
1:00 PM -- 3:00 PM

Symposium 1: Motivation-Cognition Interactions

Organizer: Julia Spaniol, Ryerson University
Discussant: Thomas M. Hess, North Carolina State University
Keywords: Emotion and Affect, Memory, Decision making, Metacognition, Neuroscience: Functional

Symposium Summary: Thirty years ago, Baltes and Baltes (1990) presented their influential metatheory of lifespan development, selective optimization with compensation (SOC). The SOC framework represented a paradigm shift in cognitive-aging research by highlighting, among other things, the critical role of goals and motivational priorities in successful adaptation to declining neurocognitive resources in aging. The study of motivation-cognition interactions continues to drive theoretical development and empirical advances in cognitive-aging research today. Socioemotional selectivity theory (Carstensen, Isaacowitz, & Charles, 1999), which posits that a shortened time horizon increases the salience of emotion-regulation goals in aging, has informed investigations of the so-called age-related positivity effect (Mather & Carstensen, 2005). Selective engagement theory (Hess, 2014) has guided investigations of age differences in the costs and benefits of cognitive engagement, with particular emphasis on the impact of meaningfulness and goal relevance on task selection, effort, and performance in older adults. At the neurobiological level of analysis, insights about the mechanics of motivation-cognition interactions in aging have come from studies documenting age-related changes in neuromodulators that facilitate goal-directed thought and behavior, including dopamine (Bäckman et al., 2006) and norepinephrine (Mather & Harley, 2016). Finally, a recent surge in research on age-related changes in prosociality – thoughts and actions that benefit others – has added a social dimension to the study of motivation-cognition interactions in aging. The contributions in this symposium represent these complementary themes and levels of analysis. Julia Spaniol will provide an overview of the topic, with particular focus on the relative influence of intrinsic and extrinsic motivation on cognition in aging. Kaoru Nashiro will present new evidence of a causal link between mindfulness and default-network connectivity, a potential neural marker of enhanced emotion regulation in healthy aging. Angela Gutches will present a series of studies examining neural and cognitive mechanisms of self-reference and emotion effects on memory in younger and older adults. Kendra Seaman will present new data on the impact of negative and positive social cues on trust – an aspect of prosociality – across the adult lifespan. Alan Castel will address motivational influences on metamemory in aging, with an emphasis on “responsible remembering” (i.e., selectivity motivated by the fear of forgetting). Lastly, Thomas Hess will discuss theoretical and practical implications of the findings presented in the symposium.
First Presentation: Heart rate oscillation biofeedback reduces default mode network functional connectivity and improves mindfulness

Presenter: Kaoru Nashiro, University of Southern California

Abstract: Socioemotional selectivity theory posits that perceived time remaining in life is a critical aspect of motivation. As we grow older, we focus more on emotionally meaningful goals at the present time rather than future-oriented goals. This shift in motivation is associated with emotional well-being. Similar to older adults, meditators are typically trained to focus attention on the present moment. One of the neural signatures of expert meditators is reduced functional connectivity within the default mode network (DMN), which is associated with less mind wandering and greater emotional health. Additionally, meditators often slow down their breathing, which increases oscillations in heart rate at the breathing frequency. People with greater amplitude oscillations at their breathing frequency tend to have better emotional well-being. The current study (N=100) examined whether five weeks of biofeedback to increase heart rate oscillations while breathing slowly provides some of these critical benefits seen in meditation. Half of the participants received biofeedback to increase heart rate oscillations during practice while the other received biofeedback to decrease heart rate oscillations during practice. The increase-oscillations group showed reduced functional connectivity within the DMN at rest after the intervention whereas the decrease-oscillations group did not. Reductions in DMN were associated with improvement in mindfulness scores. The results raise questions about whether the decreased DMN functional connectivity previously observed in older adults helps promote greater mindfulness and focus on the present moment, or older adults’ greater focus on the present moment contributes to the age differences in DMN.

Authors:
Kaoru Nashiro, University of Southern California
Hyun Joo Yoo, University of Southern California
Jungwon Min, University of Southern California
Christine Cho, University of Southern California
Julian Thayer, University of California, Irvine
Paul Lehrer, Rutgers University
Catie Chang, Vanderbilt University
Tiantian Feng, University of Southern California
Padideh Nasseri, University of Southern California
Shelby Bachman, University of Southern California
Shri Narayanan, University of Southern California
Mara Mather, University of Southern California

Second Presentation: Influences of self-reference and emotion on memory: Shared or separable mechanisms?

Presenter: Angela Gutches, Brandeis University

Abstract: Memory can be enhanced for information that is emotionally valenced or related to the self. The enhancements seem to be preserved with age, such that older adults’ memory benefits to the same extent as younger adults’. Using multiple paradigms, we tested whether memory enhancements from self-referencing and emotional valence stem from a common, shared mechanism that contributes to the
prioritized processing of information. We further tested whether the effects are age-invariant or differ for younger and older adults, including considering potential age differences in the prioritization of positively versus negatively valenced information. These questions have been difficult to answer in previous research, as paradigms typically conflate self-relevance and emotional valence. Our results indicate some separable effects of emotional valence and self-reference, and provide more evidence of age differences than has emerged in previous work. In an fMRI task, both emotional valence and self-reference enhanced memory for younger and older adults. Although there was largely convergence with age in the neural basis of effects of emotion, the neural regions subserving self-reference effects varied more with age. Results from an ERP task also indicated age differences, in that self-referencing enhanced the late positive component (LPP) response for younger adults whereas the effect was not modulated by self-referencing for older adults. Based on these results, emotion and self-reference appear to exert separable effects on cognition. We will discuss the contribution of task demands, and consider whether the joint contributions of self and emotion help to reduce age differences.

Authors:
Angela Gutchess, Brandeis University
Eric C. Fields, Boston College, Brandeis University
Ryan T. Daley, Boston College
Holly J. Bowen, Southern Methodist University
Katelyn R. Parisi, Brandeis University, Boston College
Elizabeth A. Kensinger, Boston College

Third Presentation:  Social associative learning and trust formation across adulthood

Presenter:  Kendra L. Seaman, University of Texas at Dallas

Abstract:  Trust is a key component of social interaction. Older adults, however, often exhibit excessive trust relative to younger adults. One explanation is that older adults may learn to trust differently than younger adults. Specifically, reduced motivation to attend to negative (versus positive) social cues among older versus younger adults could elicit older adults’ excessive trust. However, this learning explanation has not been empirically tested. Here, we report a study examining how younger and older adults learn to trust over time. Participants completed a classic iterative trust game with three partners (15 trials each). On each trial, participants decided how much of an endowment to share with a partner. If shared, the investment was quadrupled. Partners repaid trust by sending back half of the increased sum, or violated trust by keeping it. Partners were trustworthy, neutral, or untrustworthy, repaying 93%, 60%, and 7% of the time, respectively. Younger and older adults shared similar amounts. There were, however, differences in how they shared that money. Compared to younger adults, older adults invested more with untrustworthy partners and less with trustworthy partners. These findings suggest that older adults are less motivated to attend to and learn from negative social cues than younger adults. This leads older adults to trust untrustworthy partners more. At the same time, older adults were more conservative than younger adults toward trustworthy partners, consistent with work showing that they are not always more motivated by positive social cues than younger adults in monetary incentive tasks.

Authors:
Kendra L. Seaman, University of Texas at Dallas
Alexander P. Christensen, UNC Greensboro
Katherine D. Senn, UNC Greensboro
Fourth Presentation: Responsible remembering and the fear of forgetting fuels metamemory in older age

Presenter: Alan D. Castel, University of California, Los Angeles

Abstract: While older adults often face memory challenges, deficits in memory can be overcome through the strategic allocation of attention to important information. Older adults may be strategic about remembering what is most important when they know they are responsible for remembering it. The notion of “responsible remembering” captures how our memory functions to remember what is most important, and metacognitive processes may become well-tuned under conditions that involve responsible remembering in older age. Under certain conditions, older adults can engage in responsible remembering, which involves knowing or predicting what you will and won’t remember. Responsible remembering involves accurate metacognition and self-regulation, which leads to better resolution between thinking you will remember something and actually remembering it. For example, older adults may remember the allergies of a child they are responsible for, but may forget the name of the child’s best friend. The fear of forgetting something critical may also motivate older adults. For example, when packing for a trip, some anxiety may be associated with remembering what is critical. The fear of forgetting some essential item (such as a passport or medications) may lead to effective memory to prevent future forgetting. This may be most pronounced if one has actually experienced the stress of forgetting something critical in the past, events that older adults may remember well. Thus, some fear of forgetting may motivate memory and can lead to responsible remembering in older age.

Authors:
Alan D. Castel, University of California, Los Angeles

Poster Session A
Thursday, April 16
3:30 PM -- 5:30 PM

Keynote Address: The Arousal Hub Region in the Aging Brain

Mara Mather, Leonard Davis School of Gerontology and Department of Psychology, University of Southern California

Abstract: The locus coeruleus (LC) is a brainstem nucleus that receives inputs from a limited set of brain nuclei and brain regions regarding various aspects of arousal (such as stress, emotion, motivation, effort, wakefulness). With its extensive projections that release norepinephrine (NE), the LC then modulates neural processing throughout the rest of the brain depending on current arousal state. Because of challenges in measuring its structure and function in living humans, there has historically been little focus on the LC’s role in determining the fate of cognition in aging. However, in the past few years a growing number of findings suggest that the integrity of the LC-NE system plays a key role in maintaining late life
cognition. Furthermore, LC degeneration can accelerate the progression of Alzheimer’s disease, whereas an intact LC may contribute to cognitive reserve.
Symposium 2: The Noradrenergic System Shapes Later-Life Neural and Cognitive Development

Organizer: Martin J. Dahl, Max Planck Institute for Human Development, Berlin, Germany
Keywords: Neuroscience: Structural, Cognitive Decline, Memory, Attention, Alzheimer's Disease

Symposium Summary: Noradrenergic neuromodulation profoundly influences selective attention and episodic memory, core cognitive functions that decline with proceeding age. Cortical norepinephrine is mainly produced in the locus coeruleus, a brainstem nucleus of only about 15 mm length, but with widespread projections throughout the brain. Recent theories of cognitive aging posit a high susceptibility of noradrenergic neurons to neurodegeneration. In accordance, large post-mortem studies indicate the locus coeruleus as one of the first sites that accumulate aberrant tau, a hallmark of neurodegenerative diseases. The small size and location of the nucleus, however, hampered in-vivo investigations of this structure for a long time. Methodological developments in brainstem magnetic resonance imaging (MRI) now allow inferences about locus coeruleus structural integrity. In addition, recent animal studies suggest a close relation between pupil dilation and locus coeruleus activity.

Building on these recent advancements, we present novel evidence for age-related differences in noradrenergic neuromodulation. Further, we demonstrate a positive relation between age-differences in the locus coeruleus-norepinephrine system and indicators of both brain and cognitive aging. Finally, the clinical relevance of these findings is discussed.

In particular, Kathy Liu (University College London) will present lifespan differences in MRI-indexed locus coeruleus integrity and their functional significance, based on the Cambridge Centre for Ageing and Neuroscience dataset (Cam-CAN; n = 605, aged 18–88 years). Shelby Bachman (University of Southern California) will demonstrate a positive relation between locus coeruleus integrity and cortical thickness in frontoparietal brain regions, based on data of the Berlin Aging Study-II (BASE-II; n = 296). Martin Dahl (Max Planck Institute for Human Development) will show a close link between noradrenergic responsiveness, as assessed by the interplay of arousal-induced pupil dilation and low frequency EEG desynchronization, and age differences in selective attention (n = 77). Finally, Heidi Jacobs (Massachusetts General Hospital/Harvard Medical School) will discuss the associations between locus coeruleus integrity, tau (Flortaucipir-PET), and amyloid (Pittsburg Compound B-PET) using data from the Harvard Aging Brain Study (n = 186; aged 20–95 years) and patient data.

Taken together, the presented studies combine a variety of neuroimaging tools (MRI, PET, EEG, pupil dilation) in large lifespan samples to provide a more holistic picture of how noradrenergic neuromodulation shapes later-life neural and cognitive development.

First Presentation: Locus coeruleus MRI signal intensity and associated cognitive performance across the adult lifespan

Presenter: Kathy Liu, Division of Psychiatry, University College London, UK
Abstract: This presentation will summarize recent insights on age-related differences in the locus coeruleus (LC) using the open-access, population-based Cambridge Centre for Ageing and Neuroscience (Cam-CAN) dataset. This large (N=605), age-continuous (18-88 years) cross-sectional sample of cognitively normal participants allowed us to examine the pattern of lifespan differences in LC MRI signal intensity and their functional significance. We obtained normalized, mean LC signal intensity values, i.e. contrast ratios (CR), from magnetization transfer (MT)-weighted images to investigate the relationship between LC CR and age, and then investigated the functional significance of these observed age-related differences using structural equation modelling. Our findings support the concept that age-related reduction of LC structural integrity (especially the rostral portion) is associated with impaired cognitive and behavioural function. The potential implications of these findings for future in vivo LC studies in ageing and neurodegenerative disorders will be discussed.

Authors:
Kathy Liu, Division of Psychiatry, University College London, UK

Second Presentation: Locus coeruleus integrity is positively related to cortical thickness in older adults

Presenter: Shelby L. Bachman, Davis School of Gerontology, University of Southern California, Los Angeles, CA, USA

Abstract: A growing body of literature has linked the locus coeruleus-norepinephrine (LC-NE) system to later-life cognition. However, less is known about the relationship between the LC-NE system and brain indicators of cognitive aging, such as brain structure. In the present study, we examined the relationship between LC neuronal integrity and cortical thickness in older (n = 229) and younger (n = 67) adults who participated in the Berlin Aging Study-II (https://www.base2.mpg.de). LC integrity was assessed in vivo using neuromelanin-sensitive magnetic resonance imaging (MRI) and was calculated as a contrast between MR signal intensity of the LC and that of neighboring pontine tissue. The Freesurfer software suite was used to extract global and regional measures of cortical thickness and perform vertex-wise analyses of the association between LC integrity and cortical thickness. We found that LC integrity was positively associated with thickness of the entire cortical surface in older but not in younger adults. On a regional level, this association was most prominent in older adults in regions within the frontal, parietal, and occipital cortices. Many of these regions are contained within the frontoparietal network and contribute to cognitive functions such as selective attention and working memory that are subject to strong noradrenergic modulation. These findings offer novel evidence for a link between LC neuronal integrity and brain structure, supporting the notion of a protective role of the LC-NE system in aging.

Authors:
Shelby L. Bachman, University of Southern California
Martin J. Dahl, MPI for Human Development
Markus Werkle-Bergner, MPI for Human Development
S. Düzel, MPI for Human Development
U. Lindenberger, MPI for Human Development
S. Kühn, MPI for Human Development
Mara Mather, University of Southern California
**Third Presentation**: Noradrenergic responsiveness preserves selective attention across the adult lifespan

**Presenter**: Martin J. Dahl, Max Planck Institute for Human Development, Berlin, Germany

**Abstract**: Selectively attending to relevant information while blocking out distractors is crucial for goal-directed behavior, yet with advancing age, deficits emerge in attentional selectivity. Decrements in attention have been associated with altered noradrenergic activity in animals. However, research linking noradrenergic functioning to attention in aging humans is scarce, likely reflecting long-standing methodological challenges in non-invasive assessments. We studied whether age-related differences in the noradrenergic system predict differences in attention. We measured pupil dilation, a non-invasive marker of phasic norepinephrine (NE) release, while concurrently recording the electroencephalogram (EEG), of younger (N=39♂; 25.2±3.2 years) and older adults (N=38♂; 70.6±2.7 years). NE release was triggered on a trial-by-trial basis using fear-conditioned (CS+) stimuli. During conditioning, pupil and EEG markers related to heightened NE activity were identified. Afterwards, in a dichotic listening task, participants were cued to direct attention to either the left or right ear while highly similar syllable pairs were presented simultaneously to both ears.

During the dichotic listening task, presentation of fear-conditioned stimuli reinstated the acquired fear response, as reflected in pupil and EEG alpha–beta-band responses. Critically, pupil dilation to CS+ was correlated with stronger EEG alpha–beta desynchronization, suggesting a common dependence on NE release. On a behavioral level, NE release facilitated attention. In particular, structural equation modeling revealed that the responsiveness of the NE system is associated with attention on a latent construct level, measured by several indicator tasks. Overall, our results suggest that the responsiveness of the NE system supports attention across the lifespan.

**Authors**:
Martin J. Dahl, MPI for Human Development  
Mara Mather, University of Southern California  
Myriam C. Sander, MPI for Human Development  
Markus Werkle-Bergner, MPI for Human Development

**Fourth Presentation**: Elucidating the role of the locus coeruleus in Alzheimer’s disease from an aging perspective

**Presenter**: Heidi IL Jacobs, Division of Nuclear Medicine and Molecular Imaging, Department of Radiology, Mass. General Hospital/Harvard Medical School

**Abstract**: The key pathological hallmarks of Alzheimer’s disease are amyloid-beta and tau accumulation. These proteinopathies start to accumulate decades prior to the first clinical symptoms. In fact, autopsy studies reported that the locus coeruleus is the first site accumulating tau pathology and approximately 80-90% of the 40-year old cases show tau pathology in this brainstem nucleus. Visualizing tau pathology in the locus coeruleus is currently impossible, because of its small size, and the off-target binding of the tau-tracers to neuromelanin and iron. However, locus coeruleus integrity can be quantified using dedicated brainstem MRI methods.
In this talk, I will present data from individuals along the entire lifespan (20-95 years) and show the intricate relationships between locus coeruleus integrity and age. To disentangle the age-related variability in locus coeruleus integrity, the specific anatomic pattern between tau (Flortaucipir-PET), amyloid (Pittsburg Compound B-PET) and locus coeruleus integrity will be discussed using data from the Harvard Aging Brain Study (age 20-95 years) and patient data. Finally, the clinical relevance of these findings will be discussed by relating locus coeruleus integrity to cross-sectional and longitudinal cognitive measures.

Authors:
Heidi IL Jacobs, Massgeneral/Harvard Medical School
John A Becker, Massgeneral/Harvard Medical School
Kenneth Kwong, Massgeneral/Harvard Medical School
Kathryn V Papp, Harvard Medical School
F.d’O. Uquillas, Massgeneral/Harvard Medical School
R.A Sperling, Massgeneral/Harvard Medical School
K.A Johnson, Massgeneral/Harvard Medical School

Friday, April 17
10:30 AM -- 12:30 PM

Symposium 3: Neural Pattern Analysis and Brain Aging

Organizer: Michael D. Rugg, University of Texas at Dallas
Discussant: Michael D. Rugg, University of Texas at Dallas
Keywords: Neuroimaging: Functional

Symposium Summary: Multivariate analysis methods (‘neural pattern analysis’) are widely used to make inferences about the informational content of stimulus- and task-related neural activity acquired with non-invasive methods such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG). Findings from this approach have led to substantial advances in understanding the neural bases of the representation, selection and retrieval of perceptual and conceptual information. Recently, neural pattern analysis has begun to be employed to examine how perceptual and mnemonic processing differ across the healthy adult lifespan, with a particular emphasis on whether age-related cognitive decline might, in part, be attributable to a reduction in the specificity of perceptual and conceptual representations. The present symposium comprises four presentations by investigators at the forefront of the application of neural pattern analysis to address this issue and highlights the utility and promise of the approach in addressing long-standing issues in cognitive aging.

Dr Dennis will describe an fMRI study in which pattern classification was employed to index specificity of retrieved mnemonic representations. While specificity (at both perceptual and conceptual levels) of retrieved information was age-invariant in several neural regions, an age-related reduction in perceptual specificity was evident in midline occipital cortex. Dr Dennis will also report data suggesting that specificity of retrieved information can be enhanced by cognitive training. Dr Duarte will describe studies in which multivariate analysis of EEG data was employed to examine whether the ability to segregate task-relevant and task-irrelevant contextual features during encoding and retrieval differs with age. The findings show that older adults are more likely to ‘bind’ relevant and irrelevant features together at encoding and are less able to use retrieved contextual information to guide memory judgments. Dr Sander will describe findings from an fMRI study that examined age differences in neural selectivity for different perceptual
categories (faces and scenes). While selectivity was diminished in older adults (‘age-related neural dedifferentiation’), this was not accompanied by age differences in the stability of the neural patterns elicited by individual exemplars, or of the patterns shared by the exemplars belonging to a given category. Dr Trelle will present data from a study investigating individual differences in episodic memory in older adults using multivariate fMRI indices of cortical reinstatement and Tau PET imaging. The findings provide evidence for contributions of age-related decline in hippocampally-mediated cortical reinstatement, and hippocampal Tau accumulation, to individual differences in episodic memory.

First Presentation: Age deficits in neural discriminability and its relationship to memory

Presenter: Nancy A. Dennis, Pennsylvania State University

Abstract: Age-related memory deficits are due, in part, to older adults’ difficulties in discriminating between old and new information. Using pattern classification analyses we tested whether this deficit arises from lack of specificity in the sensory representations during memory retrieval, and how this neural discriminability in the ventral visual cortex relates to memory discriminability. We found that patterns of activation across several regions within ventral visual cortex distinguished between targets and lures when they differed in both perceptual and semantic details. While only neural patterns within the midline occipital cortex distinguished targets from lures when they differed only in perceptual details, this discriminability was reduced in older adults. With respect to the relationship between neural discriminability and behavioral discriminability, we found that while several regions showed an age invariant relationship between these metrics, age moderated this relationship in other visual regions. Results suggest that activation patterns within these regions may represent different types of information in each age group. I will also present evidence that the distinctiveness of neural patterns underlying targets and lures can be modified by cognitive training aimed at enhancing retrieval monitoring. Finally, our work has found that while older adults exhibit a deficit in recapitulating encoded information during retrieval (as indexed by reinstatement of neural patterns from encoding at retrieval), this reduction in encoding-retrieval similarity is moderated by age deficits in baseline processing of information. Together our results suggest that neural discriminability underlies memory discriminability in certain instances.

Authors:
Nancy A. Dennis, Pennsylvania State University

Second Presentation: Using pattern analysis to track interference in episodic memory across the adult lifespan

Presenter: Audrey Duarte, Georgia Institute of Technology

Abstract: Abundant behavioral evidence suggests that aging is associated with increased susceptibility to environmental interference, which can manifest as reduced attention toward relevant information and increased attention toward irrelevant information. Emerging results from our lab shows that this susceptibility contributes to age-related episodic memory impairments, including increased memory for distracting information, so-called “hyper-binding,” and reduced overall memory confidence. Using univariate analyses combined with event-related potentials, we have shown that when “to-be-ignored” distracting context features (e.g. colors, scenes) are present during encoding of relevant ones, older adults
Rely on enhanced recruitment of episodic reconstruction processes to support memory judgments. But univariate approaches alone cannot elucidate how attention is distributed during episodic learning, and the extent to which distracting context features impact the quality of recovered memories. I will present results from several projects in which we applied multivariate pattern analyses (MVPA) to oscillatory EEG measured during episodic learning and retrieval in adults across the lifespan to track real-time dynamic fluctuations in the strength of encoding and reactivation of relevant and irrelevant context memory representations. Results show that with age, fluctuations of attention between relevant and irrelevant context features during encoding contribute to age-related increases in hyper-binding and reduced context memory accuracy. During retrieval, although the level of reactivation of relevant context features is age-invariant, only young adults effectively use this information to accurately reject new context features, consistent with a “recall-to-reject” impairment. These results are the first direct evidence that age-related reductions in the ability to ignore distracting information during learning and difficulty using recovered memories to support memory decisions contribute to age-related episodic memory declines across the adult lifespan.

Authors:
Audrey Duarte, Georgia Institute of Technology

Third Presentation: Contributions of neural specificity and pattern stability to memory performance in younger and older adults

Presenter: Myriam Sander, Max Planck Institute for Human Development

Abstract: Loss of neural specificity has been suggested to underlie cognitive aging. However, only few studies have provided evidence for a link between the quality of neural information representation and memory performance so far. In a functional magnetic resonance imaging paradigm, 40 young (YA) and 41 older adults (OA) performed an incidental encoding task with faces, houses, and scrambled pictures. Stimuli were presented twice and participants’ memory was tested in a surprise recognition task. Using a univariate approach, we operationalized neural distinctiveness as the difference in neural activity between the preferred and non-preferred category in face- and house-selective clusters. Distinctiveness scores were reduced in OA and showed an age-independent relation to memory performance. We then characterized neural specificity as the magnitude of the repetition suppression from first to second encoding. Repetition suppression was specific for the preferred category in YA, but not in OA, thus confirming neural dedifferentiation. Finally, we used representational similarity analyses to assess (a) neural pattern stability across repeated exposures and (b) pattern similarity of different exemplars within and between categories. Within-category similarity was higher than between-category similarity in both groups, with no age differences in between-category similarity. Pattern stability did not differ between age groups either and was related to memory performance independent of age. Subsequent memory analyses will further elucidate the relation to memory performance. Our results suggest both age-dependent and age-invariant associations of neural information representation with memory performance and highlight that neural pattern analysis can enhance our understanding of episodic memory decline with age.

Authors:
Myriam Sander, Max Planck Institute for Human Development
Verena R. Sommer, Max Planck Institute for Human Development
Malte Kobelt, Max Planck Institute for Human Development
Fourth Presentation: Neurocognitive and disease-related mechanisms underlying individual differences in episodic memory in cognitively normal older adults

Presenter: Alexandra N. Trelle, Stanford University

Abstract: An emerging goal of cognitive aging research is to understand the contribution of early disease processes to age-related decline in episodic memory. The present investigation combines multivoxel pattern analysis of fMRI data with PET imaging to explore the impact of tau accumulation on individual differences in neural and behavioural indices of hippocampal-dependent memory. Participants were 100 cognitively normal older adults (aged 60-82 years) enrolled in the Stanford Aging and Memory Study (SAMS). Participants completed task-based fMRI to measure hippocampal-pattern completion during associative cued recall, yielding univariate estimates of hippocampal activity and multivoxel pattern estimates of cortical reinstatement. Thirty-six participants (aged 60-79) were additionally scanned with 18F-Pi2620 PET to measure focal tau accumulation in the hippocampus. Episodic memory was assayed using two hippocampal-dependent tests: 1) associative memory for word-image pairs (associative d’), and 2) mnemonic discrimination of studied objects from perceptually similar lure objects (lure discrimination d’). Trial-wise neural estimates of pattern completion – hippocampal activity and reinstatement strength – were correlated, and further independently predicted successful associative memory retrieval. Subject-level neural estimates of pattern completion explained significant variance in both associative d’ and lure discrimination d’, independent of age. Hippocampal tau was negatively related to associative d’ and lure discrimination d’, as well as hippocampal activity and reinstatement strength during memory retrieval. These results suggest that Tau accumulation in the hippocampus contributes to individual differences in episodic memory in cognitively normal older adults, perhaps by disrupting core hippocampal computations such as pattern completion.

Authors:
Alexandra N. Trelle, Stanford University

Poster Session B
1:00 PM -- 3:00 PM

Symposium 4: Longitudinal Change in Brain Function

Organizer: Kristen Kennedy, University of Texas at Dallas, Center for Vital Longevity
Discussant: Naftali Raz, Wayne State University
Keywords: Longitudinal, Neuroimaging: Functional, Methods, Cognitive Decline, Cognitive Control

Symposium Summary: Changes in cognitive performance and static measures of brain structures, measured via longitudinal designs have begun to coalesce into a coherent story of relative decline and preservation, with cross-sectional estimates often mis-representing longitudinal findings. For measures of brain function, especially task-evoked functional MRI, there is a paucity of longitudinal change as these
studies are just beginning to emerge. The intent of this symposium is to pull together studies that show within-person change in functional BOLD activations/deactivations, networks, and task-free network segregation over time in lifespan and older adult samples. The presentations comprising this symposium seek to begin to characterize the nature of change in brain activity to task over time (in terms of activated regions, deactivated regions, and within-person increases or decreases), changes in network segregation changes at rest over time, compare and contrast these within-person findings to known cross-sectional patterns of age-related differences in brain function, and to yoke the nature of the within-person brain function changes to cognitive performance to better understand if these changes are beneficial or detrimental to cognitive aging. While not a specific focus of the symposium, an additional benefit from these presentations will be to observe an array of methodological approaches to measuring within-person fMRI change, and area much in need of advancement and standardization. The presentations will cover fMRI tasks that span a broad range of cognitive domains, methodological approaches, and age-ranges. Christian Habeck will present change data across activation patterns among multiple networks spanning several cognitive tasks and compare these change patterns to cross-sectional age patterns. Kristen Kennedy will present within-person change in activation and deactivation to increasing cognitive difficulty in two fMRI tasks, compare similarities and differences across tasks, and note how these changes relate to cognitive performance and/or change in performance over time. Finally, Alireza Salami will present data on three occasion network segregation change and modulation by DA, measured via PET imaging.

First Presentation: Longitudinal and cross-sectional network-cognition relations in the Reference Ability Neural Network (RANN) study

Presenter: Christian Habeck, Columbia University

Abstract: The Reference Ability Neural Network study (Habeck et al. 2018) is an ongoing study that investigates cognitive aging with fMRI. Participants aged 20-80 perform 12 cognitive tasks every 5 years, covering the domains of episodic memory, fluid reasoning, perceptual speed, and vocabulary. Previous cross-sectional analyses in 255 participants identified 4 activation patterns specific to each cognitive domain, whose expression levels also correlated with cognitive performance. With the first wave of follow-up we investigated whether these baseline cross-sectional brain-behavioral relationships are also conserved longitudinally by projecting the derived networks onto the follow-up data. We focused on the memory (Logical Memory, Word Order, Pairs Associates) and reasoning (Matrix Reasoning, Letter Sets, Paper Folding) tasks. 76 participants had data at both time points, enabling a test of the cross-sectionally derived memory and reasoning networks. For the memory tasks, we found that the earlier derived network showed significant cross-sectional relationship with cognitive performance at both time points. Further, network-expression changes for the 76 repeaters were associated with task-performance changes for all 3 tasks. For the reasoning tasks, this congruent cross-sectional and longitudinal behavior could only be observed for Letter Sets. We conducted separate cross-sectional analyses of both time points in the repeaters for the Paper-Folding task only to understand topographic network changes with aging and repeated task exposure. Robust loadings were found to a strikingly greater degree at the follow-up time point; furthermore, both negative and positive loadings shifted from frontotemporal locations in the baseline pattern to occipitotemporal locations in the follow-up pattern.

Authors:
Christian Habeck, Columbia University
Yaakov Stern, Columbia University
Second Presentation: Longitudinal evidence for reduced functional segregation in aging: Links to cognition and dopamine availability

Presenter: Alireza Salami, Umea University, Karolinska Institute

Abstract: Aging is associated with cognitive decline and concomitant alterations in functional modular organization of the brain. Cross-sectional studies have shown age-related differences in functional segregation, suggesting decreased specialization in brain function with advancing age. Less is known about molecular factors contributing to individual differences in segregation. Given extensive dopaminergic innervations throughout the brain as well as the enhancing effect of dopamine (DA) on neuronal specificity, individual difference in DA availability may be linked to differences in functional segregation. Additionally, longitudinal evidence on age-related changes in functional segregation, onset of such changes, and their implications for cognition is scarce. Using a graph-theoretical framework of resting-state fMRI from two independent large-scale studies (BETULA: n = 612, baseline age: 25-80 years; three measurement occasions; COBRA: n=172; baseline age: 63-67 years), we found non-linear changes in segregation as a function of age, such that individuals older than 60 years showed exacerbated reductions in segregation. Greater segregation was associated with a superior global cognitive ability (a composite of episodic memory, working memory, and processing speed) across both datasets, but no change-change association was observed. Finally, individuals with greater DA D2 availability showed higher segregation, suggesting that DA boosts the distinctiveness of neural representations. Collectively, these studies provide evidence for reductions in functional segregation in aging that relate to cognitive functioning and that may be linked to integrity of the DA system.

Authors: Alireza Salami, Umea University, Karolinska Institute
Lars Nyberg, Umea University, Karolinska Institute

Third Presentation: Four Year Longitudinal Change in Task-Related Functional Activation across the Adult Lifespan

Presenter: Kristen Kennedy, University of Texas at Dallas

Abstract: Substantial brain changes occur across the adult lifespan, especially into older age. While age differences in BOLD activation have been identified cross-sectionally, there remains little research on longitudinal, within-person changes in task-related fMRI activation and deactivation. Here, we examined BOLD response change across a 4-year lag in a lifespan sample of healthy adults (20-94; N=94). Functional MRI was collected during two tasks: a digit n-back task (0-, 2-, 3-, 4-back) and a spatial distance judgement (control, easy, medium, difficult) task. Subject-specific templates were created for each subject, coregistering both waves, and a sample-specific group template was created representing all participants. Within each wave, functional images were realigned and coregistered to each individual’s subject-specific template, and then transformed into the sample-specific group template and smoothed. Fixed effects were estimated for each difficulty level, wave, and participant. At the group level, a linear mixed-effects model was estimated at each voxel using AFNI’s 3dLME, including random effects of participant and difficulty. Models indicated several contrasts of interest were significant for both tasks, including Age x Time and Difficulty x Age interactions in both subcortical (striatal, thalamic, midbrain, cerebellar) and cortical (cingulate, parietal, temporal) brain regions. Overall task activation changed over 4-years and level of change depended on participant’s initial age. Furthermore, modulation of activation to increasing
difficulty depended on the participant’s initial age. These results across two independent paradigms suggest that task-related BOLD activation is sensitive to four-year longitudinal aging, whereas BOLD modulation to difficulty is sensitive to baseline cross-sectional age.

Authors:
Kristen Kennedy, University of Texas at Dallas
Chris Foster, University of Texas at Dallas
Christina Webb, University of Texas at Dallas
Ekarin Pongpipat, University of Texas at Dallas
Maria Boylan, University of Texas at Dallas
Karen Rodrigue, University of Texas at Dallas

Friday, April 17
5:00 PM -- 5:30 PM

NIH/NIA Symposium: NIH/NIA Funding Opportunities, Initiatives and Insights

Organizer: Dana Plude, NIH National Institute on Aging

Symposium Summary: This symposium provides an overview of recent funding opportunity announcements (FOAs) and notices of special interest (NOSIs) from a panel of Program Directors at the National Institute on Aging. Dr. Dana Plude, Deputy Director in the Division of Behavioral and Social Research (DBSR) will provide an overview of NIA extramural activities including its use of FOAs and NOSIs for stimulating research in targeted areas. Dr. Jon King, Program Director in the Individual Behavioral Processes Branch within BSR, will outline recent funding initiatives related to cognitive aging (including population-level and behavioral-genetics research). And, Dr. Molly Wagster, Chief of the Behavioral and Systems Neuroscience Branch within the Division of Neuroscience, will outline neuroscience-oriented initiatives related to cognitive aging and cognitive impairment (AD/ADRD).

First Presentation: NIA Budget Growth, Funding Opportunities for Research in Aging

Presenter: Dr. Dana Plude, Deputy Director, Division of Behavioral and Social Research, NIA

Abstract: The NIA budget has grown dramatically over the past several years, in part due to the bipartisan support of the US Congress for the National Institutes of Health overall and in part due to a targeted increase in funding specifically addressing Alzheimer’s disease (AD) and AD-related dementias (ADRD). This growth has prompted a diverse set of funding opportunities for research in aging not only for projects addressing AD/ADRD but projects addressing normative aging as well. NIA has initiated funding opportunities across a range of ‘activity codes’ using conventional funding opportunity announcements (FOAs) as well as so-called “Notices of Special Interest” (NOSIs).

Second Presentation: Funding Opportunities and Initiatives in the Division of Behavioral and Social Research

Presenter: Dr. Jonathan King, Program Director, Individual Behavioral Processes Branch, NIA/BSR
Abstract: The Division of Behavioral and Social Research (BSR) supports social, behavioral, and economic research and training on the processes of aging at the individual and societal levels. BSR fosters cross-disciplinary research, from genetics to cross-national comparative research, and at stages from basic through translational. BSR supports a wide range of research in cognitive aging, including research on cognitive interventions, cognitive epidemiology and molecular and behavior genetics. BSR has also worked with other units within and outside of NIA to promote new initiatives related to remediating age-related cognitive decline and fostering behavioral economic approaches to behavior change. BSR also supports large-scale, population-based studies such as the Health and Retirement Study (HRS) and various centers and networks that also support aging-focused research. Specific initiatives such as the Healthy Cognitive Aging Project and the Harmonized Cognitive Assessment Protocol will be outlined.

Third Presentation: Funding Opportunities and Initiatives in the Division of Neuroscience

Presenter: Dr. Molly Wagster, Chief of the Behavioral and Systems Neuroscience Branch in the Division of Neuroscience, NIA

Abstract: The Division of Neuroscience (DN) fosters and supports extramural research and training to better understand the neural and behavioral processes associated with the normally aging brain, with a particular focus on dementias of older age. The Behavioral and Systems Neuroscience Branch focuses on research in cognitive and emotional change with age and in sensory and motor disorders of aging. This includes research focused on neural mechanisms of cognitive (memory, learning, attention, language) and affective (emotion) change with age, spanning molecules to behavior, and including a wide range of approaches from basic neuroscience to epidemiology and interventions. The presentation will provide information about research opportunities for students and early career as well as more senior scientists. Updates about the NIH Toolbox® and research initiatives stemming from the Cognitive Aging Summit III, and the AD/ADRD research agenda will be provided.

Poster Session C

Friday, April 17
5:30 PM -- 7:30 PM
Plenary 1: Sex & Gender

Overview Speaker: Susan Resnick, Laboratory of Behavioral Neuroscience, National Institutes of Health

First Presentation: Males with Parkinson's May Experience Greater Disease Burden in Aspects Of Cognitive And Psychosocial Function than Women

Presenter: Allison A Bay, Emory University
Keywords: Cognitive Decline, Parkinson's Disease, Executive Function, Visuo-Spatial Abilities, Attention

Abstract: Background: Parkinson's Disease (PD) symptoms and severity may differ between males and females, with males suffering from higher rates of memory and cognitive decline, executive functions and motor skills and an earlier manifestation of the disease but experiencing better quality of life compared to females. Identifying specific differences could lead to sex-tailored treatment and improved treatment outcomes for people with PD.

Methods: Retrospective, secondary analyses were performed on data collected from studies, conducted 2011 – 2019, that assessed motor, cognitive and psychosocial function in 199 people diagnosed with PD (females=72). Data were assessed for normality. We compared performance on outcome variables using univariate analyses, adjusting for age, housing type and years of education.

Results: Patients had mild-moderate PD (Hoehn and Yahr Stage Mdn= 2, IQR=.5), were 69.1(8.9) years old and had PD 6.6(4.6) years. Groups were not different in ability to perform activities of daily living (composite physical function index: 19 (5.1)) Males gave more correct answers while counting backwards by 3s, (8.8 ± 4.03 versus 6.4 ± 3.65 ; p<.001) but sexes did not differ in percent correct. Men exhibited more impairment in non-motor experiences of daily living (MDS-UPDRS-I, 13.4 ± 7.64 vs. 10.7 ± 7.27; p=.013), motor experiences of daily living (MDS-UPDRS-II 16.9 ± 8.87 vs. 10.6 ± 7.07;p<.001) and motor symptoms (MDS-UPDRS-III, 34.1 ± 12.14 vs. 31.8 ± 12.16; p=.014). Men performed worse at tasks of inhibition (Color Word Interference task, 6.4 ± 4.61 vs. 7.8 ± 5.03;p=.014) but made fewer errors on inhibition/switching (7 ± 3.87 vs.7.8 ± 4.4; p=.05) and were more depressed (Beck Depression Inventory: 12.5 ± 8.91 vs. 9.4 ± 7.77; p=.016). No differences in spatial cognition were noted. Conclusion: Males were more depressed, performed worse in motor and cognitive functions and were more impaired in non-motor and motor experiences of daily living and motor symptoms of PD than females. Sex-tailored therapies in these motor, cognitive, and disease-specific domains may reduce differences in performance between men and women, leading to better PD treatment outcomes for everyone.

Authors:
Allison Bay, Emory University
Eeshani Singh, Emory University
Ella Leeth, Emory University
Liang Ni, Emory University
Ariyana Bozorg, Emory University
Ariel Hart, Emory University
Second Presentation: Associations among latent factors of metabolic risk, brain volume, and cognition in old age differ by sex

Presenter: Sandra Duzel, Max-Planck-Institute for Human Research
Keywords: Neuroscience: Structural, Episodic Memory, Working Memory, Methods, Individual Differences

Abstract: Metabolic syndrome (MetS) refers to risk factors for cardiovascular disease associated with reduced physical fitness, higher disease burden, and impaired cognitive functions. Available evidence indicates that metabolic functioning is related to brain structure at the level of specific indicators, such as hypertension and voxel-based morphometry, respectively. However, attempts to relate metabolic risk brain morphology at the construct level using structural equation modeling are scarce. Here, we used confirmatory factor analysis to: (a) examine associations among latent factors of metabolic risk, regional grey-matter integrity (GMI), and cognition; (b) test whether these associations differ by sex. Analyses were based on a sample of 1,532 healthy adults (52% female) aged 60 to 88 years from the Berlin Aging Study II, and included MRI data for a subsample of 341 (37% female) individuals. Metabolic risk was defined by waist circumference, triglycerides, fasting blood glucose, and high-density lipoprotein; regional GMI by mean diffusivity, magnetization ratio transfer ratio, and VBM-based volume estimates; and cognition by three tasks for each ability. Initial analyses indicate that individuals with lower metabolic risk show greater GMI in prefrontal cortex. Also, in the male subgroup, greater prefrontal GMI was associated with higher fluid intelligence and working memory. We highlight the benefits of latent factors for establishing brain-behavior relations, and discuss putative physiological substrates of individual differences in GMI.

Authors:
Sandra Duzel, MPI Berlin
Johanna Drewelies, HU Berlin
Andreas Brandmaier
Ulman Lindenberger
Simone Kühn

Third Presentation: Spatial Mnemonic Similarity Task Performance is Associated with Sex, Age, and Hippocampal Subfield Volume Differences

Presenter: Chris M Foster, University of Texas at Dallas
Keywords: Episodic Memory, Hippocampus, Neuroscience: Structural, Spatial Memory, Pattern Separation

Abstract: The ability to encode and retrieve episodic memories relies on medial temporal lobe (MTL) cortices and subfields of the hippocampal formation. Despite understanding of the neurobiological circuitry of this system in supporting mnemonic discrimination and episodic memory, literature exploring the association between aging of MTL volumes and mnemonic discrimination is sparse. Additionally,
recent evidence suggests that mnemonic discrimination is sensitive to sex differences, which may be a product of differences in neurogenesis, a process confined to the dentate/CA subfields. Thus, in an adult lifespan sample of 83 healthy adults (24-98 years old), the current study utilized a spatial Mnemonic Similarity Task, thought to tax pattern separation, to investigate the effects of age, sex, and MTL volumes on discrimination performance across three increasing levels of spatial similarity. Mixed effects models with random intercepts and slopes across levels of similarity were conducted for each MTL volume (subiculum, CA1/2, CA3/DG, ERC), along with interactions with age and sex. For CA1/2 and CA3/DG, but not subiculum or ERC, significant similarity slope x volume x sex interactions were found (p’s < .036). Results revealed that larger volumes were associated with better discrimination across levels of similarity, selectively for women. These findings lend support to the notion that HC subfields, particularly dentate and CA1-3, support pattern separation and completion. Interestingly, these results suggest that preservation of HC volume may enhance mnemonic discrimination performance in women across the lifespan. Further, these results capture sex specific processes that may work to support high fidelity episodic memory.

Authors:
Chris M. Foster, University of Texas at Dallas
Kristen M. Kennedy, University of Texas at Dallas
Karen M. Rodrigue, University of Texas at Dallas

Fourth Presentation: Gender Differences in Brain Morphology, Function and Blood Flow in the Cognitively Normal Oldest Old from McKnight Brain Aging Registry

Presenter: Noam Alperin, University of Miami
Keywords: Neuroimaging: Functional

Abstract: Females have smaller brains than males, regardless, their cognitive performance is similar. We investigated gender-related differences in brain morphology, cerebral blood flow (CBF), cognitive performance, and functional connectivity in cognitively intact oldest-old subjects to document gender-related differences in regional brain volume, cortical thickness, and functional-connectivity. We further looked at the coupling between GM and WM volumes, total CBF (tCBF) and cognitive performance (MoCA scores).

Participants were part of the McKnight Brain Aging Registry study conducted at the four McKnight Institutes. 121 participants (71 females, 50 males, age 85-99) were included. Brain parcelation was done using FreeSurfer. Functional connectivity was calculated as correlation coefficients between activities of distinct brain regions. Graf-based efficiency and modularity were used to assess brain organization. tCBF was measured using velocity-encoded MRI. Effective whole brain perfusion was derived by the tCBF divided by weighted brain mass.

Females had significantly larger intracranial volume (ICV), GM and WM volumes, greater normalized volumes in 18 and 6 regions when normalized with ICV and brain tissue volume, respectively, and greater cortical thickness in 10 regions. Females had stronger connectivity within DMN, whereas males had stronger connectivity in SMN and higher activity within VN. Females had higher modularity than males. tCBF was similar between genders, but effective perfusion was larger in females. However, tCBF was significantly correlated with MoCA scores in females but not in males. Is the female brain more efficient?
Authors:
Noam Alperin, University of Miami
Che Liu, University of Miami
Sang Lee, University of Miami
Ron Cohen, University of Florida
Gene Alexander, University of Alabama
Tatjana Rundek, University of Miami

Saturday, April 18
10:30 AM – 12:30 PM

Plenary 2: Emotion, Cognition, & Self-Regulation

Overview Speaker: Derek Isaacowitz, Northeastern University

First Presentation: Emotion, Cognition, and Aging: A Strategy Approach

Presenter: Patrick Lemaire, Aix-Marseille University, CNRS
Keywords: Emotion and Affect, Problem Solving, Strategy Use

Abstract: Previous studies found that emotions affect cognitive performance and that effects of emotion on cognition sometimes change with age during adulthood, and sometimes are the same in young and older adults. Unknown are the mechanisms underlying effects of emotion on cognition and how these effects change during aging. I shall report a series of experiments that address these issues. Cognitive tasks were arithmetic problem solving tasks that participants accomplished in neutral or negative emotional states. Thus, participants had to give sums of two-digit addends (46+57), and which strategy was used on each problem was assessed, in addition to performance. In another set of experiments, participants were asked to provide estimates of two-digits multiplication problems (34x86) without calculating the exact products. They had to select the best of available strategies on each problem under emotional or neutral conditions. In yet another experiment, strategy execution was investigated while controlling for other strategy dimensions when participants were asked to accomplish computational estimation tasks. Data document how emotions influence strategy repertoire (i.e., which and how many strategies participants use), strategy distribution (i.e., how often each strategy is used), strategy execution (i.e., strategy performance), and strategy selection (i.e., how participants choose among strategies on each item). Data also document age-related differences and similarities in strategic changes as a function of emotions. All in all, these findings show the usefulness of a strategy approach to understand effects of emotion on cognition and how these effects change during aging.

Authors:
Patrick Lemaire, Aix-Marseille University & CNRS

Second Presentation: Oxytocin may facilitate neural recruitment in medial prefrontal cortex and superior temporal gyrus during emotion recognition in young but not older adults

Presenter: Diana S. Cortes, Stockholm University
Keywords: Oxytocin, Emotion and Affect, Neuroimaging: Functional, Social Cognition, Modality
Abstract: Normal adult aging is associated with decline in some socioemotional abilities, such as the ability to recognize emotions in others, and age-related neurobiological processes may contribute to these deficits. There is increasing evidence that the neuropeptide oxytocin plays a key role in social cognition, including emotion recognition. The mechanisms through which oxytocin promotes emotion recognition are not well understood yet, and particularly in aging. In a randomized, double-blind, placebo-controlled within-subjects design, we investigated the extent to which a single dose of 40 IU of intranasal oxytocin facilitates emotion recognition in 40 younger (M = 24.90 yrs., SD = 2.97, 48% women) and 40 older (M = 69.70 yrs., SD = 2.99, 55% women) men and women. During two fMRI sessions, participants viewed dynamic positive and negative emotional displays. Preliminary analyses show that younger participants recognized positive and negative emotions more accurately than older participants (p < .001), with this behavioral effect not modulated by oxytocin. In the brain data, however, we found an age x treatment interaction in medial prefrontal cortex (xyz [14, 14, 6], p = .007) and superior temporal gyrus (xyz [53, 9, 2], p = .031). In particular, oxytocin (vs. placebo) reduced activity in these regions for older participants, while it enhanced activity in these regions for younger participants. In line with previous research, these findings support the notion that the effects of oxytocin vary by context and individual factors (e.g., social proficiency, age).

Authors:
Diana S. Cortes, Stockholm University
Amirhossein Manzouri, Stockholm University
Kristoffer NT Månsson, Stockholm University
Petri Laukka, Stockholm University
Natalie C. Ebner, University of Florida
Håkan Fischer, Stockholm University

Third Presentation: Examination of Behavioral and Neural Correlates of Emotional Response Inhibition in Older Adults

Presenter: Anja Pogarcic, Saint Louis University
Keywords: Cognitive Control, Executive Function, Emotion and Affect, Neuroimaging: Functional

Abstract: Response inhibition is a core domain of executive function which controls one’s attentional and behavioral responses to contextually inappropriate information. Research has demonstrated age-related declines in ability to suppress ongoing responses to irrelevant stimuli. While cognitive control over non-emotional information decreases with aging, emotional control remains stable or even improves in late life; however, the role of emotion in response inhibition is not fully understood. The aim of the current study was to identify behavioral and neural mechanisms of emotional response inhibition in cognitively normal older adults. In an MRI scanner 55 older adults completed an emotional Stop Signal Task where happy, fearful, and neutral faces served as the Stop signal. Results revealed that participants had more trouble stopping their response for emotional compared to neutral faces. Follow-up tests showed that participants had the most trouble stopping for happy compared to neutral faces, however stopping for fear and happy faces did not differ, suggesting that the effect of emotion on inhibition may not be valence-specific. Voxel-wise analyses showed increased activation in the ventromedial prefrontal cortex and amygdala for successful compared to unsuccessful inhibition across all facial expressions. However, activation patterns did not differ as a function of emotion. These results may indicate that same regions
are involved when inhibition fails for emotional and non-emotional information. These results provide new evidence for how emotional stimuli interfere with response inhibition in older adults.

Authors:
Anja Pogarcic, Saint Louis University
Samantha E. Williams, Saint Louis University
Eric J. Lenze, Washington University School of Medicine
Jill D. Waring, Saint Louis University

Fourth Presentation: Attentional refocusing subsequent a negative stressor facilitates mood improvement in old age

Presenter: Eric Allard, Cleveland State University
Keywords: Emotion and Affect, Strategy Use, Stress, Communication, Context Processing

Abstract: Research in hedonic emotion regulation and aging has placed a focus on strategies deployed either prior to, or during, exposure to a negative elicitor. The goal of the present study was to examine whether strategies implemented after exposure to an elicitor would differentially influence mood recovery for younger and older adults. Thirty-eight younger (aged 18-35) and 39 older (60-85) adults viewed a sadness-eliciting film clip while their eyes were tracked. Following the sad film, participants were instructed to disengage from any residual sad affect (through attentional refocusing) while viewing a colorful kaleidoscope film. Results revealed that older age was associated with greater mood recovery after the kaleidoscope film. Furthermore, older adults demonstrated a more expansive attentional scope during the kaleidoscope video, which was moderately associated with improved mood recovery. These results suggest older adults adeptly deploy attentional strategies subsequent a negative affective experience could facilitate positive emotion regulation outcomes.

Authors:
Eric Allard, Cleveland State University

Symposium 5: Exercise and Cognitive Aging: Key Mechanisms and Moderators

Organizer: Michelle W. Voss, PhD, Department of Psychological and Brain Sciences, University of Iowa
Keywords: Exercise and Fitness, Activity Engagement, Interventions, Executive Function, Memory

Symposium Summary: Given the accelerating growth of older adults worldwide and the decline in cognitive function with aging, therapeutics to prevent or treat age-related cognitive decline are needed more than ever. Observational and prospective studies support that greater physical activity slows age-related cognitive decline and reduces dementia risk. However, a 2017 evidence-based consensus
statement from the National Academies evaluated non-pharmacological interventions to reduce cognitive decline and found the evidence for physical activity promising but unconvincing. Mixed results from controlled interventions and lack of mechanistic understanding led to the reduced enthusiasm. It was suggested that trials starting in middle-age, with longer duration and longer follow-up periods would help clarify whether and how activity is protective. While valuable, recent results from our speakers and others support complementary approaches such as identifying key mechanistic targets like cardiorespiratory fitness, and, capitalizing on theoretically driven combinations of modalities and day-to-day acute activity benefits. Further understanding mechanisms and how modifiable moderators amplify key pathways for greater cognitive benefits would bring theoretical insight on how such plasticity is possible and inform more tailored prevention strategies.

In our symposium, the organizer Dr. Michelle Voss will present the state of the evidence across a spectrum of observational and controlled designs, which will also serve to introduce and operationalize key terms. Dr. Liu-Ambrose will present results from her recent meta-analyses and studies examining key moderators of exercise efficacy. She will comment on possible mechanisms based on work from her lab with blood biomarkers and neuroimaging outcomes. Ms. Peven will expand on the role of cardiorespiratory fitness as a potential mechanistic target, showing data to support its protective role for white matter lesions and cognitive decline. Dr. Carlson will present evidence on embedding physical activity into socially rewarding and cognitively engaging activities such as volunteering and movement-based video-games and compare and contrast potential mechanisms and moderators relative to unimodal physical activity interventions. Dr. Smith will end by presenting evidence about the acute benefits of a single exercise session on cognitive performance in older adults. Acute benefits may rely on some of the same pathways that mediate accumulated benefits from training, suggesting a complementary approach for day-to-day benefits, while also informing critical biological mechanisms that enable durable training benefits to accrue.

First Presentation: Refining Exercise Prescription for Cognitive Health

Presenter: Teresa Liu-Ambrose, Department of Physical Therapy, The University of British Columbia

Abstract: Exercise is a promising strategy for the promotion of cognitive health. However, a large degree of variation exists in its efficacy. A better understanding of what type of exercise regime is most beneficial for whom, and how each type of exercise exerts its influence on the brain will lead to tailored strategies that go beyond the one-size-fits-all approach. We conducted a meta-analysis to examine whether sex differences exists in different types of exercise training on cognitive outcomes in older adults. For executive functions, three types of exercise interventions – aerobic training (AT), resistance training, and multimodal training (i.e., both aerobic and resistance training) – were associated with larger effect sizes in studies comprised of a higher percentage of women compared to studies with a lower percentage of women. In a secondary analysis of a 6-month randomized controlled trial, in 70 older adults with mild vascular cognitive impairment, compared with balance and tone exercises, AT provided greater benefits for executive functions in females vs. males. Aerobic training also significantly increased brain derived neurotrophic levels in females vs. males. White matter lesions are a common characteristic of vascular cognitive impairment. Current evidence suggest that resistance training can reduce the progression, or even reverse, white matter lesion progression. However, in our subsample of participants who underwent neuroimaging, AT females demonstrated greater white matter lesion progression than AT males. This may be due to a number of factors including sex differences in physiological adaptation to AT and type of exercise training.
Second Presentation: Cardiorespiratory Fitness is Associated with White Matter Hyperintensity Burden in Late-life

Presenter: Jamie C. Peven, Department of Psychology, University of Pittsburgh

Abstract: White matter hyperintensities (WMH) are a marker of cerebrovascular disease, and greater volume and number of WMHs are associated with poorer cognitive functioning and a higher risk of developing dementia. Numerous studies demonstrate that higher cardiorespiratory fitness (CRF) levels are associated with enhanced brain health in late adulthood (e.g., greater hippocampal volume), but it remains unclear whether higher CRF is associated with lower WMH burden. We examined this association using baseline data from an ongoing randomized clinical trial called Investigating Gains in Neurocognition in an Intervention Trial of Exercise (IGNITE). We analyzed data from 233 cognitively-normal adults (73.8% female) aged 65-80 years (mean=69.84±3.23 years). High-resolution structural magnetic resonance imaging included a T2 FLAIR sequence for identification and segmentation of WMHs. WMH volumes were extracted using LesionMapper software. A graded maximal exercise test measured CRF (VO2peak). Volumes of WMH ranged from 0.0-8304.02mm3 (mean=831.93±1253.17) and VO2peak ranged from 11.30-36.30 ml/kg/min (mean=22.09±4.88). Greater WMH burden was associated with higher age (r=0.172, p=0.009), but not with years of education, sex, body mass index, or overall health (i.e., Cumulative Illness Rating Scale score) after adjusting for intracranial volume (ICV) (all p-values>.250). Higher VO2peak was associated with lower WMH burden after adjusting for ICV (B=-0.146, p=0.029), and trending after adjusting for age (B=-0.120, p=0.073). In a sample of healthy older adults, preliminary evidence suggests that greater CRF may be associated with reduced WMH burden. Ongoing research will corroborate these associations in a larger sample and examine whether lower WMH burden is also associated with elevated cognitive functioning.

Authors: Jamie C. Peven, University of Pittsburgh
IGNITE research team

Third Presentation: Designing Socially Motivated Interventions to Promote Cognitive and Physical Activity and Neurocognitive Health

Presenter: Michelle C. Carlson, Johns Hopkins Bloomberg School of Public Health

Abstract: I summarize evidence for the benefits of two activity-based programs designed to promote cognitive and physical activity through socially motivated goals. One program, entitled, Experience Corps® (EC), was evaluated through a large randomized controlled trial in Baltimore City (N = 702) to examine whether multi-modal engagement enhanced neurocognitive functions in older adults, most of whom were black and thus at twice the risk for Alzheimer’s disease relative to white adults of the same age. The EC program embedded social, physical and cognitive activity into generative volunteer service to children in neighborhood elementary schools over two academic years. It led to increases in daily activity, objective physical activity, generativity, and in neuro-cognitive health. Another model of socially motivated
cognitive and physical engagement targets those who may be sedentary and/or physically restricted. We demonstrate the feasibility of increasing physical activity in this group through an immersive, interactive 3-D computer game, called “Bandit the Dolphin.” The game requires the player to perform a complex combination of skilled arm movements and button presses to accomplish increasing levels of cognitive challenge while eating fish and avoiding getting eaten by sharks. Over 5 weeks of play, adults consistently improved while enjoying the game and wanting to help Bandit. To quote a player, it represents fun and “sneaky exercise because you're not thinking about how much you're moving - which I don't do a lot of anyway.” Integrated cognitive and physical activities appear beneficial among those with barriers to exercise who are motivated through social engagement.

Authors:
Michelle C. Carlson, Johns Hopkins

Fourth Presentation: Acute Exercise Promotes Engagement of Executive Control and Memory Networks

Presenter: J. Carson Smith, Department of Kinesiology and the Neuroscience and Cognitive Science Program

Abstract: Recent work from our team at the Exercise for Brain Health Laboratory has shown that acute exercise promotes short term engagement of brain networks that are vulnerable to dysregulation in aging and Alzheimer’s Disease, including the semantic memory network, the executive control network, and the hippocampus. Using a within-subjects post-test only design, a sample of 32 physically active healthy older adults completed 30 minutes of moderate intensity exercise on a cycle ergometer, and 30 minutes of seated rest, on separate days in a counterbalanced order. Immediately after each exercise or rest session, participants underwent a multi-modal MRI scan session. Using a famous name discrimination task, we found that exercise resulted in greater fMRI activation in the semantic memory network, and the bilateral hippocampus. We also observed greater fMRI activation in regions involved in executive control during the performance of the Flanker task after exercise compared to rest. Finally, using diffusion weighted imaging, we found that acute exercise induced microstructural plasticity within the hippocampus. Collectively, these effects suggest acute exercise promoted engagement of the semantic memory network (which overlaps with the default mode network, a location of beta-amyloid burden in Alzheimer’s disease), the executive control network, particularly when inhibitory control is needed to complete a task, and served to activate the hippocampus during memory retrieval. These findings have implications for understanding how single sessions of exercise impact neural networks that may lead to adaptations over time with exercise training.

Authors:
J. Carson Smith, University of Maryland

Poster Session E

Saturday, April 18
5:30 PM -- 7:30 PM
**Sunday, April 19**

**Poster Session F**

Sunday, April 19  
8:00 AM -- 10:00 AM

**Sunday, April 19**  
10:30 AM -- 12:30 PM

**Plenary 3:** Interventions

**Overview Speaker:** George Rebok, Johns Hopkins University

**First Presentation:** Synergistic effects of cognitive training and physical exercise on dual-task performance in older adults

**Presenter:** Louis Bherer, Department of Medicine, Université de Montréal, Research center, Montreal Heart Institute  

**Keywords:** Dual-Task Abilities, Divided Attention, Cognitive Training, Physical Exercise, Combined Intervention

**Abstract:** Background: Studies have reported benefits of physical exercise and cognitive training to enhance cognition in older adults. However, most studies did not compare these interventions to appropriate active controls. Moreover, evidence of synergistic effects of both types of intervention remain understudied.

Objective: This study investigated the synergistic effect of cognitive training and aerobic/resistance physical exercise on dual-task (DT) performance in older adults. Intervention effects were compared to active controls for both the cognitive and the exercise domain.

Methods: Eighty-seven community-dwelling older adults completed one of four different combinations of interventions. These interventions included a cognitive DT training (COG+), an aerobic/resistance training (AER+), a computer lessons (COG-), and stretching exercises (AER-). COG- and AER- were used as active placebos to COG + and AER+ respectively. Participants were randomly assigned to 4 groups: COG+/AER+ (n=26), COG+/AER- (n=23), COG-/AER+ (n=20), COG-/AER- (n=18). Training sessions were held three times per week for three months. The primary outcome was performance in an untrained transfer computerized DT. Stepwise backward removal regression analyses were used to predict pre- vs. post-test changes in performances in the different groups.

Results: Participation in AER+ did not predict improvement in any DT outcomes. Participation in COG+ predicted reduction in DT cost and participation in COG+/AER+ predicted reduction in task-set cost.

Discussion: Results suggest that the combination of cognitive and physical protocols exerted a synergistic effect on task-set cost which reflects the cost of maintaining multiple response alternatives.
Second Presentation: A Systematic Review and Meta-Analysis of Older Driver Interventions

Presenter: Bernadette A. Fausto, Rutgers University — Newark

Keywords: Interventions, Driving

Abstract: The purpose of this systematic review and meta-analysis was to summarize and quantify the effects of different driving interventions among older adults on outcomes of crashes, on-road driving performance, self-reported outcomes of errors and crashes, and driving simulator performance. Randomized controlled trials examining the effects of a driving intervention among older adults ≥ 50 years of age were included. Thirty-one studies were identified in systematic review, and 26 were included in meta-analyses. Effect sizes were calculated using random-effects. The following types of interventions emerged in systematic review: physical retraining/exercise (e.g., flexibility and coordination training); visual-perceptual training (e.g., improving figure-ground discrimination); cognitive training (e.g., Useful Field of View cognitive training); education (e.g., classroom driver refresher course); context-specific training (i.e., on-road training in car, driving simulator training); combined intervention approaches (e.g., education and context-specific training combined). Across studies, skill-specific interventions (i.e., physical retraining/exercise, visual-perceptual training) and combined intervention approaches demonstrated medium to large effects on on-road driving performance among those trained, $d_s = 0.564–1.061$, $p < .050$. Cognitive training approaches reduced at-fault crashes by almost 30%, $OR = 0.729$, 95% $CI [0.553, 0.962]$, $p = .026$. Education and context-specific approaches were not efficacious to improve any driving safety outcomes of interest, $p > .050$. In summary, skill-specific interventions and combined intervention approaches improved on-road driving performance and reduced at-fault crashes. Optimizing interventions that target age-related functional declines and combined intervention approaches is recommended.

Authors:
Bernadette A. Fausto, Rutgers University — Newark
Jerri D. Edwards, University of South Florida
Third Presentation: Train the aging brain through music: A randomized controlled trial in healthy older adults in Germany and Switzerland

Presenter: Matthias Kliegel, University of Geneva, Switzerland
Keywords: Training, Music, Interventions

Abstract: Recent data suggest that musical practice may have the potential to prevent age-related cognitive decline, but experimental evidence remains sparse. This study combines for the first-time standardized music practice in elderly with a comprehensive longitudinal assessment of possible changes on the behavioral and neural level comparing two types of musical education.

Our multi-site Hannover-Geneva longitudinal randomized intervention study in altogether 150 retired healthy elderly (64-76 years), offers either piano (experimental group) or musical culture instruction without practice (control group). Over 12 months participants receive weekly training (60 minutes) and exercise at home for 30 minutes daily. Measurements take place at 4 time points (0, 6, 12 months & post-training (18 months)) on cognitive (e.g., working memory, episodic and prospective memory, executive functioning, reasoning, and processing speed) and perceptual-motor abilities as well as on wide-ranging functional and structural neuroimaging as well as everyday life markers such as well-being.

We will present results after 6 months of musical training, for which data collection is about to be terminated. The talk will focus on behavioral outcome data but also look at moderators of possible training effects as well as analyze the relation of within treatment training progress and outcome effects. In the piano group, we particularly expect to report positive effects for working memory, executive functions and Abstract thinking. We expect benefits in both groups for verbal memory, hearing in noise and well-being.

Authors:
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Cécile Marie Dupin, Geneva, Switzerland
Alexandra Hering, University of Geneva, Switzerland
Florian Worschech, Hanover University of Music, Germany
C.E. James, University of Applied Health Sciences

Fourth Presentation: When is more better? The effect of dose on efficacy of the MAPT multidomain intervention in older adults

Presenter: Sylvie Belleville, University of Montreal
Keywords: Training, Dose, Interventions

Abstract: An increasing number of studies examine whether multidomain intervention can prevent cognitive decline in older adults at-risk for dementia. Response is likely to vary with the amount of dose
received for individual components, but there is very little data regarding the optimal dosage or how the effect accumulates with dose. Here we used data from the Multidomain Alzheimer Preventive Trial (MAPT) to model the relation between cognitive training dose and cognition. The MAPT is a 3 year-randomized trial comprising cognitive training, physical activity, nutrition and omega 3 polyunsaturated fatty acid. The number of hours of cognitive training attended (Max=28) was used as a measure of dose in the 749 participants randomized to the multidomain intervention arms. Polynomial regression analysis first modelled cognitive performance over time and mixed model analyses then measured the effect of dose. A cubic function was found to explain the relation between dose and performance on global cognition, episodic memory and verbal fluency. In all cases, larger dose was related to better cognition up to about 12-14 hours of training, after which larger dose was no longer incrementally associated with cognition. There were small regains of improvement after about 23 sessions. Our study indicates a non-linear dose-response function when examining cognition as an outcome, indicating that more dosage is not necessarily better. In this case, the optimal dose was found to be 12-14 hours of training, about half the one that was potentially available to participants.

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2020 CAC Posters

1: Feeling-of-Knowing Judgments During Tip-of-the-Tongue States Predict Hypercorrection

Poster Session: A
Presenter: Lise Abrams, Pomona College
Keywords: Metacognition, Memory, Language Production

Abstract: Previous research has documented a hypercorrection effect, i.e., enhanced memory for corrective feedback to errors that were initially judged with high confidence to be correct relative to errors with low confidence. This effect has been shown to be reduced in older adults and with a longer delay between the error and retest. The present experiment investigated the hypercorrection effect in the context of retrieval failures, specifically tip-of-the-tongue (TOT) states, which are temporary failures to retrieve a known word and notoriously increase with aging. TOTs are often accompanied by a strong feeling of knowing the word (FOK) and therefore may benefit from hypercorrection. Younger adults and older adults saw general knowledge questions corresponding to a target word and indicated whether they knew, did not know, or were having a TOT. Following TOT and don't know responses, participants made a feeling-of-knowing (FOK) judgment which indicated their estimated probability of recognizing the unretrieved word. They then saw a five alternative, multiple-choice test and attempted to select the target. Regardless of the correctness of their response, the target was displayed for five seconds, and participants read it aloud. After a 15-minute or 7-day delay, participants saw the general knowledge questions again and attempted target retrieval. For targets incorrectly recognized on the multiple-choice test, results demonstrated a hypercorrection effect where targets in a TOT accompanied by high FOKs were more likely to be correctly recalled after a delay than those with low FOKs. Differences between younger and older adults’ hypercorrection will be discussed.

Authors:
Kristine L. Chang, Pomona College
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Lise Abrams, Pomona College

2: Predicting Alzheimer's Disease based on Pre-Existing Health Conditions

Poster Session: A
Presenter: Hannah L Apostolou, University of Alabama
Keywords: Alzheimer's Disease, Cognitive Decline

Abstract: Despite decades of research, Alzheimer’s disease (AD) remains without a cure and continues to be a leading cause of death in the United States. Knowing that each case of AD is unique and impacts it’s host at a different rate and magnitude, it is logical to conduct research focused on prevention of the disease rather than after a clinical diagnosis. Prior research has used risk scores in order to predict the likelihood of an individual developing AD based on sociodemographic and genetic factors. The logic behind the risk score is that the more unfavorable factors an individual possesses, the more at risk they are of developing AD. The present study aims to create a risk score based on lifestyle factors and pre-existing health conditions by examining regional white matter and cognitive functioning. Longitudinal data from the National Alzheimer's Coordinating Center (NACC) will be used to compute a risk score based on pre-existing health conditions in individuals that have not been diagnosed with AD at baseline. Structural imaging data will be obtained from the NACC dataset in order to evaluate white matter volume in the frontal and temporal lobes. This longitudinal study allows us to examine how baseline risk factors impact long-term cognition based on the risk score prediction, and aims to predict one’s risk of developing AD based on diagnoses of pre-existing health conditions.
3: The Weight of Advice in Older Age

**Poster Session: A**

**Presenter:** Phoebe E Bailey, Western Sydney University

**Keywords:** Decision making, Social Context

**Abstract:** While young adults prefer autonomous decision-making, older adults tend to avoid decisions or delegate them to others. However, little is known about potential age-related differences in the use of social information such as advice when making decisions. Young (n = 56) and older (n = 56) adults, screened for signs of cognitive impairment, completed a judge-advisor system task. In this paradigm, across repeated trials, the judge (i.e., the decision-maker) makes an initial numerical estimate (i.e., the rental value of an apartment). The advisor then gives their advice in the form of an estimate, after which the judge is given the opportunity to revise their estimate. The weight of advice can then be calculated. While completely ignoring advice yields a score of zero (i.e., second estimate = initial estimate), completely relying on advice yields a score of one (i.e., second estimate = advisor’s estimate). Whether the advisor was introduced as an expert or a novice was manipulated within subjects. We also measured desire for autonomy, memory, and fluid intelligence. The data show that young and older adults give more weight to expert than novice advice. But, relative to their younger counterparts, older adults give more weight to advice overall. We discuss the degree to which this increased weighting of advice is associated with age-related differences in cognition and desire for autonomy. These findings shed new light on the role of social information in age-related differences in decision-making.

**Authors:**
Phoebe Bailey, Western Sydney University
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Ahmed Moustafa, Western Sydney University
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4: Memory Engagement and Health Mediate Link between Personal Control Beliefs and Episodic Memory in Aging

**Poster Session: A**

**Presenter:** Mercedes E Ball, University of the Pacific

**Keywords:** Metacognition, Episodic Memory, Strategy Use, Health and Well Being, Activity Engagement

**Abstract:** A greater sense of personal control is related to better episodic memory, yet both factors are vulnerable to age-related decline. Control beliefs likely relate to memory through multiple pathways. For example, the link between higher levels of global personal control beliefs (perceived mastery) and age-related changes in memory are mediated by physical health. However, the mediating role of mental health is unclear, as is examination of memory-specific personal control beliefs (memory control beliefs). This research extends past work by testing (1) whether the relationship between perceived mastery and memory was mediated by mental and physical health in parallel and (2) whether the relationship between memory control beliefs and memory were mediated in series by engagement in memory activities and specific mnemonic use. Healthy, community-dwelling adults (N=121; aged 51-93, M=73.3, SD=8.32; 79% female; 92% white) completed tests of episodic memory (delayed recall of a word list and learning new face-name pairs) and answered surveys about health, perceived mastery, memory control beliefs, overall engagement in memory activities, and specific mnemonic use. The relationship between perceived mastery and memory was fully mediated by self-reported mental health. Higher levels of memory control beliefs related to greater engagement in memory activities, which explained greater mnemonic use, and
greater mnemonic use predicted better memory. This work evidences that beliefs might relate to performance because of their relationship with a variety of personal and behavioral factors. We propose cognitive interventions should target changes beliefs and techniques.

Authors:
Mercedes E. Ball, University of the Pacific
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5: Music Therapy Effectiveness in Reducing Symptomatology in those with Alzheimer's Disease:
Poster Session: A
Presenter: Denise Carballea, Albizu University
Keywords: Alzheimer's Disease, Dementia, Music, Cognitive Impairment, Cognitive Decline
Abstract: It has been suggested that music therapy is an effective treatment for maintaining and improving social and emotional cognitive skills, as well as decreasing behavioral problems with those suffering from Alzheimer's Disease (AD). The purpose of this literature review was to examine music therapy as a modality to treat negative symptoms associated with AD. Reviewed literature indicates that music therapy has been shown to enhance self-consciousness, an issue those with AD experience. Additionally, antipsychotic drugs are often used to improve behavioral symptoms of this population. However, music therapy has the advantage of considering interactions between the patient, their caregiver, the environment, and treatment design. These music interventions showed to be helpful in decreasing symptoms of agitation and irritability. Studies demonstrated that music therapy can be effective in increasing positive behaviors, while significantly reducing negative behaviors. Music therapy also helps patients with improvements with memory, attention, alert response, language skills, and speech fluency. Research has shown that music therapy has beneficial results in cognitive, emotional, and social domains involved in AD. Music therapy can be used to reduce aggressive behavior and enhance a sense of self-consciousness in this population. Music therapy is a low-cost and non-invasive treatment method that can help those with AD connect to themselves and improve their cognitive function. Further studies should be conducted to better understand if there is an anxiety mechanism involved in listening to music.

Authors:
Denise Carballea, Albizu University
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Alexandria Marullo, Albizu University
Alfredo Ardila, Albizu University

6: How can we support route learning in older adults? the role of imagery strategy
Poster Session: A
Presenter: Elena Carbone, Department of General Psychology - University of Padova
Keywords: Spatial Ability, Strategy Use
Abstract: Route learning is an everyday spatial ability important to individuals’ independent living, and is known to decline with age. This study aimed to investigate the benefit of using an imagery strategy to support route learning in young and older adults.

Forty young adults and 40 older adults learned a path from a video. Twenty of each age group were taught to use an imagery strategy (strategy groups [SGs]), while the others received no specific instructions (control groups [CGs]). Then participants were asked to recall the order and location of landmarks they
had seen along the path (landmark ordering and locating tasks). Young adults recalled the order and location of landmarks better than older adults, and the SGs outperformed the CGs regardless of age. The Age group x Learning group interaction was only significant for the landmark locating task, with the young CG performing better than the older CG, while the older SG proved as good at recalling landmark locations as the young SG. Further, it was only among the older adults that the SG outperformed the CG.

These findings newly suggest that using imagery helps older adults to compensate for the age-related decline in route learning ability, especially in spatial recall tasks demanding the active manipulation of spatial information learnt, such as locating landmarks previously encountered while navigating a path.

Authors:
Elena Carbone, Department of General Psychology - University of Padova
Chiara Meneghetti, University of Padova
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7: Might Metamemory Be Maintained in Matured Minds?

Poster Session: A
Presenter: Elyse J Carlson, Georgia Institute of Technology
Keywords: Metacognition, Associative Memory, Cognitive Decline, Learning, Strategy Use
Abstract: Prior research has demonstrated that older adults have limited flexibility in adopting new encoding strategies (Naveh-Benjamin et al., 2005). However, when they do employ strategies, they exhibit improved memory performance in the target domain (Bailey et al., 2004; Touron, 2015). While metamemory judgments had previously been thought to be preserved in aging (Rabinowitz et al., 1982; Hertzog et al., 2002), this idea has recently been called into question (Kuhlmann & Undorf, 2018). The current study tests the accuracy of metamemory judgments in aging. In this experiment, 25 younger adults (21-35) and 14 older adults (60-75) were instructed to learn 120 word-picture pairs utilizing an interactive imagery strategy. During encoding, participants made judgments of learning (JOL), rating confidence in their ability to remember each word-picture pair in the future. A paired associates task tested memory retrieval. At post-test, subjects were further probed on specific features.

While there were no age differences in JOLs at encoding, older adults were less accurate than younger adults at retrieval, suggesting that metamemory judgments are not preserved in aging. Additionally, older adults performed at chance when prompted to retrieve detailed information about images they had previously viewed, suggesting that the strategy was not effectively implemented or they were unable to reactivate rich mental images to the same degree as younger adults.

Additional research aims include gaining a better understanding of whether memory failures occur at the encoding or retrieval stage and testing whether disparities in the quality and degree of memory retrieval translate to differences in brain activity.

Authors:
Elyse J. Carlson, Georgia Institute of Technology
Amy H. Dang, Northeastern University
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Mark E. Wheeler, PhD., Georgia Institute of Technology
8: Designing learning through voice-based interactions with conversational agents among older adults

**Poster Session:** A  
**Presenter:** Jessie Chin, University of Illinois at Urbana-Champaign  
**Keywords:** Human Factors, Human Computer Interaction, Metacognition  
**Abstract:** The access to healthcare service (including knowledge about health topics and self-care skills) among older adults could be limited given the age-related changes in cognitive functions, health literacy, and physical capacities, especially for homebound older adults in the rural area. The rise of home-based commercially available conversational agents (CAs, such as Amazon Echo, Google Assistant) have demonstrated potentials to solve this disparity by delivering service to rural homebound older adults. According to Pew research report, 37% of older adults use voice-based interfaces on a regular basis. Previous studies also showed that there was no age difference in technology acceptance of CAs. Older CA users showed similar perceived ease of use and perceived usefulness as the younger CA users. The current study was designed to examine the use of CAs to deliver learning, such as teaching older adults (1) health information, and (2) health care skills, through natural language conversations. We built two theory-based actions on Google Home device, one teaching users to acquire health knowledge through interactive dialogues; the other teaching users to do a low-intensity stretch exercise (Go4Life). 20 older adults were recruited to complete 10 learning trials (5 in learning new health information; 5 in learning new exercise). Learning outcomes were measured by immediate recall and the delayed cued recall of both knowledge and skills. Results showed that it is feasible to deliver learning to older users using CAs. The relationships among learning outcome, user experience and technology self-efficacy among older users were also discussed.  
**Authors:**  
Jessie Chin, University of Illinois  
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Eileen Lopez, University of Illinois

9: A Database of General Knowledge Question Performance in Older Adults

**Poster Session:** A  
**Presenter:** Jen Coane, Colby College  
**Keywords:** Knowledge, Semantic Memory  
**Abstract:** General knowledge (GK) questions are commonly used in experimental and clinical settings. In the former, common uses include research on tip-of-the-tongue states, metacognition, and educational applications of cognitive science. GK is also used as a measure of crystallized intelligence. GK increases over the lifespan, with older adults out-performing younger adults on vocabulary and GK tests (e.g., Salthouse, 2004). This makes it challenging to identify GK questions that are matched in difficulty across age groups. A popular source for GK questions are Nelson and Narens’ (1980) norms for 300 Items, which were recently updated by Tauber et al. (2013). However, both of these sets were normed with younger adults. Thus, if researchers wish to have items that yield similar rates of performance across age groups, such norms provide insufficient information. We selected over 400 questions ranging in difficulty and tested older adults in both open-ended and multiple-choice questions. On the open-ended questions, participants were given the option of replying “I don’t know” (IDK) or “I don’t remember” (IDR) as a phenomenological indicator of which items were associated with perceived lack of availability versus lack of accessibility (Coane & Umanath, 2019). Accuracy on the multiple-choice and open-ended questions was positively correlated, although accuracy was higher in the former. These norms will be of use to researchers who are interested in selecting GK questions for older participants to meet specific criteria.
10: Alternative Estimates of Category Exemplar Typicality across Adulthood

**Poster Session:** A

**Presenter:** Taylor M Curley, Georgia Institute of Technology

**Keywords:** Methods, Semantic Memory, Memory

**Abstract:** Semantic categories are composed of exemplars (e.g., dog and cat for the category ANIMAL). The typicality of a given exemplar within a category provides information on how prototypical that item is of the category (e.g., dog might have a higher typicality score than whale for the category ANIMAL). Typicality of exemplars has significant influence on memory and language processes (Nelson, McEvoy, & Schreiber, 1992). Typicality estimates published in category norm datasets (e.g., Battig & Montague, 1969; Van Overschelde, Rawson, & Dunlosky, 2004) are the mean response frequency of a given word in an exemplar generation task that may distort typicality at the low end of the scale. Moreover, the frequency of exemplars may not be stable across time and age groups. Further, well-established age differences in word fluency may bias data collected from older adults or from individuals with low-level typing skills. Thus, we assessed alternative methods of obtaining exemplar typicality. Specifically, 447 participants (143 young adults 18-39 years old, 133 middle-aged 40-59 years old, and 171 older adults 60 years and above) completed two tasks aimed at assessing exemplar typicality: 1) ordering of category exemplars from most to least typical, and 2) rating category exemplars on typicality using a 10-point Likert scale from 1 (least) to 10 (most). Results did reveal age differences in rated versus frequency-generated typicality. We interpret these alternative measures of typicality with respect to previous gathered category norms and provide an accessible data base for stimulus-generation for cognitive aging researchers.

**Authors:**
Taylor Curley, Georgia Institute of Technology
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11: The More Things Change, The More They Stay The Same: Prevalence-Induced Concept Change in Older Adults

**Poster Session:** A

**Presenter:** Sean Devine, Concordia University

**Keywords:** Decision making, Categorisation, Reasoning

**Abstract:** Prevalence-induced concept change is the process by which someone’s definition of a concept shifts as the prevalence of that concept changes. For instance, in a task where people have to judge whether the colour of an ambiguously-coloured dot is blue or purple, if the frequency of objectively blue dots in the environment decreases, people expand their concept of blueness and judge more dots to be blue than they did initially. In an impressive series of experiments, Levari et al. (2018) demonstrated that this phenomenon extended to higher-order decision-making, such as ethical judgments as well. What these findings suggest is that conceptual spaces (whether it’s about colours or ethical statements) in humans are not fixed but sensitive to changes in the prevalence of relevant events in the environment.

While Levari et al. (2018) established this phenomenon in young adults, it is unclear how it affects older adults: do they outsource control and become more susceptible to this shift or are they rigid enough in their beliefs to be resistant to it? In the current study, we explore how prevalence-induced concept change affects older adults’ low-level, perceptual, and higher-order, ethical, decision-making. We find that older
adults are less sensitive to prevalence-induced concept change than younger adults across both domains. The mechanisms underlying these difference are further described using a computational model that explores the extent to which this is due to the past sequence of stimuli and responses: the former intensifying prevalence-induced concept change and the latter reducing it. Our results suggest that older adults’ concept space may be less flexible than younger adults’ when faced with a changing world.

Authors:
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12: Associations of Locus Coeruleus Integrity, Cognitive Impairment, and Sleep-Wake Disturbance: Implications for Aging and Alzheimer’s Disease

Poster Session: A
Presenter: Jeremy A Elman, University of California, San Diego
Keywords: Neuroimaging: Structural, Mild Cognitive Impairment, Sleep Quality, Alzheimer’s Disease,
Abstract: The locus coeruleus (LC) is one of the earliest sites of Alzheimer’s disease (AD) pathology, and this region experiences extensive neurodegeneration throughout the disease. The LC has long been associated with arousal and the sleep-wake cycle, which are commonly disrupted in aging and AD. Recent research also implicates the LC in modulating cognitive function. We therefore examined whether LC structural integrity was associated with cognitive performance, mild cognitive impairment (MCI), and sleep-wake disruption in 481 late-middle-aged men (mean age=67.5; range=62-71.7) from the Vietnam Era Twin Study of Aging. LC structural integrity was indexed by contrast-to-noise ratio (LC-CNR) in manually marked regions of an FSE T1-weighted MRI scan. Cognitive performance was assessed using factor scores across multiple domains. Amnestic MCI (aMCI) was diagnosed according to Jak-Bondi criteria. The daytime dysfunction component of the Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep-wake disruption. We tested the relationship between LC-CNR, cognitive performance, aMCI status, and daytime dysfunction. Participants with aMCI showed significantly greater daytime dysfunction compared to cognitively unimpaired participants. Lower LC-CNR was associated with increased odds of aMCI and greater daytime dysfunction. Lower LC-CNR was also associated with lower episodic memory, general fluency, semantic-specific fluency, and processing speed factor scores. These results suggest that LC damage may contribute to sleep-wake disturbances and cognitive impairment among those with aMCI, a presumed early stage of AD dementia. Furthermore, these findings in late-middle-aged adults highlight the potential utility of MRI-based measures of LC integrity in early identification of AD risk.

Authors:
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13: Age differences in the effect of contextual information on metamemory judgments

Poster Session: A
Presenter: Tasnuva Enam, The University of Alabama
Keywords: Metacognition, Beliefs about Aging, Memory
**Abstract:** In studies of episodic memory, context can refer to any type of information that accompanies encoding or retrieval but is not itself an intended target of either encoding or retrieval. In the current study we investigated age differences in how different types of contextual information (reinstated, re-paired and new contexts) influence metamemory decisions, specifically Feeling of Knowing (FOK) judgments. Younger and older adults viewed a series of cue-target picture pairs superimposed on a black and white background scene. This phase was followed by a cued recall test and accompanying FOK judgment in which the backgrounds were reinstated, re-paired with old but different scenes, or new scenes. Lastly, participants received a final recognition memory test. In younger adults, recall was best in the re-paired context condition whereas in older adults, recall was best in the reinstated context condition. For metamemory judgments, younger adults had the highest FOK ratings in reinstated and re-paired context conditions whereas older adults had the highest FOK ratings in the re-paired context condition. Thus, we found that aging differentially impacted how contextual information influenced both metamemory judgments and memory. The present findings provide hints as to the origins of false memories in old age.

**Authors:**
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14: Face forward: Age differences in decisions to trust during a social version of the Iowa Gambling Task

**Poster Session:** A

**Presenter:** Ian Frazier, University of Florida

**Keywords:** Decision making, Trust, Iowa Gambling Task, Cognition

**Abstract:** There is growing evidence that older adults may show an age-related reduced sensitivity to cues of untrustworthiness. This reduced sensitivity may underlie greater susceptibility to deception among older adults, especially when interacting with “wolves in sheep’s clothing” (i.e. when a trustworthy looking individual behaves in an untrustworthy manner) and may be suggestive of impaired trust-related decision making in aging. To test this hypothesis, we developed a social version of the Iowa Gambling Task (social IGT) for use in younger (18 to 35 years) and older (65 to 85 years) adults. This novel paradigm utilizes the well-established, risk-learning reinforcement schedule of the standard IGT but, rather than playing card decks, leverages more and less trustworthy looking faces to represent the more or less advantageous decks (congruent social IGT version) and vice versa (incongruent social IGT condition). Participants were informed that previous participants had designed these decks to either share or take away monetary gains in the task. In a repeated-measures, between-subject design, participants completed (randomly assigned) either the standard IGT, the congruent social IGT, or the incongruent social IGT. Preliminary data analysis suggests a three-way interaction between age group (younger, older), condition (IGT, congruent social IGT, incongruent social IGT), and block (5 blocks of 20 trials each), in that younger participants outperformed older participants by the 4th block in both the standard IGT ($p = .048$) and the incongruent social IGT ($p = .005$; $F(8,46) = 2.76$, $p = 0.014$, partial $\eta^2 < 0.347$).

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15: Do Younger and Older Adults See Themselves as Better than Average? Not at Remembering People's Names
Poster Session: A
Presenter: Mary B Hargis, Texas Christian University
Keywords: Metacognition
Abstract: People see themselves as better than average in many domains, from leadership skills to driving ability. However, many people – especially older adults – struggle to remember others’ names, and many of us are aware of this struggle. People’s beliefs about their memory for names may be different from other information; perhaps forgetting names is particularly salient. We asked younger and older adults to rate themselves compared to others their age on several socially-desirable traits (e.g., honesty), their overall memory ability, and their specific ability to remember scientific terms, locations, and people’s names. Participants demonstrated a better-than-average effect in their ratings of most items except their ability to remember names, which both groups rated as approximately the same as others their age. The better-than-average effect is present in many of younger and older adults’ judgments, but people may be more attuned to memory failures when those failures involve social consequences.
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16: The Role of Nutrition and Inflammation on Cognition in High Risk Groups for Alzheimer’s Disease
Poster Session: A
Presenter: Jordan M Jackson, Emory University, Rollins School of Public Health
Keywords: Alzheimer's Disease, Cognitive Impairment, Inflammation, Nutrition
Abstract: Alzheimer’s Disease (AD) is the most prevalent neurodegenerative disease. Current treatments are being developed that will target people with high risk for AD. Ethnicity and sex play an essential role in aggravating the risk of Alzheimer’s Disease. Furthermore, there are also lifestyle factors that contribute to a greater risk for development of AD such as nutrition. Tumor necrosis factor alpha (TNF-α) plays an essential role in the cytokine cascade during an inflammatory response. Inflammation is crucial to the development of AD pathophysiology, and consuming a high-fat diet induces increased tissue expression of TNF-α. This study investigates the relationship between nutrition, inflammation, and cognition in African American women (age: M = 59.5, SD = 8.20 [42–73 years]) at risk for developing of AD. Using a cross-sectional analysis, participants were split into high fat and low fat groups based on their total fat consumption as reported on the Mississippi Delta FFQ. A high-fat diet was associated with a significant 2-fold increase in TNF-α (OR=2.14; 95% CI: 0.2043-22.4781) and was correlated with increased blood serum TNF-α (r=.442; p = 0.024). In addition, participants underwent executive function, dual-tasking, visuospatial, and global cognition assessments. Global cognition was higher in those who consumed a higher fat intake. There was no significant difference across groups for executive function, dual-tasking, and visuospatial results. The results of this study indicate that there may be multiple biological pathways at work suggesting a more holistic approach for future studies.
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17: EEG evidence of slow frequency activity during the resting state in MCI
**Poster Session: A**

**Presenter:** Farooq Kamal, School of Psychology, University of Ottawa, Bruyère Research Institute  
**Keywords:** Mild Cognitive Impairment  
**Abstract:** Current research has shown that cognitive decline due to Alzheimer’s disease is characterized by fluctuations in the level of EEG activity. However, little research has been done to examine whether these changes are also present in mild cognitive impairment (MCI). The goal of the current study was to determine whether those with MCI also exhibit abnormal fluctuations of resting state EEG activity. The present study recorded EEG during an eyes-closed resting state in twenty healthy older adults and twenty older adults with MCI. The mean level of EEG activity across different frequency bands will be analyzed and further correlated with cognitive tasks such as the Montreal Cognitive Assessment (MoCA). Preliminary results indicate an increase in mean level of EEG activity in people with MCI; specifically, we observed an increase in theta and delta power over widespread scalp areas compared to healthy older adults. An increase in theta and delta band might reflect increased drowsiness and decreased alertness in people with MCI. Consistent with this interpretation, alpha power over posterior sites was also reduced in the MCI group. It is expected that these fluctuations will correlate with MoCA scores.  
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18: Frontal alpha asymmetry (FAA) and cognitive declines in older African American adults  
**Poster Session: A**  
**Presenter:** Voyko Kavcic, Wayne State University, Institute of Gerontology  
**Keywords:** Cognitive Decline, Mild Cognitive Impairment, Frontal Alpha Asymmetry, Short-term Cortical Plasticity  
**Abstract:** We examined whether frontal alpha asymmetry (FAA) is age-affected and if FAA is associated with cognitive decline. We studied 28 elderly participants with amnesic mild cognitive impairment (MCI) and 13 with non-amnesic MCI, and compared them to 58 control participants without MCI. All participants were African American. We measured resting EEG at the beginning of the EEG session, and estimated delta, theta, alpha, and beta band power over frontal, left and right temporal, parietal, and occipital regions of interest (ROI). We evaluated FAA by subtracting the left from right natural log transformed power in alpha band from electrode pairs over the frontal ROI. FAA was not correlated with age or with measures of cognitive functioning. We measured resting EEG also after a motion direction discrimination task at the same ROIs to estimate short term cortical plasticity. We found a significant decrease in the beta band after the task in all regions except frontal, with significantly larger decreases in MCI participants than controls over central and parietal sites. These decreases in beta power were unrelated to performance on the task but were positively correlated with resting alpha asymmetry (FAA) measured from FC4 and FC3, but not more frontal sites, before the task. While the functional significance of these associations are largely unknown, we speculate that changes in beta power after a simple cognitive-perceptual task may index short-term cortical plasticity. Short-term cortical plasticity combined with FAA shows promise for distinguishing MCI patients from cognitively normal controls.  
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19: Self-Reported Strategy Use Among Older Adults for Laboratory Prospective Memory Tasks

**Poster Session: A**

**Presenter:** Keri Kytola, Wilson College, Oklahoma State University

**Keywords:** Prospective Memory, Metacognition, Strategy Use, Everyday Memory, Memory

**Abstract:** The metacognitive components of prospective memory have received relatively little attention. This study builds on earlier work (Reese-Melancon, Harrington, & Kytola, 2019) to identify the strategy repertoire older adults employed on a common laboratory prospective memory task and to determine whether self-reported strategy was related to performance. Older adult participants were randomly assigned to complete either a focal or nonfocal prospective memory task embedded in a lexical decision task. The results indicated that, similar to the younger adults in our earlier work, older adult participants reported the same strategy repertoire regardless of the focality of the prospective memory task with monitoring and physical action (e.g., holding a finger over the prospective response key or looking at response key) being the most frequently reported strategies. In terms of performance, participants in the nonfocal condition who reported using a strategy performed better than those who did not report using one, but in the focal condition, performance was similar regardless of whether strategy use was reported. These findings add to what is known about strategy use and prospective memory, especially among older adults, and underscore the need for additional research examining the role of metacognition in prospective memory.

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20: Applying the Dual Mechanisms of Control Model to Postural Recovery

**Poster Session: A**

**Presenter:** Laurence Lai, Concordia University

**Keywords:** Executive Function, Cognitive Control, Motor Skills, Measurement

**Abstract:** According to the Dual Mechanisms of Control model (Braver, 2012), cognitive control is either proactive (PC: anticipatory selection) or reactive (RC: stimulus-driven selection), the former being less often used by older adults due to its working memory demands. Although it is known that executive control processes are increasingly recruited for motor performance with aging, PC and RC have not yet been examined in this context. Therefore, we compared healthy young and older adults (YA, OA) using a cued postural recovery paradigm. In Session 1, participants of both age groups completed background neuropsychological measures to establish their baseline executive function performance. In Session 2, participants received visual cues indicating whether the balance platform would move. Cue validity varied similarly to Braver’s original test of PC and RC. PC or RC bias was operationalized by the proportion of anticipatory postural responses (APR; PC) relative to compensatory postural responses (CPR; RC), as measured by electromyography of targeted major muscle groups. A higher ratio of APR to CPR would be indicative of PC bias due to more effective usage of cues. Effect size analyses revealed that YA exhibited greater proportions of APR than CPR on valid cue trials (moderate to large effect size, Hedges’ g = .698) than OA, suggesting a relatively higher PC bias. OA showed a relatively smaller proportion of APR to CPR
(g = .549) than YA, suggesting degraded PC performance. Together, the findings align with previous cognitive age-comparative findings, and suggest possible cognitive training targets for falls prevention.

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21: Cognitive control in speech perception: A comparison between normal aging and adults with cognitive impairment

Poster Session: A
Presenter: Amelia Mainardi, Washington University Medical School
Keywords: Cognitive Control, Cognitive Impairment
Abstract: Spoken word recognition is frequently assumed to be relatively automatic. However, in the presence of background noise, cognitive control may facilitate selecting correct words among competing alternatives. A challenge in assessing the role of cognitive control in speech perception in older adults is the co-occurrence of sensory impairment and/or cognitive decline in this population. Here, we used a word identification task in quiet and noise (varying the signal-to-noise ratio, SNR) to examine cognitive control abilities in older adults with cognitive impairment and normal healthy controls. Words with high neighborhood density (many competitors) are typically more difficult to perceive and likely place additional demands on cognitive control systems compared to those with a sparse neighborhood density (Luce and Pisoni, 1998). Therefore, we hypothesized a greater decrease in task performance for cognitively impaired participants compared to normal aging adults on conditions that require the greatest cognitive control (i.e., high-density words, higher level noise). Preliminary results (n = 39) suggest that both groups struggled to correctly identify target words in challenging SNRs compared to the quiet condition. Furthermore, high density words in challenging SNRs caused greater decrement in task performance for individuals with cognitive impairment. Additionally, we observed a moderate correlation between higher identification accuracy in noise and better scores on tests of working memory and executive function. These results suggest that additional cognitive resources, beyond cognitive control, support spoken word processing in noise.

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22: Jumping to Conclusions: Lévy Flights Characterize Younger but not Older Adults During Fast Binary Decisions

Poster Session: A
Presenter: Aalim Makani, Ryerson University
Keywords: Decision making, Response-Time Modeling
Abstract: Over the past 20 years, applications of the drift diffusion model (DDM) have advanced cognitive-aging research by identifying age differences in component processes of perceptual and memory-based
decisions. The classic DDM assumes that fast binary decisions are based on an evidence-accumulation process with Gaussian noise. However, recent research suggests that young-adult data are sometimes better characterized by so-called Lévy-flight models with heavy-tailed noise distributions, which produce occasional extreme jumps in the accumulation process (Voss et al., 2019). Jumpy information accumulation causes fast errors, but may be adaptive in contexts that reward exploration. In the current study, we examined age differences in decision processes in the context of a letter-number discrimination task. Healthy younger and older adults completed easy and hard versions of the task. Accuracy and RT analyses showed expected effects of age and difficulty. In the difficult task, younger and older adults’ performance was best described by the standard DDM. In the easy task, older adults’ data were also well captured by the standard DDM, whereas younger adults showed the Lévy pattern. Furthermore, in younger adults, “jumpiness” was negatively associated with mean drift and boundary separation. The easy task also produced age differences in other parameters. Compared to younger adults, older adults showed longer nondecision times, wider boundary separation, and – surprisingly – higher drift rates. The current findings are the first to show that Lévy flights are more characteristic of decision making in younger than in older adults, and they constrain hypotheses about physiological and psychological correlates of “jumpy” decisions.

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23: Individual differences in episodic detail generation in older adults
Poster Session: A
Presenter: Stephanie Matijevic, University of Arizona
Keywords: Autobiographical Memory
Abstract: When describing events from memory, older adults typically provide less episodic details than younger adults. This finding is well-replicated, whereas age-related change and inter-individual variation in episodic detail generation within older adults is less understood. One possible factor driving individual differences is Apolipoprotein ε4, as Grilli et al. (2018) reported reduced episodic detail generation in older adult ε4 carriers. The present study examines how age and APOE ε4 influence episodic detail generation in a group of 41 older adults (ages 52-81, mean age 69, 15 ε4 carriers). In a modified Autobiographical Interview (Levine et al., 2002), participants’ descriptions of 3 specific event memories were coded for episodic details. Episodic specificity was calculated as the proportion of episodic:total details. Age and ε4 status interacted to predict episodic specificity ($\beta = 0.32, p = 0.034$; model adj. $R^2 = 0.23$), as age was negatively associated with details in ε4 carriers only. For total amount of episodic details, main effects of age ($\beta = -0.42, p = 0.005$) and ε4 status ($\beta = 0.34, p = 0.018$; model adj. $R^2 = 0.24$) were significant, with decreased detail associated with increasing age and ε4. These results suggest that APOE ε4 influences episodic detail generation in older adults, and that ε4 may confound the impact of age on episodic specificity. As participants also underwent resting state fMRI and DTI scans, we plan on examining whether connectivity between the hippocampus and other default mode regions may also contribute to individual differences in episodic detail generation.

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24: Comparing Random versus Alternating-Runs Switch Costs in Younger and Older Adults using the CV/OE Switch Task

**Poster Session:** A

**Presenter:** Nicholas P Maxwell, The University of Southern Mississippi

**Keywords:** Decision making, Attention, Task-Switching

**Abstract:** The Consonant-Vowel Odd-Even task (CVOE, Minear & Shah, 2008) is a simple task-switching paradigm that allows measurement of both local and global task switching costs. Participants are shown a bivalent stimulus (e.g., D 42) and are asked to classify the letter (consonant/vowel) or the number (odd/even). Previous work by Huff, Balota, Minear, Aschenbrenner, and Duchek (2015) has shown that global switch costs (i.e., mean error rates and RTs for switch trials compared to pure trials) increase as a function of age. However, older adults show fewer local switch costs (i.e., performance on switch vs non-switch trials within switch blocks) for RTs relative to younger adults, suggesting that they are less tuned to the task. Prior research has only investigated this using an alternating runs sequence to present switch trials, in which subjects complete the same task twice before the instructions switch to the second task (i.e., CV, CV, OE, OE, CV, CV). The present study expands upon this by introducing a novel switch task that presents stimuli randomly with no discernable pattern (i.e., CV, OE, OE, OE, CV, OE). Consistent with previous findings, we show that older adults have higher RTs relative to younger adults across all task types. Furthermore, older adults showed fewer local switch costs, but only when stimuli were presented using alternating runs. These results are consistent with findings that older adults are less tuned to changing task sets, thus resulting in minimal costs on switch trials.

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25: Are old cats equally curious? An examination of morbid curiosity in young and older adults

**Poster Session:** A

**Presenter:** Cynthia May, College of Charleston

**Keywords:** Emotion and Affect, Curiosity, Positivity Effect, Applied Cognition

**Abstract:** Curiosity drives us to seek out information and know the unknown. It can enhance the human experience by encouraging discovery and improving learning and retention. However, morbid curiosity can lead to unpleasant experiences, as research shows that young adults will intentionally experience a shock, smell foul odors, and view negative images simply to satisfy their curiosity. There is reason to suspect that morbid curiosity may diminish with age, as sensation seeking decreases with age and older adults tend to prioritize positive over negative information. Our research assessed morbid curiosity in young and older adults across different contexts. We examined whether the choices offered to participants affected the likelihood that they would willingly experience something unpleasant to satisfy their curiosity. In the basic paradigm, participants saw a mysterious cue (for example, a question mark on a computer screen), and were given the choice to experience (or not experience) the stimulus "behind the question mark." Participants knew that the mysterious stimulus would be unpleasant (e.g., a picture of a dirty toilet; the sound of a crying baby). If participants opted not to experience the stimulus, they saw a blank screen and sat in silence. If they opted to experience the stimulus, they saw or heard something unpleasant. In these contexts, curiosity was surprisingly strong for both young and old. However, in several follow-up studies, we manipulated participants’ choices and found that older adults were more
sensitive to alternatives than were young adults, and showed a greater willingness to abandon their morbid curiosity.

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26: Why do older adults avoid retrieving prelearned information from memory?

Poster Session: A
Presenter: Geoffrey L McKinley, Georgia Institute of Technology
Keywords: Strategy Use, Skill Acquisition, Memory, Metacognition, Associative Memory
Abstract: Older adults often avoid retrieving information from memory, even for learned information, if memory retrieval processes are not required by the task. In this study, older and younger adults engaged in multiple blocks of a noun-pair lookup task in which participants could choose to rely on their memory, or scan a table in order to verify whether a pair was intact or not. Prior research shows that mixing pre-learned items with new items suppresses use of the memory retrieval strategy by older adults, even for pre-learned items (Hines, Hertzog, & Touron, 2012). As in that study, we had people learn half of the word pairs before being given the noun-pair lookup task. In addition, half of the participants were cued prior to each stimulus about whether the pair had been learned in the prior phase, or not, to test the hypothesis that impairments in identifying whether an item had been pre-learned contributes to retrieval avoidance. They then completed 12 blocks of noun-pair trials, and we observed increases in retrieval strategy use, measured by an explicit choice to see the look-up table or to respond without the look-up table. Next, a cued recall test assessed associative memory for the pairs. For older adults, cueing on prior study history increased retrieval use as well as performance on the cued recall test. These data are discussed in comparison to retrieval behavior for younger adults. We also consider the impact of retrieval use on learning by comparing performance on a subsequent memory test.

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27: How Early Life and Recent Life Stress Exposure Shapes Cortisol Reactivity and Decision Making in Midlife-to-Older Adulthood

Poster Session: A
Presenter: Sara D McMullin, Saint Louis University
Keywords: Decision making, Aging, Stress, Physiology, Experimental
Abstract: Experiencing chronic stress is related to poor mental and physical health outcomes. Different models emphasize timing of chronic stress in the lifespan as a key factor. The effects of lifetime stress exposure as well as the acute experience of stress may both lead to poor decision making. Greater lifetime stress exposure is also paradoxically associated with a blunted physiological response to acute stress. Therefore, research investigating stress and decision making should not only measure responses to acute stress, but also lifetime stress exposure to better understand individual differences in decision making under stress. This study is testing current life stress models to see which best predicts stress reactivity and decision making within a sample of 160 middle-to-older aged adults. Lifetime stress exposure is measured using the Stress and Adversity Inventory which is a comprehensive measure of stress occurring across the lifespan from early childhood stressors to more recent stressful events. Salivary cortisol is assessed to
measure acute stress reactivity. Participants are also completing a decision making task before and after an acute stressor, to compare decision making performance with and without acute stress. We predict that greater early life stress and recent stress will be related to poorer decision making and blunted stress physiology in older adults. The study will be completed by February 2020 with current recruitment at N = 40. Overall, results of this study will inform how acute and lifetime stress impacts decision making in older adults, specifically financial decisions like those made in the real-world.

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28: How do episodic cues affect the discounting of delayed and probabilistic rewards by young and older adults?

Poster Session: A
Presenter: Jenkin NY Mok, York University, Baycrest Health Sciences

Keywords: Decision making, Episodic Memory, Intertemporal Choice, Probability Discounting, Future Imagining

Abstract: Remembering and imagining specific, personal experiences can help shape our decisions. For example, cues to imagine future events can reduce delay discounting (i.e., increase the subjective value of future rewards). It remains unclear, however, whether there are age-related differences in the effects of cueing. It also is not known whether such cues can modulate other forms of reward discounting, such as probability discounting (i.e., the decrease in the subjective value of a possible reward as the odds against its occurrence increase). Accordingly, young and older adults were administered delay and probability discounting tasks both with and without cues to imagine specific, personally meaningful events. Cued episodic imagining decreased the discounting of delayed rewards by participants across both age groups. Notably, however, this effect was significantly less pronounced in older adults. In contrast to the effects of cueing on delay discounting, cued episodic imagining had little or no effect on the discounting of probabilistic rewards in either young or older adults; Bayesian analysis revealed compelling support for the null hypothesis that episodic cues do not modulate the subjective value of probabilistic rewards. In sum, imagining future events appears only to affect decisions involving delayed rewards. Although the cueing effect is smaller in older adults, these findings open the doors to understanding how episodic cues can contribute to the evaluation of delayed rewards in all adults, regardless of age.

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29: Does social support protect against cognitive deficits post-stroke? Findings from the CLSA

Poster Session: A
Presenter: Cassandra Morrison, School of Psychology, University of Ottawa, Ottawa, Canada, Bruyère Research Institute, Ottawa, Canada

Keywords: Vascular Cognitive Impairment/Stroke, Cognitive Reserve

Abstract: Post-stroke cognitive impairment affects two-thirds of people who experience a stroke. Cognitive impairments following a stroke can impact a variety of domains such as attention, memory,
language, executive functioning, motor control, and processing speed. The severity of this decline will vary between individuals due to factors such as severity of the stroke, the brain region affected by the stroke, and even individual differences in cognitive reserve (CR). Past research has shown that high levels of education, social and emotional connections enhance CR, protecting individuals from cognitive declines after stroke. While some studies have examined the effects of CR factors on those recovering from a stroke, research has yet to determine which factors have the most beneficial effect on cognitive outcomes post-stroke. We used data from the Canadian Longitudinal Study on Aging, a nationwide study on health and aging involving individuals between the ages of 45–85, to examine the effects of education, social and emotional support, sex, age, and depression on cognitive functioning in post-stroke individuals. It is predicted that increased education, social and emotional support will mitigate stroke-related cognitive impairment. By identifying factors that may help with cognitive recovery following a stroke, these findings may help clinicians develop more complex care plans and individual interventions specific to each client’s needs.

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30: Do older adults worry less about “tempting fate”?

Poster Session: A
Presenter: Kristi S Multhaup, Davidson College
Keywords: Reasoning, Decision making, Magical Thinking, Applied Cognition, Everyday Cognition
Abstract: People are reluctant to tempt fate – for example, they believe that choosing to leave an umbrella at home increases the chances of rain. We recently found that magical thinking (e.g., belief in superstitions) decreases with age. The present study explores whether older adults also worry less about tempting fate than their young counterparts. Young (n = 111) and older (n = 97) participants read scenarios in which the protagonist tempted fate (wore a t-shirt from a university they hoped to get into) or not (stuffed the t-shirt in a drawer instead). Then all participants rated the likelihood that the university would accept the student’s application. Young adults showed the classic illusion, where a positive outcome (acceptance) seemed less likely after tempting fate. Older adults, on the other hand, gave similar estimates in the tempting fate and control conditions. After additional tasks, participants responded to two more scenarios – in one case, both age groups showed a reluctance to tempt fate and in the other, neither did. We are currently replicating this work with new samples and without intervening questions that could influence judgments.

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31: Keep up the Pace: Decline in simple repetitive timing is sensitive to Alzheimer’s disease Tau accumulation in healthy control individuals

Poster Session: A
Presenter: Jessica Nicosia, Washington University in St. Louis
Keywords: Alzheimer’s Disease, Attention, Longitudinal
Abstract: One important goal in cognitive aging research is to distinguish between normal age-related declines and those associated with Alzheimer’s disease (AD). One simple task that is sensitive to early AD-related changes is the continuous tapping task where participants to first synchronize their taps to a slow metronome beat and then continue tapping at that rate once the metronome signal disappears until they
are cued to stop (~2 minutes). Participants must maintain the tapping rate representation in working memory and focus on the task goal to maintain the target tapping rate over time. In a large, longitudinal sample of individuals collected at the Knight Alzheimer’s Disease Research Center, we examined baseline differences, longitudinal changes, and sensitivity to AD biomarkers. Baseline comparisons showed reliable age- and AD-related differences in tapping performance variability (indexed by the coefficient of variation, COV). Longitudinal analyses of nondemented individuals yielded a significant time by tau interaction suggesting that individuals with greater tau accumulation (as measured by a PET tau tracer) showed an increase in tapping variability over time compared with low tau individuals. Stepwise binary logistic regression models also indicated that tapping COV increased discrimination between non-demented individuals and very mildly demented individuals better than 14 of the 16 psychometric measures available on these participants. These results suggest that performance variability on a short, simple tapping task may be sensitive to the earliest stages of AD and, importantly, AD biomarkers in healthy control individuals.

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32: Changes in memory self-efficacy of older adults by working memory span tasks in a group

**Poster Session:** A

**Presenter:** Kazunori Otsuka, University of Nagasaki

**Keywords:** Metacognition, Working Memory, Everyday Memory, Individual Differences

**Abstract:** Changes in memory self-efficacy of older adults were investigated by examining short-term, and working memory span scores; as well as relationships between memory self-efficacy (MSE), short-term memory span, working memory span and the number of memory aids used in everyday life. Older adults (N = 148) responded to the pre- MSE Scale, word span tasks, position span tasks, symmetry span tasks and the post- MSE Scale, and also reported on daily life memory aids they use, in that order. The results indicated that the mean post- MSE scale score was significantly lower than the mean pre- MSE score. Moreover, there were significant positive correlations between post MSE scores, the number of daily life memory aids, and memory span. These results suggest that older adults’ memory self-efficacy changes from being irrelevant to relevant as a result of taking short-term group memory tests.

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33: Autobiographical memory and descriptions of routes within familiar environments in older adults with and without memory impairment

**Poster Session:** A

**Presenter:** Sara Pishdadian, York University, Rotman Research Institute/ Baycrest Health Sciences

**Keywords:** Autobiographical Memory, Spatial Memory, Hippocampus, Episodic Memory, Mild Cognitive Impairment

**Abstract:** Past research shows that individuals with amnestic Mild Cognitive Impairment (aMCI), a condition characterized by memory deficits and hippocampal compromise, generate fewer episodic details relative to semantic details of personal memories. Studies assessing spatial memory have found that individuals with hippocampal amnesia generate lower proportions of episodic or perceptual details
compared to the more schematic, semantic-like details in verbal descriptions of familiar environments. Both findings are consistent with the Multiple Trace Theory, which proposes that episodic, detailed re-experiencing of memories always relies on the hippocampus, whereas more schematic aspects are represented in neocortical areas. It has yet to be determined whether memory for spatial details contained within remotely learned environments are affected in aMCI. We investigated this question by testing older adults on the route description task and an abbreviated form of the Autobiographical Interview (AI). Participants were divided by presence or absence of objective memory impairment confirmed with neuropsychological testing. Current results indicate that older adults with memory impairments, several of whom had a clinical diagnosis of aMCI, did not differ from healthy older adults in proportion of episodic details generated within their route descriptions. By contrast, older adults with memory impairments generated fewer overall number of details and rated their re-experiencing of their environments as less vivid than their non-memory-impaired counterparts. These results suggest that episodic detail generation within remote spatial memory may differ from hippocampal amnesia, and non-hippocampal structures may mediate the generation of these details while the vivid re-experiencing of memories remains reliant on hippocampal structures.

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34: The Relationship of APOE ε4 to the Relative Times and Hazards of Dementia

Poster Session: A
Presenter: Danielle S Powell, Johns Hopkins University- Bloomberg School of Public Health
Keywords: Cognitive Decline, Dementia, Methods, Alzheimer’s Disease, Genetics
Abstract: We aim to evaluate the effect of the APOE ε4 allele on time to and risk of dementia, accounting for the competing risk of death using a longitudinal study of 10,400 white-race individuals in the ARIC cohort followed from age 60 to incident dementia diagnosis, death, or censoring. All-cause dementia was defined using standard algorithms incorporating longitudinal cognitive change, proxy report, and hospital or death certificate dementia codes. We used a mixture of generalized gamma distributions, a parametric modelling technique, to simultaneously estimate the distribution of event times and the proportion of individuals who experience each outcome (i.e., dementia and its competing risk, dementia-free death) by APOE ε4 status (was modeled as ≥ 1 allele vs. no alleles). Age-adjustment was through use of age as the time scale. APOE ε4 carrier status modified the mixture of distributions by doubling the overall frequency of dementia incidence to 25% compared to 13% (p < 0.001) in non-ε4 carriers. The distributions of time to dementia was modified by APOE ε4 status (p=0.007). Median time to dementia onset among APOE ε4 carriers is 81.9 years compared to 83.3 years in non-APOE ε4 carriers (p = 0.005). No differences in results were found by sex. Therefore, using a mixture approach to competing risks, APOE ε4 carrier status was associated with not only increased risk but also earlier time to dementia in older adults. Identification of earlier time to dementia for ε4 carriers beyond increased risk allows for improved family, provider, or investigator planning.
Authors:
Danielle S Powell, Johns Hopkins
Perry Kuo, Johns Hopkins
Jennifer Deal, Johns Hopkins
35: Alzheimer’s disease disrupts domain-specific and domain-general mechanisms in numerosity estimation.

**Poster Session: A**

**Presenter:** Angélique AR Roquet, Laboratoire de Psychologie Cognitive, Aix-Marseille University & CNRS

**Keywords:** Alzheimer’s Disease, Numerosity Estimation, Dot Comparison, Numerosity Processing, Cognitive Control

**Abstract:** The present study aimed at investigating how Alzheimer disease’ affects numerosity estimation abilities. Numerosity estimation refers to the ability to find the approximate number of items in a collection or to compare collections of items based on their numerosity. It involves two types of cognitive mechanisms, specific mechanisms (e.g., numerosity representations) and general mechanisms (e.g., inhibition). Our objective was to determine whether declines in numerosity estimation during Alzheimer’s disease come from impairment in domain-specific (i.e., numerosity processing) and/or domain-general (i.e., inhibition) mechanisms. To achieve this end, HOA (i.e., Healthy Older Adults; N=48) and AD (i.e., Alzheimer Disease; N=50) participants accomplished (a) numerosity estimation and comparison tasks (i.e., dot comparison and number-line tasks), and (b) a general cognitive conflict task (i.e., Simon task) in two experiments. Our findings showed that numerosity abilities decline in AD patients, and that this decline results from impaired domain-specific and domain-general mechanisms. These findings have important implications to further our understanding on how specific and general cognitive mechanisms contribute to numerosity estimation performance and how such contributions change during Alzheimer’s disease.

**Authors:**
Angélique Roquet, LPC & CNRS
Bernard Michel, St-Marguerite Hospital
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36: Older Adults May Be More Effective in Making Risky Decisions Than Younger Adults: The Role of Precise Feedback

**Poster Session: A**

**Presenter:** Klara Rydzewska, Interdisciplinary Center for Applied Cognitive Studies (ICACS), SWPS University

**Keywords:** Decision making

**Abstract:** A number of decision-making research results point to a deteriorated task performance of older adults compared to young adults. Despite the clear and monotonic decline in basic cognitive functions (such as processing speed, working memory and fluid intelligence) throughout adulthood, older adults use a variety of compensatory mechanisms. Such compensatory mechanisms may include cognitive strategies (e.g., integration of available pieces of information into situational mental models, not just remembering such information from memory) and motivational strategies (e.g., more targeted investment of resources).

Research participants from two (study 1) and three (study 2) age groups were asked to decide when to stop a moving animated car. The aim of the task was to drive for as long as possible before the tire broke (which could happen at any given moment). After each successful drive, precise feedback was presented indicating distance that could have been driven before breaking the tire. Successful drive, without breaking the tire, was also rewarded with points.

In this computerized risky choice task, completely novel for participants, older adults outperformed
younger and middle aged adults. Possible explanation of such results could be found in cardiovascular indices, indicating possible age differences in motivation.

Authors:
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Maciej Koscieniak, ICACS, SWPS University
Grzegorz Sedek, ICACS, SWPS University

37: The influence of personality traits on sleep quality across the adult life span: the role of sleep-related metacognitive beliefs
Poster Session: A
Presenter: Enrico Sella, Department of General Psychology, University of Padova, Italy
Keywords: Personality, Metacognition, Sleep Quality, Adult Lifespan
Abstract: Personality has emerged as an important predictor of sleep quality across the adult lifespan. There is also evidence that subjective sleep-related factors (i.e., dysfunctional beliefs and attitudes about sleep, and metacognitive beliefs about sleeping difficulties) can negatively impact sleep quality. This study aimed to investigate the relationship between age, personality, subjective sleep-related factors and both self-reported and objectively-measured sleep quality.

One hundred and twenty-two healthy participants (from 18 to 74 years of age) completed the Big Five-60. Dysfunctional beliefs and attitudes about sleep, and metacognitive beliefs about sleeping were assessed with the Dysfunctional Beliefs and Attitudes about sleep (DBAS), and Metacognitions Questionnaire-Insomnia (MCQI), respectively. Subjective sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI), while objective sleep quality by 7 days of actigraphic recording.

Results from path analyses showed that age had a negative direct effect on self-reported sleep quality. Then, personality, and in particular Emotional Stability, had a negative indirect effect on self-reported sleep quality, which was fully mediated by metacognitive beliefs about sleeping difficulties. In contrast, objective sleep quality was not associated with age, personality and subjective sleep-related factors.

These findings suggest that within subjective sleep-related factors, metacognitive beliefs about sleeping difficulties have a crucial role - independently from age - in explaining the relationship between personality and greater self-reported sleeping difficulties.

Authors:
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Enrico Toffalini, University of Padova
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38: Age-Related Differences in Local and Global Metacognitive Accuracy in a Visuospatial Selectivity Task
Poster Session: A
Presenter: Alexander LM Siegel, University of California, Los Angeles
Keywords: Memory, Visuo-Spatial Abilities, Associative Memory, Metacognition, Spatial Memory
Abstract: The current study examined how different types of metacognitive judgments may differ between younger and older adults in the presence of important information. While older adults may be equally as accurate as younger adults when making item-by-item judgments of learning (JOLs), when asked to make predictions about performance on an entire set of items, older adults may exhibit
overconfidence reflecting difficulty in the application of local item monitoring to a global assessment. We intended to study this distinction in a visuospatial memory context and determine whether these assessments may be influenced by the value of information. Participants studied items paired with point values indicating their importance within a grid display and were asked to maximize their point score (a summation of the points associated with correctly recalled locations) across a series of trials. Metacognitive measures collected were two-fold: item-level, local confidence judgments in the accuracy of an item placement and trial-level, global estimates of the number of correctly placed items in the grid. In addition to recalling a higher proportion of item locations, younger adults were more accurate in both their local and global metacognitive estimates. Older adults’ estimates became more accurate across trials, suggesting they benefitted from task experience and feedback. With regards to information importance, neither age group’s recall nor confidence ratings were influenced by item value. These findings add to the literature on local and global metacognitive accuracy and aging and suggest that the addition of a metacognitive task may reduce selectivity in some circumstances.

Authors:
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Shawn T. Schwartz, University of California, Los Angeles
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39: Cognitive Impairment following single mild traumatic brain injury with loss of consciousness: Predictors of long-term outcomes

Poster Session: A
Presenter: Vanessa Taler, University of Ottawa
Keywords: Mild Traumatic Brain Injury, Cognitive Impairment, Predictors

Abstract: Background: Mild traumatic brain injuries (mTBI) are a common occurrence, yet little is known about their effects on long-term cognitive functioning. We examined the extent to which a single mTBI with loss of consciousness (LOC) a year or more ago may be associated with cognitive impairment. Informed by findings suggesting that greater social support may buffer against brain pathology, we examined whether social support acts as a protective factor against impairment.

Participants and Methods: Data were acquired from the Canadian Longitudinal Study on Aging (CLSA), and included 989 individuals with one life-time mTBI that occurred more than 12 months prior, 548 of whom reported < 1 minute LOC, and 441 LOC between 1-20 minutes. Comparisons were 13,609 cognitively healthy adults. Analyses included tests of executive functioning, episodic memory, and the MOS Social Support Survey. Impairment status was defined as scoring 1.5 or more standard deviations below comparison group means.

Results: Those who reported LOC of 1-20 minutes were 1.6 times as likely to be impaired on 3 or more cognitive indices as those with LOC of < 1 minute. Increased emotional social support provided a buffer against cognitive impairment.

Conclusions: A single mTBI with longer time spent unconscious may be associated with larger odds of cognitive impairment in the long term, and social support, particularly emotional support, may be an important protective factor.

Authors:
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40: Memory for Decisions Across the Lifespan

**Poster Session:** A  
**Presenter:** Morgan K Taylor, Duke University  
**Keywords:** Memory, Decision making  
**Abstract:** Much research has focused on how older adults (OAs) make decisions, especially in medical and financial situations. However, it is just as important to understand how OAs remember those decisions. Some studies have revealed that OAs are more inconsistent than younger adults (YAs) in their decision-making—they make a different choice upon encountering the same decision more than once. We propose that memory failure is at the root of age-related inconsistencies in decision-making. In the current study, 217 Qualtrics panels participants from across the lifespan (20-90 years old) completed a consumer choice task. The task involved 1) choosing between two products and 2) later remembering which product they chose. In the decision part of the task, participants saw the first of two products (e.g. WATCH 1) paired with a 1-5 star rating. Zero, two, or four trials later, they saw the second product (WATCH 2) and its accompanying rating. Participants had to choose the product with the higher rating, requiring them to recall the first product’s rating while the second product was on the screen. Surprisingly, we found no age differences in decision performance or memory accuracy; OAs were just as likely to choose the correct product as YAs, likely explaining why they remembered their decision as well as YAs. This suggests that active encoding via retrieval practice may boost memory performance to such a degree that OAs match YAs behaviorally. The roles that contextualization and motivation play in one’s memory for decisions will also be discussed.  
**Authors:** Morgan K. Taylor, Duke University  
Elizabeth J. Marsh, Duke University  
Gregory R. Samanez-Larkin, Duke University

41: Dispelling the belief that human memory works like a videorecorder: Older adults correct misconceptions related to psychological knowledge

**Poster Session:** A  
**Presenter:** Ayanna K Thomas, Tufts University  
**Keywords:** Episodic Memory, Metacognition, Learning  
**Abstract:** Learning new, correct information in the context of strongly-held misconceptions presents a challenge for individuals of all ages, yet the evidence is mixed regarding the way age-related cognitive changes impact the updating process. For example, older adults demonstrate poorer memory for information inconsistent with their own erroneous beliefs about osteoarthritis. However, when older adults have access to and rely on relevant domain knowledge, their ability to correct misconceptions improves. The present work examined how confidence in misconceptions and control over access to correct information impacted knowledge updating in younger and older adults. In a first experiment, young and older adults took a TRUE/FALSE test of 50 psychology misconceptions. Participants reported confidence in the correctness of their response, then were shown immediate corrective feedback (i.e., the correct answer) and a detailed explanation elaborating on the correct answer. A surprise retest occurred one week later. Both groups demonstrated a poor relationship between confidence and initial test performance. However, both groups were effective in updating knowledge based on the corrective feedback. In a second study, older adults selected items for which they wanted to receive more information (i.e., a detailed explanation of the correct answer). Selections were either honored and participants were given detailed explanations for the information selected or dishonored and participants
were given a detailed explanation for information not selected. Results suggest effective regulation of learning, as updating was greater when choices were honored. Older adults’ preserved ability to update strongly-held misconceptions will be discussed within the context of access to domain knowledge, and the ability to exercise metacognitive control over learning.

**Authors:**
Ayanna K Thomas, Tufts University
Renee DeCaro

42: Comparing the accuracy of the DCTclock and Montreal Cognitive Assessment to detect elevated cerebral amyloid in cognitively normal adults at increased genetic risk for Alzheimer’s disease.

**Poster Session:** A

**Presenter:** Louisa I Thompson, Brown University, Butler Hospital

**Keywords:** Alzheimer's Disease, Assessment, Technology Adoption

**Abstract:** Sensitive and non-invasive methods of screening for early stage Alzheimer’s disease (AD) are urgently needed. Digital assessment tools have the potential to improve the efficiency and accuracy of cognitive screening for older adults in both clinical and research settings. The DCTclock uses a digital pen to capture traditional clock drawing test performance and advanced analytics to evaluate the drawing process for indicators of cognitive difficulty. Prior studies have shown that DCTclock performance is inversely associated with cortical amyloid (Aβ) burden in older adults. Here we compare the DCTclock to the Montreal Cognitive Assessment (MoCA), a gold standard cognitive screening test, in a sample of 73 cognitive normal older adults (N=73) and investigate which measure is more accurate in predicting Aβ PET status in a subgroup of APOE e4 carriers (N=30). In the overall sample, MoCA total score was modestly correlated with DCTclock total score (r = 0.24, p = 0.04), as well as DCTclock command condition Drawing Efficiency and Information Processing composite scores. In the Aβ PET subgroup, ROC analysis indicated that the MoCA had superior accuracy in differentiating Aβ PET status (AUC = 0.79) relative to the DCTclock (AUC = 0.57). Of the various DCTclock composites scores, Spatial Reasoning had the greatest accuracy in differentiating Aβ PET status (AUC = 0.62). However, composite of the MoCA and DCTclock Spatial Reasoning scores improved accuracy over the MoCA alone (AUC = 0.85), suggesting that the co-administration of these tests may still be worthwhile to improve overall accuracy to predict Aβ PET status.

**Authors:**
Louisa I. Thompson, Brown University, Butler Hospital

43: No Need for Direct Genotyping of APOE? Comparison of Directly Genotyped Versus Imputation Based APOE Epsilon Allele Status

**Poster Session:** A

**Presenter:** Eero Vuoksimaa, Institute for Molecular Medicine Finland (FIMM), University of Helsinki, Finland,

**Keywords:** Genetics, Alzheimer's Disease, Methods

**Abstract:** Studying and including information about apolipoprotein E (APOE) gene, the most robust single gene associated with the risk of Alzheimer’s Disease (AD), is important in cognitive aging studies. APOE has traditionally been determined by directly genotyping two single nucleotide polymorphisms (SNPs) in Chromosome 19, namely rs429358 and rs7412. Genome-wide arrays can be used to impute non-measured variants making it possible to get information about APOE genotype even in the absence of directly genotyped rs429358 and rs7412. We compared directly genotyped versus imputation based APOE status in a sample of 1704 Finnish participants. We used three different reference panels: 1000 Genomes Phase III v5 (1000G), Haplotype Reference Consortium r1.1 (HRC), and Finnish specific Sequencing
Initiative Suomi (SISu) using Illumina HumanCoreExome array. We found high accuracy with all reference panels. With 1000G 1701/1704 individuals had correctly classified alleles in both SNP’s. In HRC and SISu, 1702/1704 and 1703/1704 individuals had correctly classified rs429358 and rs7412, respectively. Based on HRC reference panel, 99.88% had correctly classified APOE genotype and ε4 carrier status. Only two individuals had inconsistent ε4 status between directly genotyped and imputation based information. Our results suggest that for research purposes APOE status can be determined from imputation based information as a part of genome-wide arrays. Moreover, genome-wide data allows to study polygenic nature of AD and makes it possible to use AD polygenic risk scores in cognitive aging studies.

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44: Aging and experience may moderate the effect of disclosure forms on decision making

Poster Session: A
Presenter: Xiaqoing Wan, University of Central Florida
Keywords: Decision making, Cognitive Decline, Applied Cognition, Learning
Abstract: Government-mandated disclosure forms serve as a popular regulatory tool to protect consumers from conflicts of interest. However, the actual impact of such forms has been a subject of debate. Key criticisms of disclosure forms include the use of legal jargon and excessive length. Previous research shows that older adults experience declines in working memory and verbal learning, both of which predict reading comprehension. Due to these age-related impairments, older adults may be vulnerable to disclosure forms that contain verbiage and legalese. An alternative possibility is that older adults have more life experience, which may help them better utilize the information on disclosure forms. The current study tested these two hypotheses in a controlled experiment, using a recently mandated financial disclosure form that is designed to help individuals choose the optimal investment services. Post intervention, our results showed that older adults used the disclosure form to make better decisions, but younger adults did not. Age was significantly associated with more investment experience, which may have allowed older adults to better integrate information from the disclosure form to improve decision making. These findings suggest that experience may enhance the effectiveness of disclosure forms on decision making, mitigating potential impairments from cognitive aging.

Authors:
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45: Older Age is Related to Decreases in Autobiographical Memory Sharing in Everyday Conversations

Poster Session: A
Presenter: Aubrey A Wank, University of Arizona
Keywords: Autobiographical Memory, Everyday Memory
Abstract: Laboratory-based studies of autobiographical memory (AM) have suggested that retrieving autobiographical thoughts, including specific autobiographical events, serves a variety of adaptive functions in daily life. These studies have also found that older age is associated with lower episodic specificity, which encompasses both a reduction in retrieval of specific autobiographical events and
reduced episodic detail generation. In light of the importance of autobiographical thought to daily life, the goal of the present study was to examine in older adults the outward retrieval of AMs in the real-world, using a naturalistic observation approach. Secondary data analysis of autobiographical content was conducted on a sample of cognitively normal older adults (age 65 to 90) who wore the Electronically Activated Recorder, a device that unobtrusively captures 30-second audio fragments of daily life, including conversations. We identified sound files containing the natural sharing of AMs and scored these memories to examine whether age was related to the frequency of real-world AM sharing and the episodic specificity of these memories. Results revealed that increased age was associated with decreased real-world AM sharing, independent of the total number of conversations with others. Interestingly, age was not related to the frequency of episodic AM sharing specifically. However, there was a negative relationship between age and total details provided while sharing episodic memories and this effect was primarily driven by an age-related decrease in episodic details. These findings build on laboratory-based studies by showing that age is related to the real-world sharing of AM and episodic specificity.

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46: Mnemonic similarity task performance is associated with PET beta-amyloid deposition in healthy older adults

Poster Session: A
Presenter: Christina E Webb, The University of Texas at Dallas
Keywords: Memory, Beta-Amyloid, Pattern Separation

Abstract: The ability to store distinct memory representations in the face of a high degree of similarity, a process known as pattern separation, is reduced in older age. One common approach to understanding hippocampal-based memory discrimination is by testing performance on a mnemonic similarity task that taxes hippocampal pattern separation processes. Various biological and genetic factors influence episodic memory performance in aging, including accumulation of beta-amyloid. However, investigation of amyloid effects on mnemonic discrimination is limited. Thus, in this study we examine associations between PET-measured beta-amyloid burden and performance on a spatial mnemonic similarity task in group of healthy older adults (N = 37, aged 55-98 years old). During encoding, participants studied pictures of everyday items in various locations on a computer screen. At retrieval, they were presented with both studied and new items, as well as similar lure items that varied in the degree of similarity to the studied exemplar. Accurate lure discrimination involved identifying lures as being similar, but not exact, to that which was studied. Results of a linear mixed model showed independent effects of beta-amyloid on the slope of mnemonic discrimination across levels of lure similarity, above and beyond effects of age or APOE-e4 status. Specifically, greater beta-amyloid in older adults was associated with a reduced slope of lure discrimination across increasingly distinct lures. These results suggest that even subtle elevation in beta-amyloid burden in cognitively normal older adults negatively affects hippocampal pattern separation processes that support discrimination of highly similar memory representations.

Authors:
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47: Age-Related Differences in Metacognition and Memory for Realistic Associative Information

**Presenter Session: A**

**Presenter:** Mary C Whatley, University of California, Los Angeles

**Keywords:** Associative Memory, Metacognition, Cognitive Control

**Abstract:** Older adults typically show a specific deficit for remembering associative information, but age-related differences can be reduced or eliminated when information is consistent with prior knowledge (i.e., schematic support). However, it is unclear what role metacognitive processes play in this effect. While older adults may have intact monitoring abilities, they do not always spontaneously engage in effective control strategies to improve memory performance. The current study examined age-related differences in metacognitive processes and whether differences in metacognition influenced memory performance for realistic associative information. Participants studied common grocery items paired with prices that were either market-value (schema-consistent) or overpriced (schema-inconsistent). Participants studied at their own pace and were tested on the exact price of each item over four study-test lists with new items on each list. There were no age differences in self-paced study time, but participants studied overpriced items longer than market-priced items, consistent with a discrepancy reduction model of self-regulated learning. In addition, item value (i.e., market or overpriced), age, and list position all significantly predicted recall at the item level, but study time did not. The results suggest a labor-in-vain effect, such that studying items longer did not improve memory performance for younger or older adults. In addition, younger adults showed greater overall memory performance despite similar study time as older adults, suggesting that older adults do not engage in effective strategies during self-paced study and that the benefits of schematic support may not be dependent on the strategic allocation of study time.

**Authors:**

Mary C. Whatley, University of California, Los Angeles

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48: Tracking mnemonic interference in time and space across age

**Presenter Session: A**

**Presenter:** Audrey Duarte, Associate professor, Georgia Institute of Technology

**Keywords:** Alzheimer’s Disease, Cognitive Decline, Neuroscience: Functional, Neuroscience: Structural, Dementia

**Abstract:** Aging is associated with declines in episodic memory accuracy. One contributor to this decline may be increased susceptibility to interference from not currently relevant memories competing with one’s ability to encode or retrieve new information. Such interference may block or delay access to sought after memories. Using parallel fMRI and EEG methods coupled with multivariate pattern analyses, we investigated whether neural activity patterns show greater evidence of mnemonic interference in aging and if this contributes to age-related memory impairments. Event-related fMRI or EEG was recorded as young and older adults studied new associations between objects and faces or scenes and retrieved these associations under different levels of proactive interference. Results show that memory performance is impaired in the face of proactive interference particularly for older adults. Neural activity patterns suggest that spontaneous reactivation of interfering memories contributes to difficulty encoding and retrieving
new ones, across age. Results will be discussed in the context of inhibitory deficit and neurocognitive slowing theories of aging.

Authors:
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49: Apples and oranges: Inconsistencies in assessing cognitive functioning in individuals with sensory impairment
Poster Session: A
Presenter: Jennifer A. Deal, Johns Hopkins University
Keywords: Cognitive Impairment, Hearing Loss, Measurement, Visuo-Spatial Abilities, Sensation and Perception
Abstract: The measurement of both sensory and cognitive functioning is critical when assessing the relationship between sensory impairment and cognitive decline. The impact of sensory impairment on cognitive assessments is often ignored, despite the fact that standard cognitive tests rely on vision and/or hearing. The goal of this presentation is to highlight inconsistencies and potential bias in the assessment of cognitive functioning for individuals with vision or hearing impairments. This session will: (1) provide an overview of vision and hearing, including how these senses are measured, how impairment is defined, and the prevalence of these impairments; and (2) describe limitations in standardized approaches to assessing sensory impairment and cognitive function. The limitation include, inconsistencies across studies in how sensory functioning is assessed, and variability in how cognitive tests are administered to individuals with sensory impairment, as well as describe how the lack of standardization contributes to measurement variability.
Authors:
Bonnielin Swenor, Johns Hopkins University
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50: Cognitive assessment made accessible: How to measure cognition in individuals with sensory impairment
Poster Session: A
Presenter: Walter Wittich, Université de Montréal
Keywords: Cognitive Impairment, Hearing Loss, Measurement, Visuo-Spatial Abilities, Sensation and Perception
Abstract: Several tools and strategies have been proposed and designed to measures cognitive function in persons with partial or total loss of vision and/or hearing, given the importance of engaging participants in test that require verbal instructions or visual stimuli. This presentation will suggest feasible and meaningful improvements in the assessment of cognitive function in older adult populations through strategies that improve audibility of testing instructions and visibility of testing materials for cognitive screening and evaluation. In addition, some tactile alternatives will be explored. The presenter will discuss how to adapt current cognitive batteries for assessing cognitive function in individuals with sensory impairments to provide researchers with the tools to consider and include older adult participants, especially those with acquired sensory impairments in order to be able to maintain their participation in long-term research studies. Challenges to standardized administration and interpretation as well as the definition of age-normal comparison standards remain challenging. The implementation with time-consuming and costly adaptations must be balanced with the risk of losing participant assessment abilities in the face of changing sensory capacities throughout the lifespan.
Authors:
1: Layer-specific arteriovenous compliance in aging and age related cognitive slowing

**Poster Session: B**

**Presenter:** Dema Abdelkarim, The University of Texas at Dallas

**Keywords:** Neuroimaging: Functional, Health and Well Being, Vascular Cognitive Impairment/Stroke

**Abstract:** As humans age, their vasculature becomes stiffer and less responsive to vasoactive stimuli. This stiffening, however, is not equivalent throughout all levels of vasculature. The levels of cerebral vasculature start with pial arteries just outside the parenchyma, from which penetrating arteries descend into brain tissue. These penetrating arteries then multifurcate into smaller arterioles and then into even smaller capillaries. At each level, the vascular structure is distinct, and the biological factors that contribute to aging and age-related vascular pathology impact each level in different ways. We hypothesize that these level-specific effects mediate age-related changes in brain function and cognition.

In this study, we sought to ascertain whether arterial cerebrovascular reactivity (CVRa) across layers of cortex (i.e., the arterial compliance index; ACI) contributes to processing speed differences between younger and older adults. Hypercapnia gas challenge allowed us to assess cerebrovascular reactivity after inhalation of 5% CO2-room air gas. Participants inhaled room air (for 4 minutes) and gas (for 6 minutes) during fMRI scanning. We obtained the ACI, derived from CVRa in different cortical layers, to see if the decay in reactivity across layers corresponded to age-related processing speed changes in 55 healthy adults (27 younger, 28 older). Relationships between ACI and processing speed were stronger in younger adults than in older adults. The results implicate neural-vascular coupling dysfunction in age-related cognitive slowing.

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Hanzhang Lu, Johns Hopkins University
Bart Rypma, University of Texas at Dallas

2: Can Testing During Tip-of-the-Tongue (TOT) States Reduce Future TOTs?

**Poster Session: B**

**Presenter:** Lise Abrams, Pomona College

**Keywords:** Memory, Language Production

**Abstract:** The finding that testing is superior to restudying in learning, i.e., the testing effect, is well-established and has been shown to benefit older as well as younger adults. The present experiment investigated whether testing during tip-of-the-tongue (TOT) states can increase accurate retrieval of words previously susceptible to TOTs. Sixty young adults (aged 18-21) and 60 older adults (aged 61-91) were presented with general knowledge questions whose answer was a low-frequency target, and they attempted to retrieve the correct answer. If they could not, they indicated whether they were having a TOT or did not know the answer. Their knowledge of the target was then tested by (1) a multiple-choice test, where they were asked to recognize the target presented among five alternatives, or (2) a letter-by-letter stem completion test, where the target was revealed one letter at a time, and participants were asked to produce the target as soon as possible. Feedback about the answer’s correctness was given by
displaying the target and asking participants to say it aloud. Participants were shown these general knowledge questions again after a 15-minute or 7-day delay, and accuracy of target retrieval was recorded. Relative to targets not immediately tested after a TOT, both age groups demonstrated a testing effect for both types of tests. However, the benefit of testing in each age group was dependent on the delay (greater benefit at the shorter delay) and on the correctness of the response, where correct recognition or production helped target retrieval more than incorrect recognition/production.

Authors:
Genevieve Gray, Pomona College
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Lise Abrams, Pomona College

3: Commonalities and Dissociations among Predictors of Performance on Two Language Tasks in Older and Young Adults

Poster Session: B
Presenter: Lori JP Altmann, UF Department of Speech, Language, and Hearing Sciences,
Keywords: Language Production, Speech Production, Executive Function, Speed of Processing,
Abstract: Discourse studies have reported executive functions (EF) and working memory (WM) influence language production in older adults (OA); however, studies examining cognitive effects on other language production tasks are rare. Differences in task demands alter demands on cognitive resources. This study compares predictors of performance in OA and young adults (YA) on two language tasks.

Participants included 65 OA and 41 YA. They completed twelve cognitive tasks. Principle Components Analysis revealed four factors: Processing SPEED, Executive Fluency (EF-FLU), WM, and Inhibition. Participants also completed two language tasks: a 3-minute discourse (DIS) sample with autobiographical prompts and a sentence (SEN) generation task using 20 line drawings. Both tasks were scored for: total words, total ideas, idea density, production fluency, and grammaticality. Analyses employed hierarchical step-wise regressions.

EF-FLU predicted idea generation in both tasks, total words in DIS, and grammaticality in SEN. SPEED predicted production fluency in both tasks, and idea density and grammaticality in SEN. Inhibition predicted total words in SEN. WM predicted production fluency in DIS. Age group predicted performance in all SEN measures but one, idea density. Models accounted for 4-20% of variance.

Processing speed’s role in production fluency may relate to speed of lexicalization, minimizing filled and unfilled pauses and repeated words. EF-FLU relates to facility with generating concepts to fit specific criteria, which may explain its relationship with words and ideas. Inhibition predicted overly verbose responses in SEN, suggesting off-target verbosity. Thus, EF and processing speed play a greater role in language production than working memory.

Authors:
Lori JP Altmann, UF Department of Speech, Language, and Hearing Sciences

4: Predicting Cognitive Impairment and Dementia: A Machine Learning Approach

Poster Session: B
Presenter: Damaris Aschwanden, Florida State University
Keywords: Cognitive Impairment, Dementia, Predictors, Longitudinal
Abstract: Efforts to identify important risk and protective factors for cognitive impairment and dementia have to date mostly relied on meta-analytic strategies. A comprehensive evaluation of these risk and
protective factors within a single study is currently lacking. We used a machine learning approach to estimate the relative importance of 52 predictors for cognitive impairment and dementia in a large, population-representative sample of older adults. Participants from the Health and Retirement Study (N = 9,905; aged 50-98 years) were followed for up to 10 years (M = 6.86). Using a split-sample methodology, we first estimated the relative importance of predictors using machine learning (random forest survival analysis), and we then used parametric survival analysis (Cox proportional hazards) to estimate effect sizes for the strongest variables. The top ranked predictors of cognitive impairment were age, lower level of education, and lower income. For dementia, age, BMI slope and grip strength emerged as the most important predictors. Genetics and cardiovascular factors such as hypertension, diabetes, smoking and physical activity were less important than expected. Multiple post-hoc sensitivity analyses indicated that these results were robust. Our data-driven analyses in a single large cohort confirmed the overwhelming effect of age, the important roles of education, change in BMI, and a surprisingly large effect of economic status. Other risk and protective factors had relatively lower importance, which may contribute to the conflicting conclusions of expert panels and meta-syntheses.

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5: Telephone-Based Word List Recall and Hearing Ability

Poster Session: B

Presenter: Taylor J Atkinson, University of South Florida

Keywords: Memory, Hearing Loss, Language Perception, Assessment, Telephone-Based Cognitive Assessment

Abstract: Certain consonant sounds called fricatives (e.g., “s” and “f”) are difficult to hear over the telephone; phones exclude high-frequency sounds that affect their intelligibility. This may be problematic for older adults responding to phone-based memory tests. Many older adults have some degree of hearing loss, and older men have it more in the high-frequency range. Hearing loss, in combination with phone bandwidth restrictions, may reduce older adults’ recall of fricative words. Participants (n=3,612, mean age=64.2, 60% women) in the 1998 wave of the Health and Retirement study (HRS) completed a word list immediate recall task over the phone. List 4 recall was examined because it was evenly split (5 each) between words with and without fricative consonant sounds. Subjective ratings of hearing and health, age, depression, and education were also measured.

A Wilcoxon signed-rank test showed participants recalled fewer fricative (M=2.8) than nonfricative (M=3.0) words, Z=-8.47, p<.001. An ordinal regression for fricative word recall indicated a sex by hearing interaction; males with worse hearing were less likely to recall more fricative words, OR=.94, 95% CI [.88, 1.01], p=.076, after controlling for age, education, health, and depression. An ordinal regression for nonfricative word recall did not show a main effect for hearing or a hearing by sex interaction. For both models, age, education, and health were related to recall.

Consonant sounds may influence phone-based word recall, particularly for older men. Attention should be paid to word selection when designing phone-based cognitive tests in order to avoid memory impairment overestimation.
6: Baseline Pupil Size as a Measure of Anticipatory Mental State

**Poster Session: B**

**Presenter:** Nicolai D Ayasse, Brandeis University

**Keywords:** Hearing Loss, Language Comprehension

**Abstract:** The task-evoked pupillary response (TEPR) has long been used as a physiological index of cognitive effort. Unlike this response, that is measured during or after an experimental trial, the baseline pupil dilation (BPD) is a measure taken prior to an experimental trial. As such, it can be considered to reflect an individual’s arousal level in anticipation of an experimental trial. We report data for 68 participants, ages 18 to 89, whose hearing status ranged from normal hearing to a moderate hearing loss, tested over a series 160 trials on an auditory sentence comprehension task. Results show that BPDs progressively decline over the course of the testing session, with participants with poorer hearing acuity showing a steeper rate of decline than those with better hearing. Data show this slope difference to be due to participants with poorer hearing having larger BPDs than those with better hearing at the start of the experiment, but with their BPDs approaching that of the better hearing participants by the end of the 160 trials. A finding of increasing response accuracy over trials was seen as inconsistent with a fatigue or reduced task engagement account of the diminishing BPDs. Rather, the present results imply BPD as reflecting a heightened arousal level in poorer-hearing participants in anticipation of a task that demands accurate speech perception, a concern that dissipates over trials with task success. These data taken with others suggest that the baseline pupil size may not reflect a single construct.

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7: Dementias Platform UK (DPUK) Facilitates Data Access and Multi-Modal Research: Early Adversity and Cognitive Decline - A DPUK Cross-Cohort Multi-Modal Study

**Poster Session: B**

**Presenter:** Sarah Bauermeister, University of Oxford, Dementias Platform UK (DPUK)

**Keywords:** Cognitive Decline, Neuroscience: Structural, Longitudinal, Dementia, Data Platform

**Abstract:** Dementias Platform UK (DPUK) is a data repository for over 45 population cohorts with data for over 3M+ individuals in the DPUK Data Portal. Access to this rich resource of data is free and DPUK operates a ‘bring researchers to the data’ model whereby data are never downloaded but are accessed on a remote virtual desktop infrastructure (VDI) platform from anywhere across world. The VDI is pre-installed with a suite of statistical software tools such as SPSS, SAS, STATA, R, Python and MATLAB. Multi-modal data may be analysed within a single VDI which is available in different sizes depending on analyses type. Collaborative teams across the world can work together within a single project folder, across multiple cohorts, with a single project objective. DPUK is changing the way largescale datasets are accessed and analysed, and is accelerating research into new treatments for dementia and other neurocognitive disorders.

Here, we present our multi-modal work investigating early adversity and the effects on later-life cognition using multiple DPUK cohort datasets utilising survey, imaging and genetic modalities. All analyses were conducted on the DPUK Data Portal using UK Biobank, Whitehall II, MRC NSHD, ELSA, KAME and HRS cohorts (n=555,315). We find that self-report early childhood adversity has a deleterious effect on later
life cognition across multiple cohorts using latent class mixed modelling and machine learning. We also find that early adversity is significantly associated with cortical atrophy in selected white matter, grey matter and hippocampal regions with a significant APOE4+ interaction.

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8: Instructing Use of Effective Strategy Improves Recognition Memory in Healthy Adults
Poster Session: B
Presenter: Andrew R. Bender, Michigan State University
Keywords: Longitudinal, Memory, Strategy Use, Metacognition, Working Memory
Abstract: Age-related memory decrements have been attributed, in part, to declines in metacognitive, strategic abilities and judgments. However, the extent that instruction in effective encoding strategies may mitigate age- or health-related differences in recognition performance is unclear. In a longitudinal study of healthy adults from 18 to 79 years of age at baseline (mean baseline age = 50.79, SD = 15.75 years), we tested recognition memory performance for items and associations and assessed strategic beliefs and working memory performance. Testing was repeated every two years over 5 longitudinal occasions of measurement. Starting with the third occasion, we re-administered the task an additional time within the testing occasion. Unlike the prior administrations, we explicitly instructed participants to use an effective associative encoding strategy (sentence generation) while learning word pairs and re-assessed recognition performance. Using continuous time dynamic models, we modeled longitudinal trends in item and associative recognition, effects of strategic instruction, and the time-independent effects of age, sex, meta-memory beliefs, working memory, and metabolic health. Overall, younger age, better working memory, and stronger endorsement of effective encoding strategies were associated with better memory performance. Importantly, the strategy intervention attenuated the associative memory deficits and this effect persisted but weakened over time until the follow up ‘booster’ two years later. These results show multiple influences on memory performance across the lifespan, and the differential benefits of strategic instructions.

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9: Influence of β-Amyloid and Age on BOLD Variability during n-back
Poster Session: B
Presenter: Maria A Boylan, University of Texas at Dallas, Center for Vital Longevity
Keywords: Neuroimaging: Functional, Working Memory
Abstract: Examination of the influence of aging on brain signal variability thus far has yielded mixed results, with some evidence for higher BOLD variability in younger compared to older adults; while other instances reveal higher signal variability with older age. However, in pathological conditions, such as Alzheimer’s disease, individuals evidence elevated brain signal variability. Here, a healthy cohort of 67 participants (aged 50-95; 69.66 ± 10.65 years) underwent PET β-amyloid (Aβ) imaging, completed a digit n-back task during fMRI (0-, 2-, 3-, 4-back), and a cognitive battery. The mean of successive squared differences (MSSD), a measurement of BOLD variability, was calculated for each task condition. In a whole-
brain search, an Age*Aβ interaction was found on BOLD variability in bilateral parietal lobe, pre/postcentral gyri, and lateral cerebellum, suggesting that as age increases so does brain signal variability, and this age-variability slope is even steeper in individuals with higher Aβ burden. Further, this age- and amyloid-related increased variability was associated with poorer accuracy during the task as evidenced by a significant age*Aβ*MSSD interaction. Lastly, these results extended to predict outside-of-scanner working memory, with significant age*MSSD and Aβ*MSSD interactions on Digit Span Backward where high Aβ individuals with high variability and middle-aged individuals with high variability evidenced the poorest task performance. Results suggest that brain signal variability increases with age, especially in the presence of higher Aβ burden, and this increased variability is detrimental to task accuracy and working memory performance in cognitively normal, healthy adults.

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10: Predicting the Effects of Language Learning on Cognition and Well-being in Late-Life Depression: A systematic review and future directions

Presenter: Jelle Brouwer, Center for Language & Cognition: University of Groningen

Keywords: Depression, Cognitive Reserve, Bilingualism, Executive Function, Systematic Review

Abstract: Late-life depression (LLD) is often overshadowed by other age-related illnesses such as Alzheimer’s disease. Studies estimate, however, that approximately a quarter of community-dwelling older adults, and nearly half of those in nursing homes experience depressive symptoms to varying degrees. This is problematic, as LLD and cognitive dysfunction are closely linked, which has even led some to consider LLD a prodromal form of dementia. Unsurprisingly, social well-being is negatively impacted in those with LLD, too, with loneliness and small social networks being characteristic of LLD patients. The effectiveness of antidepressants in LLD patients is not supported by meta-analyses, and many avoid seeking mental health professionals due to stigmas surrounding LLD. A proposed solution that is inherently social, while simultaneously targeting brain structures affected in LLD, is foreign language learning. It has been suggested that lifelong bilingualism boosts cognitive reserve, which significantly delays the onset of cognitive impairment symptoms. Recent research has suggested that even late-life foreign language learning can be beneficial in training cognitive flexibility, a useful skill in staving off rumination in LLD patients. Simultaneously, the classroom-based nature of a language intervention may reduce feelings of loneliness associated with depression in older adulthood. The present review, therefore, aims to systematically compare the cognitive domains that are weakened in LLD to those that are strengthened by foreign language training. Additionally, findings regarding changes in well-being as a result of group-based interventions will be discussed. Based on this systematic review, future directions for language training in relation to LLD will be presented.

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11: A STRUCTURAL EQUATION MODEL FOR METAPHOR COMPREHENSION AND INTERPRETATION IN ADULTHOOD AND AGING

Poster Session: B
Presenter: Irene Ceccato, Department of Brain and Behavioural Sciences, University of Pavia
Keywords: Communication, Social Cognition, Language Comprehension
Abstract: Metaphor understanding is part of pragmatics abilities, a communicative competence allowing people to infer the interlocutor's intentions within the interactional context. Research in clinical populations suggests theory of mind (ToM) is an important factor for metaphor understanding, but no study has yet investigated this topic in aging.

We created the Physical and Mental Metaphor task (PMM), which requires to explain the meaning of metaphorical expressions referring to either physical (e.g., height) or mental characteristics (e.g., emotions). Two indices were computed: a Comprehension score indicating how well the metaphor is understood, and an Interpretation score reflecting the appropriate use of mental/physical characteristics, depending on the type of metaphor.

The study involved 201 healthy middle-aged and older adults (M = 70.37, SD = 7.31, age range 55-93). Participants completed the PMM task along with two ToM tasks and a verbal knowledge test. Results indicated satisfactory reliability of the PMM task. Structural equation models revealed that ToM explained metaphors’ Comprehension score (βs ≥ .41) beyond the effects of age, educational level and verbal knowledge. Crucially, ToM performances were related to the Interpretation score for Mental (βs = .29), but not for Physical metaphors.

Findings suggest that ToM ability plays a critical role in metaphors’ comprehension, possibly due to broad inferential skills required in both abilities, and a specific role in metaphors’ appropriate interpretation. Overall, ToM ability is crucial for older people’s communicative competence.

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12: Neural discriminability increases in older adults following cognitive training to reduce false memories

Poster Session: B
Presenter: Jordan D Chamberlain, The Pennsylvania State University
Keywords: False Memory, Neuroimaging: Functional, Training, Episodic Memory
Abstract: During episodic retrieval, the ability to discriminate between previously seen (targets) and unseen (lures) items is reduced in older compared to younger adults. This age-deficit is a primary contributor to age-related increases in perceptual false memories. Congruent with this deficit, our lab has shown that, while neural patterns associated with targets and lures are discriminable across the lifespan, an age deficit in this neural discriminability exists. Inspired by this, we investigated whether retrieval-based cognitive training could reduce false memories by inducing changes in neural discriminability for targets and lures within healthy older adults using fMRI and multivariate classification analysis. Behaviorally, we found that cognitive training resulted in false memory reductions in the training group, but not the control group. Furthermore, neither group exhibited increases in true memories, suggesting
training specifically benefited false memory processing in the training group. While no training-related changes in BOLD activation were observable, we found that neural discriminability for targets and lures increased in the training group above that observed in the control group within portions of the fronto-parietal retrieval network at a post-training fMRI session. We further found that increases in classification accuracy corresponded to an increase in correct rejections for lure items. Classification searchlight results suggest that additional cortical regions display training-related malleability in neural pattern discriminability. These results demonstrate that cognitive training alters the discriminability of neural patterns associated with seen and novel information, and corresponds to beneficial memory error reductions within older adults.

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13: The Effects of Captioning Errors, Background Noise, and Hearing Loss on Memory for Text-Captioned Speech in Younger and Older Adults

Poster Session: B
Presenter: Hannah A Crandell, University of Utah
Keywords: Hearing Loss, Language Comprehension, Memory
Abstract: Previous studies have suggested that the negative effects of acoustic challenge on speech memory can be attenuated with assistive text captions, particularly among older adults with hearing impairment. However, no studies have examined the effects of text captioning errors, which are common in automated speech recognition (ASR) systems. In two experiments, we examined memory for text captioned speech (with and without background noise) when captions had no errors (control) or had one of three common ASR errors: substitution, deletion, or insertion. In both Experiment 1 (young normal hearing) and Experiment 2 (older adults with varying hearing acuity), we observed similar additive effects of caption errors and background noise, such that increased background noise and the presence of captioning errors negatively impacted speech recall and recognition memory. In particular, insertion errors reliably showed the largest disruption to speech memory. Importantly, the negative effects of captioning errors were largest among older adults with increased hearing thresholds, suggesting that they show an increased reliance on text captions compared to normal hearing adults. These findings show that even a single word error in text captions can be deleterious to subsequent memory, particularly among older adults with lowered hearing acuity. Therefore, to produce the greatest benefit to memory, it is crucial that text captions are accurate.

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14: Cognitive trajectories in later adulthood: Impact of cognitive reserve and prior cognitive decline

Poster Session: B
Presenter: Graham ML Eglit, Veterans Affairs San Diego, University of California, San Diego
Keywords: Cognitive Reserve, Longitudinal, Developmental Trajectories
Abstract: Longitudinal studies of aging typically lack cognitive data from earlier ages. It is therefore unclear whether cognitive trajectories preceding longitudinal aging study induction are important for predicting subsequent cognitive performance. In the Vietnam Era Twin Study of Aging (VETSA), participants were
administered a measure of general cognitive ability (GCA) at age 20 and at all VETSA waves. We evaluated whether GCA trajectory from age 20 to VETSA wave 1 (mean age=56, SD=2) predicted subsequent cognitive performance (n=1273). Residuals from a regression equation predicting wave 1 GCA from age 20 GCA were used to index pre-VETSA cognitive change. Wave 1 GCA and GCA residuals were entered into models to predict specific cognitive abilities across three VETSA waves (age range=51-73). Better wave 1 GCA was associated with significantly better wave 1 memory, semantic fluency, general fluency, processing speed, executive function, and working memory. After matching on wave 1 GCA, lower GCA residuals, reflecting decline from higher age 20 GCA, independently predicted significantly better wave 1 memory, general fluency, executive function, and working memory. All specific cognitive abilities declined over time, but neither wave 1 GCA nor GCA residuals predicted extent of decline. Both current GCA and early adult GCA are important predictors of cognitive functioning in late midlife. In individuals with the same midlife GCA, higher earlier peak GCA still confers better functioning in several specific cognitive abilities. Despite there having been a significant decline from young adulthood, the results suggest that there is still some enduring effect of higher cognitive reserve.

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15: Associative Memory in Older Adults: Predictors of Performance Change Across Six Years

Poster Session: B
Presenter: Gwenda Engels, Tilburg University

Keywords: Associative Memory, Predictors, Longitudinal

Abstract: Episodic memory refers to the conscious remembrance of single items and item associations, of which associative memory is especially affected in aging. Yet, there are large inter-individual differences within age groups. Most studies have investigated predictors of the age-related associative memory deficit using cross-sectional age-comparative data, which impede the interpretation of within-person changes. Here, we used longitudinal data from a population-based cohort study (Swedish National study on Aging and Care in Kungsholmen, SNAC-K). We investigated predictors of inter-individual differences in associative memory changes over a six-year interval. Using an item-associative memory task, we measured associative memory independently from item memory. Twenty-three predictors originating from cognitive, health-related, and social domains were investigated. The sample consisted of 415 subjects, aged 60 years at baseline (M = 60.44, SD=.23).

Mean associative memory performance did not change across six years. Nonetheless, considerable between-person differences in performance changes were observed. Almost none of the cognitive, health, and social predictors could explain these differences. However, higher depressive symptom scores at baseline were predictive of associative memory decline six years later. Trends were found for higher semantic memory and more frequent engagement in mental leisure activities being associated with better
associative memory six years later. None of these variables were predictive of item memory change. Even though we found individual factors that marginally contributed to changes specifically in associative memory, we suggest that predictive models should include a broader range of predictors (e.g. biological measures) to be able to fully grasp the complexity of associative memory.

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16: Earliest IADL Difficulty in Well-Functioning Older Adults
Poster Session: B
Presenter: Danielle M Feger, Johns Hopkins University
Keywords: Activity Engagement, Cognitive Decline, Health and Well Being, Individual Differences, Longitudinal
Abstract: Introduction: Instrumental ADLs (IADLs) are complex tasks and incorporate both functional and cognitive demands, and some may deteriorate earlier than others. The relative ordering of which IADLs become difficult first for most older adults is understudied.

Methods: Persons from the Advanced Cognitive Training in Vital Elderly (ACTIVE) study who were free of self-reported IADL difficulty at study entry were followed for up to 10 years or until first IADL difficulty (N=1,277). A discrete-time multiple event process survival mixture was used to estimate the hazard of first incident difficulty in specific IADL domains from ages 65-80 and to align incident difficulty for specific IADL hazards in time.

Results: A total of 887 (69%) of older adults reported incident IADL difficulty during follow-up. The hazard of first incident difficulty in any of the specific IADL domains increased with age. The highest cumulative hazard by 80 years was for managing health care (0.562), followed by housework (0.376) and phone use (0.355).

Conclusion: Managing health care and phone use are more cognitively-engaging IADLs, while housework is a more physically-engaging IADL. Timely identification of new difficulty in managing health care is critical for individual well-being, reducing medication use errors and adverse events. Additionally, the specific IADL tasks that become difficult first may be indicative of impending cognitive or physical decline in an individual.

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17: Elucidating the Neural Mechanisms of Working Memory and Cognitive Reserve Among Younger and Older Adults Using Structural and Functional Neuroimaging
Poster Session: B
**Presenter:** Dylan Franklin, University of Ottawa,

**Keywords:** Cognitive Reserve, Working Memory, Alzheimer's Disease, Neuroimaging: Functional, Memory

**Abstract:** Age-related cognitive decline is a growing concern worldwide, especially with the rise in prevalence of Alzheimer’s disease. Thus, there is an increasing need to explore methods for delaying or preventing cognitive decline. The current study integrates structural and functional neuroimaging to identify the neural mechanisms underlying both cognitive decline and cognitive preservation in relation to age-related neural-pathological decline. Participants in this study complete cognitive memory, speed, fluid ability, verbal and executive function tests and complete a comprehensive lifestyle questionnaire. Using functional neuroimaging, participants perform three working memory tasks (verbal and spatial delayed-match-to-sample and n-back). These tasks utilize individually titrated task demands to investigate brain activity up to and beyond the individual’s cognitive capacity. Additional scans of white matter integrity, cerebral blood flow, grey matter anatomy and neuromelanin provide measures of age-related neural-differences. Preliminary analyses of seven people demonstrated significant activation in the left inferior frontal, right paracingulate and the left precentral gyri for the verbal memory task and within the left occipital cortex, right superior parietal and the left middle frontal gyri for the spatial memory task. The full dataset will include 40 young and 80 older adults. Moderated-mediation analyses will integrate the different brain imaging modalities, cognitive performance and individual difference measures to elucidate the neural mechanisms of current cognitive aging theories. The findings of this research will provide valuable insight into the lifestyles and their neural mechanisms that promote maintained cognition in later life, providing the groundwork for interventions that maintain cognitive ability.

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18: Age and Intranasal Oxytocin Effects on Trust-Related Decisions: Behavioral and Brain Evidence

**Poster Session:** B

**Presenter:** Ian Frazier, University of Florida

**Keywords:** Decision making, Oxytocin, Social Cognition, Neuroimaging: Functional, Superior Temporal Gyrus

**Abstract:** Age-related change in cognition and socioemotional functions, and in brain regions associated with these processes, may reduce sensitivity to cues of untrustworthiness. This change may increase trusting behavior and contribute to susceptibility to deception among older adults. The neuropeptide oxytocin has been shown to attenuate response to negative social stimuli, including in contexts related to trust, but its effects in aging are not well understood. This study investigated adult age differences on monetary investments in a Trust Game after participants received breach-of-trust feedback (i.e., information that game partners only returned investments in 50% of the trials) and determined the extent to which intranasal oxytocin modulated trust-related decision making on the level of brain and behavior. Forty-seven younger and 46 older participants self-administered 24 IUs intranasal oxytocin or a placebo in a randomized, between-subject procedure, before engaging in a Trust Game in the MRI scanner. After breach-of-trust feedback, older participants increased while younger participants decreased their investments into game partners; treatment (oxytocin vs. placebo) did not modulate this behavioral effect. However, older participants in the oxytocin group showed less left superior temporal gyrus activity after
compared to before breach-of-trust feedback, while the opposite effect held for older participants in the placebo group. These findings support the notion that reduced responsiveness to cues of untrustworthiness in aging may contribute to increased trusting behavior. Furthermore, oxytocin-associated downregulation of left superior temporal gyrus activity after breach-of-trust among older adults supports the neuropeptide’s role in neural processes underlying trust-related decision making in aging.

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19: Different Patterns of Amygdala Connectivity at Rest Predict Emotional Memory Across the Lifespan

**Poster Session:** B

**Presenter:** Sara N Gallant, University of Southern California

**Keywords:** Positivity Effect, Memory, Neuroimaging: Functional

**Abstract:** Relative to their young counterparts, older adults tend to remember more positive than negative information. This age-related positivity effect is thought to reflect a motivational shift to prioritize emotion regulation goals as time perception narrows in later life. In turn, these goals may guide older adults to focus on positive information and avoid negative information. Consistent with this notion, older adults with stronger resting connectivity between the amygdala and prefrontal cortex (PFC), a network implicated in emotion regulation, have shown to favor positive information in memory (Sakaki et al., 2013). Here, we used a population-derived sample (www.cam-can.org) to test how amygdala-PFC network engagement during resting fMRI relates to memory for neutral information encoded in emotional contexts. During the task, young (ages 18-39), middle-aged (ages 40-59), and older adults (ages 60-87) imagined a story between a series of neutral objects superimposing positive, negative, or neutral scenes. Whereas emotion had no effect on young adults’ incidental memory for objects, both middle-aged and older adults showed a benefit in memory for objects from positive contexts. We also found that different patterns of resting amygdala connectivity predicted emotional memory across age groups. Relative to young adults, increased amygdala-PFC connectivity during rest was associated with better memory for objects encoded on emotional scenes in older adults. These results support the notion that older adults’ emotion regulation goals are chronically activated at rest, modulating how information is encoded in memory.

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20: What about the neural correlates allowing to maintain episodic memory performance in aging?: a longitudinal event-related potential study

**Poster Session:** B

**Presenter:** Lina Fernanda Guerrero, UMR-CNRS 7295 : Centre de Recherches sur la Cognition et l'Apprentissage (CeRCA), Université de Tours; Université de Poitiers
Keywords: Episodic Memory, Cognitive Decline, Longitudinal, Effet Old/New, Brain Reorganisation

Abstract: Neural mechanisms allowing to maintain an efficient episodic memory (EM) functioning with aging remain poorly understood. Using a longitudinal design, we explored whether the patterns of evolution of the event-related potentials (ERP) correlates of successful retrieval (old/new effect) varied as a function of the memory change level over time. ERPs from 29 participants, aged between 42 and 73 years at baseline, were recorded while they performed a word-stem cued-recall task, twice (T1 vs T2), at a 4 years interval. Participants were divided into two groups as a function of a Memory Change Index ((ScoreT2-ScoreT1)/ScoreT1), allowing to compare evolution of ERPs for participants whose EM performance is maintained over time (Maintain Group, MG) with those experiencing an EM decline (Decline Group, DG). Results indicated that the pattern of change of the old/new effect over the time differed between groups. At T1, both groups exhibited the same pattern, with a bilateral frontal and parietal positive old/new effect (ERPs for old > ERPs for new items), greater at right sites. The old/new effect pattern observed for the DG remained stable from T1 to T2. In contrast, for the MG, the frontal and parietal positive effect observed at T1 disappeared at T2, and was replaced by a frontal negative old/new effect (ERPs for new > ERPs for old items). This brain reorganization pattern, consisting in a frontal negative old/new effect at T2, could be considered as a compensation pattern sustaining strategic processes, allowing those participants to better maintain memory abilities over time.

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21: Longitudinal Associations of Depressive Symptoms and Subjective Memory with Objective Memory: Utility of a Multi-factor Approach

Poster Session: B
Presenter: Wonjeong Haavisto, University of Nebraska at Omaha, Creative Engagement Partners
Keywords: Depression, Memory Complaint, Memory, Longitudinal, Methods

Abstract: This current study aims to examine longitudinal associations between depressive symptoms, subjective and objective memory. Previous, primarily cross-sectional, studies have demonstrated that general frequency of forgetting (GFF), a factor of subjective memory, was most strongly associated with objective memory (OM) as measured by list recall. Few studies considered multifaceted properties of the GFF factor when examining associations of subjective memory and depressive symptoms with OM. Structural models were utilized to determine how latent factors of depressive symptoms (via the CES-D) and GFF subscales (frequency of forgetting; forgetting while reading; remembering past events) predicted subsequent OM. Different associations between GFF subscales and OM resulted [RMSEA=.036; CFI=.974; TLI=.967] when taking into account baseline OM performance in the Seattle Longitudinal Study (n=270; mean Age=70.33; SD=7.29; mean Education=15.30; SD=2.72; 61.9% female). OM performance at baseline had cross-sectional associations with frequency of forgetting (r=.25, p <.001), forgetting while reading (r=.22, p<.001), and remembering past events (r=.12, p<.05). However, no GFF subscale showed longitudinal associations with OM measured seven years later, when taking into account baseline OM. The somatic complaints depressive factor showed a significant longitudinal association with OM performance after seven years (β= -.26, p<.05), while none of CES-D factors showed cross-sectional associations with baseline OM. Overall findings suggested that people endorsing more somatic depressive complaints at baseline experienced greater memory decline over a seven year period. This study extends
prior work suggesting that although GFF subscales showed concurrent associations with OM, only a specific factor of depressive symptoms, somatic complaints, predicted later OM performance.

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22: Recollection effects in the dorsal striatum, but not hippocampus, are reduced in healthy older adults

Poster Session: B
Presenter: Paul F Hill, University of Texas at Dallas, Center for Vital Longevity
Keywords: Episodic Memory, Neuroimaging: Functional, Hippocampus

Abstract: The effects of age on recollection effects in regions comprising the ‘core recollection network’ are eliminated when controlling for individual differences in memory performance, suggesting that patterns of neural activity associated with successful retrieval do not reliably differ between young and older adults. Though not typically considered as part of the core network, neural activity in the striatum has been consistently linked to retrieval success in young adults; however, the effect of age on striatal recollection effects remains poorly understood. Here, young and older adults (Ns = 24) underwent fMRI as they studied concrete nouns paired with images of faces or scenes. Old and new words were presented in a later memory test and, for words judged ‘old’, a source memory judgement for the corresponding image class was required. Recollection effects, operationalized as enhanced activity elicited by source correct vs. source incorrect trials, were evident in bilateral hippocampus, bilateral putamen, and left nucleus accumbens. Submitting parameter estimates from each cluster to 2 (age) x 2 (memory) ANOVAs revealed a significant age x memory interaction in the right putamen which was driven by weakened recollection effects in older adults. Age effects were not evident in any of the other clusters. Crucially, the effect of age on the recollection effect in the right putamen remained significant when between-subject differences in source memory performance were partialed out, suggesting that retrieval success effects in the dorsal striatum differ between young and older adults, providing potential insight into the neurobiology of age-related memory decline.

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23: Working Memory, Hearing Acuity, and Cognitive Effort in “Gist” Processing of Spoken Sentences: A Pupillometry Study

Poster Session: B
Presenter: Alana J Hodson, Brandeis University
Keywords: Working Memory, Hearing Loss, Language Comprehension

Abstract: Maintaining and updating a rapid stream of information as we listen to conversation places a heavy burden on working memory as well as on good hearing acuity. The present study aimed to identify the use of a potentially effort-conserving “gist” or “good enough” approach to spoken sentence comprehension in which plausibility is weighted heavily, especially for syntactically complex sentences. Additionally, we sought to measure the effect of this approach on cognitive effort using pupillometry. Younger and older adults were tested for comprehension of plausible and implausible sentences that varied in syntactic complexity while an eye-tracker continuously recorded their pupil size. Results showed
that as sentence complexity increased, participants were more likely to base comprehension on plausibility rather than literal syntax. However, when participants were divided into high and low working memory groups, while both groups appeared to employ a “gist” heuristic in comprehension of the most complex sentences, measurement of pupil dilation suggested that only for those with high working memory does this approach conserve cognitive effort. When working memory capacity and hearing acuity were taken into account age contributed no additional variance. These findings highlight the role of working memory in the implementation of effort-conserving strategies and further elucidates syntactic and heuristic analyses in speech comprehension.

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24: Consistency-Coherence of Cognitive performance in adults and elderly
Poster Session: B
Presenter: Laura Jamison, University of Virginia
Keywords: Methods, Intelligence, Reasoning, Depression, Cognitive Decline
Abstract: Analyzing the average performance on cognitive tasks representing different intelligence domains (e.g. memory, reasoning, vocabulary) is very common in cognitive aging studies, as well as the use of linear models. In spite of their usefulness in describing aging processes, these two analytical strategies are not adequate to investigate more complex trends in the data, including non-linear associations and the consistency of the performance. The current presentation will introduce an innovative non-linear measure from quantum information theory that estimates the coherence-consistency of a set of variables. The coherence-consistency measure will be applied in cognitive data from healthy adults and older adults (from 49 to 102 years, without depression and dementia) that participated in the 2010, 2012, 2014 and 2016 waves of the Health and Retirement Study (n = 47,822). The between-subject analysis shows that the cohesion-consistency of the cognitive measures increases with age, and the pattern is consistent for every wave analyzed. The presentation will finish with a discussion addressing how the findings impacts our knowledge of cognitive aging.

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25: Impact of Dual-Tasking on Conversational Quality in Older Adults
Poster Session: B
Presenter: Hyeon Jung Kim, University of Nebraska at Omaha
Keywords: Multi-Tasking, Language Production, Communication, Individual Differences
Abstract: Dual-task performance is considered a high cognitive load situation (HCLS), and is influenced by numerous variables. Prioritization decisions, which may vary with age, result in differential performance on the various tasks. Walking and talking is a common HCLS. The purpose of this study was to investigate how the walking while talking HCLS impacts the ability to carry on a conversation. Fifteen older adults (60% female) aged 70.8 ± 4.7 years living independently in the community participated. They engaged in a series of 10-minute conversations: on a hand held cell phone; while walking with optic flow; or while walking without optic flow. These same three conditions were present while talking in person. Walking was on a self-paced treadmill in a virtual reality laboratory while gait and conversation data were
collected. Conversations were analyzed with LIWC software yielding four variables: Analytical thinking, Clout, Authenticity, and Emotional Tone. A series of 3 (HCLS: single, DT optic flow, DT non-flow) X 2 (Task: in person, on phone) ANOVAs were employed. No significant main effects or interactions were present for Clout or Authenticity. However, a main effect of HCLS emerged for Emotional Tone (p=.021), which was higher in DT optic flow, compared to the single task condition (p=.012). For Analytical thinking, there was a significant interaction between HCLS and Task (p=.02). Although speaking patterns may have developed through life experience and became a structured behavior, discussion will include how HCLS may affect older adults’ speaking patterns and processing of information, ultimately impacting cognitive performance.

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26: Die Young As Late As Possible Project – Trajectory Analysis to Identify Super-Agers

Poster Session: B

Presenter: Brandon S. Klinedinst, Iowa State University

Keywords: Alzheimer’s Disease, Cognitive Decline, Developmental Trajectories, Longitudinal, Methods

Abstract: Populations are aging worldwide, average life expectancy has stagnated, and prevalence of Alzheimer’s disease and related dementias are increasing. Brain aging is accompanied by volumetric changes that negatively impact most cognitive processes. Despite what happens to the majority, or what happens on average, there is a vast range of variation in neurocognitive development in late life. Histological brain research has identified rare “Super-Agers” who present with fewer neurofibrillary plaques and lack significant atrophy. Yet, there is no standard for how to identify a potential Super-Ager in observational settings. Charting the distinctiveness of developmental trajectories within a population will help identify meaningful subpopulations that could not be uncovered ex ante. In this study we seek to identify sub-populations who have been aging most successfully.

Fluid intelligence data among 17,016 UK Biobank subjects was sampled three times from 2006 until 2014. Growth curves were used to estimate levels and rates of change. With these trajectory values, a cluster analysis distinguished latent groups of optimal vs. typical cognitive aging trajectories. We identified up to seven distinguishable trajectories. Each trajectory component was significant at p<.001. Two trajectories exhibited learning and other improvements over time, three others maintained cognition over time, and two more were in decline.

Among longitudinal cohorts, cluster analysis applied to growth curves can identify meaningful sub-groups without the need for expert diagnosticians. Including this information in models promises to reduce within-group variance, and testing for conditional processes that are not unanimous across a population.

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27: Adult age differences in simulating situations during discourse comprehension

Poster Session: B
Presenter: Xiaomei Liu, University of Illinois
Keywords: Language Comprehension, Embodied Cognition
Abstract: During discourse comprehension, readers build a multidimensional mental model of the situation suggested by the text. The ability to construct mental models has been shown to be preserved with aging, but this has been primarily demonstrated with spatiotemporal dimensions of the situation. Age-related effects on the simulation of actions and emotional states of narrative protagonists have been less explored. To examine this, we measured processing time as younger and older adults matched in education level (n=19 Y and 20 O in Expt 1; n=32 Y and 32 O in Expt 2) read short narratives that included a quotation uttered by a protagonist who was described as speaking quickly or slowly. This speech rate manipulation was crossed with an emotional augmentation condition (neutral vs. happy-fast or sad-slow). Processing time for the quotation was measured as total reading time using self-paced reading in Expt 1; and as total fixation time using eye-tracking in Expt 2. Older, but not younger, adults spent more time reading direct quotations spoken slowly compared to those as spoken quickly, suggesting an age-related advantage in simulating situations while comprehending narratives. In Expt 1, the speech rate effect among older adults was only significant in the emotional augmentation condition. However, in Expt 2, this age by speech rate interaction was significant regardless of the emotional augmentation condition. Collectively, these findings indicate that older readers may be more likely than younger readers to spontaneously simulate narrative events in discourse comprehension.

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28: Global vs. Tract-Specific Changes in DTI Measures in Aging
Poster Session: B
Presenter: Stephanie Matijevic, University of Arizona
Keywords: Diffusion Tensor Imaging
Abstract: In aging, cerebral white matter becomes vulnerable to various pathological processes. While age-associated white matter damage is widespread, some tracts appear more robust to aging than others. The present study utilized longitudinal data to characterize tract-specific patterns of changes to DTI measures in aging, additionally covarying for APOE ε4 status and sex. Two time-points of data were collected 2.8 years apart for 49 older adults (ages 54-91). Fractional anisotropy (FA) and mean diffusivity (MD) values were extracted from segmented white matter plus nine regions-of-interests from the Mori et al. (2008) white matter atlas. ANOVAs on global FA and MD revealed that both measures increased with time, though age at T1 was associated with decreases in FA and increases in MD. Males had greater FA than females overall. Repeated measures MANOVAs with all tracts included as dependent variables produced results similar to those of the global models, expect for a significant effect of sex on MD. When global FA and MD were controlled for in the MANOVAs, only effects of age on FA and sex on MD survived. Post-hoc tests revealed that FA declined with age in all but the splenium, superior longitudinal fasciculus (SLF) and uncinate fasciculus, and that MD in the anterior cingulum and SLF was higher in females. The relationship between age and FA thus appears to vary across tracts, whereas MD values may change more uniformly across the brain with age. Sex differences, in contrast, seemingly influence FA globally and MD in a tract-specific manner.

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29: BOLD variability is associated with age and attentional control

Poster Session: B

Presenter: Peter R Millar, Washington University in St. Louis

Keywords: Neuroimaging: Functional, Attention

Abstract: Measures of variability in blood oxygen-level dependent (BOLD) signal from functional MRI are emerging as individual difference measures in cognitive aging research. Many studies have found that BOLD variability is negatively related with age and positively related with task performance, perhaps suggesting that BOLD variability may reflect an age-dependent, functionally-relevant signal. However, further work is needed to replicate these effects and characterize potential contaminating variables, such as head motion. We pursued these aims in a large (N = 422) sample of resting-state fMRI scans from cognitively normal individuals ranging in age from 40 to 80 years old. Participants also completed a battery of cognitive tasks including multiple measures of attentional control and episodic memory. After strictly controlling for the influence of head motion, using global signal regression and framewise motion censoring, we replicated the negative relationship between BOLD variability and age. Additionally, we observed positive relationships between BOLD variability and measures of attentional control, including a composite measure of performance on Stroop, Simon, and task-switching tasks. BOLD variability relationships with both aging and attentional control measures were broadly distributed throughout a wide range of functional networks. Our results support the general findings that age is associated with reduced BOLD variability and that BOLD variability is positively associated with cognitive performance, particularly in attentional control tasks. Current work focuses on isolating the mechanism underlying these relationships. The broad pattern of these relationships across functional networks suggests that a global mechanism might best account for these effects.

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30: Blast from the past...Stroop Interference & Aging

Poster Session: B

Presenter: Jessica Nicosia, Washington University in St. Louis

Keywords: Attention, Speed of Processing, Meta-Analysis, Stroop

Abstract: The Stroop task is regarded as the “gold standard” for assessing attention and is used in a variety of cognitive and psychometric batteries to examine cognitive control differences across age and patient groups. However, processing speed differences between age groups is a notorious challenge, complicating age interactions in reaction time data. Several meta-analyses using Brinley analyses to control for general slowing have indicated that there is no evidence of an age deficit in Stroop interference above and beyond general slowing. In the present study, we investigated the Stroop effect in younger and older adults using data from 23 experiments from different labs, and Universities. Critically, all datasets came from computerized, color-naming Stroop tasks with available trial-level data for congruent and incongruent trials. We examined age differences in the Stroop effect by controlling for general slowing in several ways. First, following Faust, Balota, Spieler & Ferraro (1999), trial-level response latencies for each participant were z-scored based on each individual’s mean response latency and standard deviation for correct trials. Second, we calculated a proportion score dividing each participant's Stroop effect (incongruent response
time minus congruent response time) by their mean incongruent response time. Third, we performed a
linear mixed-effect model allowing the intercept to vary randomly for each participant. All three
approaches yielded a consistent pattern suggesting disproportionate age differences in the Stroop effect
after controlling for general slowing. Discussion focuses on the utility of accounting for age-related
slowing at the individual level, as opposed to group or individual means across conditions.

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31: Genetic Determinants of Episodic Memory Change: New Evidence for Heritability and
a Role for Alzheimer’s Disease Risk

Poster Session: B
Presenter: Matthew S Panizzon, Department of Psychiatry, University of California San Diego
Keywords: Episodic Memory, Cognitive Decline, Alzheimers Disease, Genetics, Longitudinal
Abstract: The heritability of episodic memory performance is well established. Less clear, however, is the
degree to which age-related changes in episodic memory are driven by genetic factors. In the present
study we sought to estimate the heritability of episodic memory change, and determine the relative
contribution of Alzheimer’s disease (AD) polygenic risk to that change. Data were obtained from the
Vietnam Era Twin Study of Aging. Average ages at assessment were 55.7 (±2.7, N=1285), 61.7 (±2.4,
N=1202), and 67.5 (±2.5, N=1169). The average interval between the first and third assessments was 11.6
years (±0.79). Episodic memory was assessed with the California Verbal Learning Test-II, the Logical
Memory, and Visual Reproduction subtests from the Wechsler Memory Scale-III, as well as a composite
score based on all three tests. Age-based, genetically-informative latent growth curve models were fit to
the data. Performance on the composite measure declined at a rate of -0.05 SD per year. This translated
into a 0.58 SD decline over the roughly 11 year assessment window. The variance of change was markedly
smaller relative to intercept (0.0007 vs 0.7697). Nevertheless, change was found to be significantly
heritable (h2=.70), and independent of the genetic influences for intercept (h2=.70). A significant non-
linear effect of AD polygenic risk on episodic memory change was observed, indicating that memory
decline was greatest at the highest level of polygenic risk. Results demonstrate that subtle changes in
episodic memory during late-middle age are heritable, and influenced by genetic risk for AD.

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32: The effects of age and hearing acuity on ERPs correlates of auditory discourse
processing in bilinguals

Poster Session: B
Presenter: Natalie A Phillips, Department of Psychology, Concordia University
Keywords: Bilingualism, Language Comprehension, Hearing Loss, Neuroimaging: Functional, Working
Memory
Abstract: Our study examines auditory discourse comprehension in highly proficient English/French
bilinguals. We tested whether bilinguals rely more on top-down, discourse-level cues in L2 because these
are common across languages, as opposed to the language-specific associations of an often weaker L2.
We examined whether younger (YA) and older adults (OAs) weight these bottom-up versus top-down cues differently and whether this differs within OAs as a function of age-related hearing loss. We tested young (18-35 yrs; n=32) and older (60+ yrs; currently n=37) bilinguals matched on education. The OAs were separated into those with normal hearing (NH) (n=21) or mild-to-moderate hearing loss (HL) (n=16). Our ERP paradigm used three-sentence spoken stories with a target word in the final sentence. The target word varied with respect to its lexical association with a preceding word and with its congruence with the preceding discourse. For YAs, the N400 effect was sensitive to discourse congruence, an effect that was larger and more widespread regardless of lexical association in the L2. For the OA NH group, the N400 effect was sensitive to discourse congruence in both L1 and L2. However, in L2, when the target word was both discourse incongruent and lexically unassociated, there is an observed positivity over the left anterior regions. Planned analyses will determine whether this effect is exaggerated in the OA HL group, due to increased listening effort. Overall, this work provides evidence for discourse-level processing differences as a function of age and language status and will account for important age-related conditions.

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33: The effects of cardiovascular risks on working memory updating in healthy older adults: an fMRI study

Poster Session: B
Presenter: Shuo Qin, University of Texas at Dallas
Keywords: Neuroimaging: Functional, Exercise and Fitness, Working Memory, Lifestyle Correlates,
Abstract: In the current fMRI study, we examined the separate and the combined effects of two cardiovascular risk factors, arterial plasticity and physical fitness, on brain activation patterns during continuous working memory updating in healthy older adults.

A hybrid design random 2-match paradigm (Qin & Basak, under review) was used, allowing examination of brain activation associated with task blocks as well as continuous memory updating (event-related analysis). Sixty older adults (Mage=70) were recruited for this study, and their data were compared to data from 28 younger adults (Mage=21). Arterial plasticity was measured by pulse pressure (systolic – diastolic blood pressure). Physical fitness was measured by metabolic equivalent (MET) of VO2Max. Older adults with low arterial plasticity showed increased activation in right Pre-central gyrus, than those with high plasticity during task blocks. Older adults with low MET showed increased activation in right Post-central gyrus than those with high MET during update trials. Furthermore, increased activation in both right Pre- and Post-central gyri were associated with worse task performance in older adults. Older adults with 2 risk factors showed increased activation in right Post-central gyrus compared to older adults with lesser number of risk factors (0 and 1).

Across all analyses, older adults with low cardiovascular risk (high plasticity, high fitness, and with 0 risk factor) showed similar activation patterns compared to younger adults. Such results suggested that high cardiovascular risk was associated with maladaptive overactivation and exaggerated age-related differences in activation in older adults.
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34: What’s that word again? The contribution of the hippocampus to word-finding declines in aging

**Poster Session:** B

**Presenter:** Jana Reifegerste, Brain and Language Laboratory, Department of Neuroscience, Georgetown University Washington DC, USA, Potsdam Research Institute for Multilingualism, University of Potsdam, Germany

**Keywords:** Language Production, Lexical Retrieval, Memory, Hippocampus, Cognitive Decline

**Abstract:** Older adults commonly experience word-finding difficulties. Deficits of executive function, processing speed, and perceptual abilities have all been posited as explanatory accounts for these difficulties. However, it remains uncertain whether these accounts best explain the pattern of lexical declines, or are sufficient to explain them. We propose that word-finding declines in aging are largely explained by concomitant declines in declarative memory, in particular hippocampal-related declines: the declarative aging deficit (DAD) hypothesis. DAD predicts declines in lexical abilities that depend heavily on the hippocampus. Thus, particular declines should be found for words with later ages-of-acquisition, such as newer words in the language (e.g., sudoku), which may not have undergone systems consolidation as much as established words (e.g. ‘pretzel’). Moreover, lexical production (reliant on hippocampal-based recollection) should be more affected than comprehension (which can also rely on perirhinal-based familiarity). To test DAD we gave (thus far) 42 participants (ages 19-81) picture-naming (production) and picture-word matching (comprehension) tasks of both newer/recently-acquired and established/early-acquired words. Preliminary analyses revealed significant age-related lexical production declines for newer but not established words, whereas comprehension showed no declines at all. Moreover, left hippocampal (but not perirhinal) volumes predicted accuracy at producing recent but not established words. The analyses controlled for measures of word frequency, word length, SES, education, amount of general lexical input, processing speed, inhibitory control abilities, and intracranial volumes (for the volumetric analyses), while also accounting for words unknown to each participant and screening for hearing/vision and MCI. Basic research and translational implications are discussed.

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35: Functional MRI comparison of virtual path integration in younger and older adults

**Poster Session:** B

**Presenter:** Ursula Saelzler, Georgia Institute of Technology

**Keywords:** Spatial Ability, Neuroimaging: Functional, Spatial Memory

**Abstract:** The ability to navigate through one’s environment is important for older adults maintaining independence. Age-related declines in spatial navigation abilities are prevalent and there is a limited understanding of the neural mechanisms contributing to these declines. The present study used fMRI to investigate age-related differences in neural processing during a virtual path integration task. Path integration is the ability to move through an environment while maintaining an awareness of a given point, typically the starting point. This study used a virtual triangle completion task to measure path integration ability. In this task, participants were first shown a video from a first-person perspective of “walking” the first two legs of a triangle in an open virtual environment. Once the video was complete, participants were instructed to navigate themselves back to the origin point using a joystick. The virtual
environment was free of landmarks rendering self-motion as the only available cue to navigation. Imaging consisted of ten 1-minute blocks, each consisting of 2-3 triangle completions. Half of the blocks were task blocks and included the unguided return to origin while the other half were control blocks guided the participant back to the origin. Nineteen younger and 13 older adults completed the imaging task. Older adults were worse than younger adults at navigating back to the origin. Additionally, compared to younger adults, older adults had greater activation in the bilateral lingual gyrus and right inferior parietal lobe but reduced activation in the left superior frontal gyrus during the task blocks compared to control blocks. These results suggest that older and younger adults may integrate visual information differently when using path integration to navigate visually sterile environments.

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36: Going Up and Going Down: How Do Older Adults Manage Dual-Tasking on Stairs? An fNIRS study

**Poster Session:** B

**Presenter:** Talia Salzman, University of Ottawa

**Keywords:** Neuroimaging: Functional, Multi-Tasking, Executive Function, Motor Skills, Cognitive Decline

**Abstract:** Stairs are part of our environment (i.e., homes, public buildings) and are an excellent way to maintain health. Unfortunately for older adults (OAs), serious falls frequently occur on stairs. Walking research suggests that the prefrontal cortex (PFC) plays an important role in walking and walking while talking (dual-tasking) but the PFC contributions to stairclimbing (with or without a cognitive task) remain unknown. Using portable functional near infra-red spectroscopy (fNIRS) and wireless insoles, the purpose of this study was to evaluate cerebral oxygenation changes (ΔHbO2) in the PFC while monitoring gait parameters (gait speed) and cognitive performance (reaction time/accuracy) during stair ascent and descent. Seventeen healthy older adults (73.4 ± 7.3) ascended (SMup) and descended (SMdown) stairs (ST = single task). They also completed a simple reaction time (SRT) task while standing or during ascent (DTup) and descent (DTdown). Participants had slower vocal reaction times in DTup (M = 446.18 ms; p < .001) and DTdown (M = 455.53 ms; p <.001) in comparison to standing (M = 409.35 ms) but there were no significant differences in accuracy or walk speed. ΔHbO2 was significantly different (p = .003) between SMdown (MΔHbO2 = -.20) and DTdown (MΔHbO2 = .06) but not different between other conditions. Findings suggest that despite the simplicity of the cognitive task, dual-tasking on stairs resulted in increased cerebral oxygenation and slowed cognitive responses. Since stairclimbing is a common occurrence in our everyday lives, even healthy OAs must be aware that stair descent, in particular, involves higher cognitive processes.

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Accounting for Practice Effects Improves Diagnostic Precision and Biomarker Associations in MCI

**Poster Session:** B

**Presenter:** Mark Sanderson-Cimino, SDSU/UCSD Joint Doctoral Program in Clinical Psychology

**Keywords:** Practice Effects, Alzheimer's Disease, Longitudinal

**Abstract:** Practice effects (PEs) inflate cognitive scores, thereby obscuring true decline and potentially delaying diagnosis of mild cognitive impairment (MCI). Delayed diagnosis would increase false negatives, potentially reducing biomarker-diagnosis concordance. We hypothesized that replacement-subject-based PE calculations, which can detect PEs otherwise obscured by age-related decline, would improve detection of progression from cognitively normal (CN) to MCI and concordance between biomarker positivity and diagnosis. 722 CN participants (mean age=74.9; SD=6.8) from the Alzheimer's Disease Neuroimaging Initiative (ADNI) were included at baseline. MCI at follow-up was diagnosed according to both Jak/Bondi neuropsychological and Petersen criteria. We identified “pseudo-replacement” subjects who at baseline were matched to the age of returning subjects at 1-year follow-up. Groups were also matched on education and estimated premorbid IQ. Thus, at 1-year follow-up, groups were demographically matched, but one was tested for the first time and the other had prior testing. PEs were calculated by comparing returnee performance to that of pseudo-replacements. CSF Aβ42, phosphorylated tau, and total tau were measured 6-12 months prior to retesting. We subtracted PEs from follow-up cognitive scores and recalculated diagnoses. Accounting for PEs at follow-up increased Jak/Bondi MCI cases by 24.8% (p<.000001); increased the proportion of Aβ42-positive (18.8%) and p-tau-positive (29.8%) MCI cases; and decreased the proportion of Aβ42-positive (5.8%) and p-tau-positive (7.9%) CN cases. Accounting for PEs also resulted in increases for Petersen MCI cases. Biomarker evidence provides validation that accounting for PEs leads to earlier detection of MCI, which, in turn, sets the stage for earlier opportunities to slow disease progression.

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Text Captioning Reduces the Effects of Listening Effort on Speech Memory in Younger Adults and Older Adults with Hearing Impairment

**Poster Session:** B

**Presenter:** Jack Silcox, University of Utah

**Keywords:** Hearing Loss, Language Comprehension, Memory

**Abstract:** Previous research has shown that even when speech is intelligible, increases in listening effort (either due to degradation of the audio signal or due to hearing impairment) can negatively impact memory encoding processes for what is heard. It has also been demonstrated that text captioned speech can improve word recognition and perceived intelligibility of speech in adults with hearing impairments. The purpose of the present study was to determine if text captions improve recall and recognition memory for sentences in acoustically challenging listening scenarios and whether this effect is
differentially beneficial for older adults with hearing impairments. Participants (young adults, $N = 48$; older adults $N = 31$) listened to 90 propositionally dense 18-word sentences in two blocks and were tasked with immediately recalling the sentences. Half of the sentences were accompanied by text captions (presented in a cumulative fashion in 3-word chunks) and half were not. Sentences were presented with one of three levels of background noise (no noise, +7 dB SNR, +3 dB SNR). After each 45-sentence block, participants were given a recognition memory test that also contained semantically related foil items. Findings from both samples converged in showing that hearing sentences in background noise decreased performance on both measures of memory and that the presence of text captions eliminated this effect. Most critically, in older adults we found evidence for interactions between hearing loss, acoustic challenge, and text captioning, such that the negative effects of increased noise and hearing loss on speech recall and recognition were largely attenuated with text captioned speech.

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39: System Segregation is related to Cognition in the Healthy Oldest Old: Findings from the McKnight Brain Aging Registry

Poster Session: B
Presenter: Sara A Sims, UAB
Keywords: Neuroimaging: Functional

Abstract: Measuring relationships among brain regions using functional connectivity metrics has been a useful biomarker of disease and relates to individual differences in cognitive function. System segregation is a way to describe functional network dynamics that indicates how well-balanced connections are within a network and between networks. The majority of work in this area has been in younger adults and older populations with mean age under 85. Little work has described system segregation in the oldest-old. Brain networks are an important avenue for cognitive aging research since network structure, including network integration and segregation, may have a large impact on cognition.

Data were acquired as part of the McKnight Brain Aging Registry, across the four McKnight Brain Research Foundation sites. For this analysis, 106 community-dwelling, cognitively unimpaired older adults, ages 85-99 were included who had undergone structural and BOLD resting state MRI scans. Cortical surfaces were rendered for each participant and BOLD scans were pre-processed using Ciftify algorithms. Brain networks were defined based on previously identified seed regions. System segregation was measured as the difference between within-network and between-network mean connectivity, divided by within-network connectivity.

We found that the level of system segregation with the association networks was positively correlated with cognitive scores on the MoCA, suggesting a contribution of cortical network integrity to performance on this test of overall cognition. This work shows feasibility for examining connectivity patterns in the healthy oldest old and helps to advance our understanding of network dynamics in relation to cognitive performance in healthy aging.

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40: Age-related neural dedifferentiation in scene-selective cortical regions varies according to perceptual sub-category.

**Poster Session:** B  
**Presenter:** Sabina Srokova, University of Texas at Dallas, Center for Vital Longevity  
**Keywords:** Memory, Neural Differentiation, Episodic Memory, Neuroscience: Functional  
**Abstract:** Cognitive aging is associated with neural dedifferentiation - reduced neural selectivity for different perceptual categories. Age differences in neural selectivity have been extensively studied as a potential factor driving cognitive decline. Recent research suggests however that age-related neural dedifferentiation is not ubiquitous for all perceptual categories. In the present study, younger and older adults underwent fMRI as they studied words paired with images of male or female faces, and urban or rural scenes, prior to a subsequent memory test. We operationalized neural differentiation through the employment of multivoxel pattern similarity analysis (PSA) to derive category-level similarity indices for two scene-selective (Parahippocampal Place Area (PPA), Retrosplenial Cortex (RSC)) and two face-selective (Fusiform Face Area (FFA), Occipital Face Area (OFA)) regions-of-interest (ROI). In PPA and RSC, we identified reduced neural selectivity for scenes relative to faces in older adults, replicating several prior studies. By contrast, we were unable to identify analogous age effects for faces in either FFA or OFA. Of importance, further analysis revealed that age-related dedifferentiation in scene-selective regions was moderated by scene subcategory, with higher levels of selectivity, and larger age effects, for urban rather than rural scenes. These findings converge with other recent results to suggest that age-related neural dedifferentiation effects are sensitive to the nature of the category exemplars employed as experimental items. The present findings also suggest that an understanding of the effects of age on neural selectivity might benefit from the analysis of selectivity at the sub-categorical level.

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41: The bidirectional relation of cognition and depression in a large-scale-multiple measures longitudinal study

**Poster Session:** B  
**Presenter:** Mariana Teles Santos Golino, University of Virginia  
**Keywords:** Methods, Intelligence, Reasoning, Depression, Cognitive Decline  
**Abstract:** Depressive symptoms and cognitive decline are pointed in the scientific literature as coexistent phenomena in older adulthood. In general, cross-sectional and longitudinal studies have demonstrated that higher scores in self-rating depressive symptoms are associated with lower scores in multiple cognitive measures. Although the evidences are convergent to establish this negative association, the directionality of this connection remains inconsistent. The current study aimed to investigate the bidirectionality association between depressive symptoms and cognitive performance using data from 4,802 participants (18 to 99 years old) of the Virginia Cognitive Aging Project, assessed using measures from five cognitive domains (vocabulary, reasoning, space, memory and speed) and one depressive scale
(Center for Epidemiologic Studies Depression Scale). The bidirectional relationship between depressive symptoms and cognitive functioning was addressed using a longitudinal structural equation modeling framework (latent growth curve modeling). The results showed a significant negative relationship between the initial values of the cognitive ability and depression (intercepts), meaning that for individuals with a higher score of cognitive abilities, their depression levels are found to be lower. There was no significant relationship between the slopes of cognitive ability and depression, suggesting that the trajectory of the cognitive ability is not statistically related to the trajectory of the depression. Directions to expand the current knowledge about the connection between depression and cognition in longitudinal aging research will be discussed.

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42: Supply and demand: Effects of age, task demand, and ROI size on brain blood flow and metabolism

Poster Session: B
Presenter: Monroe P Turner, University of Texas at Dallas
Keywords: Neuroimaging: Functional, Methods, Neurovascular Coupling, Brain Blood Flow, Oxygen Metabolism
Abstract: Blood-oxygen-level-dependent signal (BOLD) as measured with functional magnetic resonance imaging (fMRI) underpins neurocognitive aging theories. However, the nature of changes in the parameters that underpin BOLD with task demand remain understudied. We sought to address this through the use of calibrated fMRI to disentangle two physiologic factors underlying BOLD: the rate of oxygen delivery as measured by cerebral blood flow (CBF) to metabolically active neural tissue as measured by cerebral metabolic rate of oxygen (CMRO2), and CBF/CMRO2, known as the neural-vascular coupling (NVC) ratio. Thirty healthy younger and twenty-two healthy older right-handed adults screened for any potential cardiological, respiratory, pulmonary, or vascular conditions performed a block-designed visual task while undergoing calibrated fMRI scanning. During the visual task, participants responded via bilateral button-press whenever a fixation cross at center-screen changed in luminance. During stimulation blocks, flickering checkerboards were presented at 2, 4, and 8 Hz. To calibrate BOLD, participants completed a hypercapnia challenge in which they periodically breathed both room air and a 5% CO2 gas mixture while being scanned at rest. Main effects of Age-group were observed in CBF (younger greater than older), and in CMRO2 (older greater than younger), and the NVC ratio showed a significant Age×Frequency interaction effect. Stronger NVC was associated with better performance. Our results support the hypothesis that neural-vascular coupling is affected in aging, and provides a plausible physiologic mechanism for age-related changes in performance.

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43: The Effect of Age on Longitudinal Measures of Resting State Functional Connectivity
Poster Session: B
Presenter: Eleanna Varangis, Columbia University
Keywords: Neuroimaging: Functional, Memory
Abstract: Several cross-sectional studies have shown that participant age has a significant effect on whole-brain functional connectivity at rest, however little is known about how the healthy aging process affects change in functional connectivity over time. The present study examines multiple aspects of resting state functional connectivity in healthy adults age 20-80 at two time-points in order to determine which aspects of functional connectivity change over a five-year period, whether participant age affects the magnitude of these changes, and whether these measures of functional connectivity are able to predict change in cognitive performance over five years. Results suggest that some aspects of resting state connectivity do change over the course of five years, and that these changes are mostly consistent with previously observed cross-sectional weakening effects of age on whole-brain functional connectivity. Further, change in some network-based metrics of functional connectivity is related to change in cognitive performance over the course of this five year period. While age did not consistently affect the rate of change in functional connectivity metrics over time, it partially mediated the relationship between change in functional connectivity and change in cognitive performance over five years, such that older adults show a stronger relationship between these two factors than middle-aged and younger adults. These longitudinal results generally support results from cross-sectional studies assessing the effect of age on functional connectivity metrics, and also suggest that some change in cognitive function over time may be accounted for by change in functional network organization.
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44: BOLD Hemodynamic Response Function Changes Significantly with Healthy Aging
Poster Session: B
Presenter: Kathryn L West, University of Texas at Dallas,
Keywords: Neuroimaging: Functional, Methods
Abstract: Functional magnetic resonance imaging (fMRI) has been used to infer age-differences in neural activity from the hemodynamic response function (HRF) that characterizes the blood-oxygen-level-dependent (BOLD) signal. BOLD literature in healthy aging lacks consensus in age-related HRF changes, the nature of those changes, and their implications for measurement of age differences in brain function. Between-study discrepancies could be due to small sample sizes, analysis techniques, and/or physiologic mechanisms. We hypothesize that, with large sample sizes and minimal analysis assumptions, age-related changes in HRF parameters could reflect alterations in one or more components of the neural-vascular coupling system.

We analyzed the large population-derived dataset from the Cambridge Center for Aging and Neuroscience (CamCAN). During scanning, 74 younger (18-30 years) and 173 older participants (54-74 years) viewed two checkerboards to the left and right of a central fixation point, simultaneously heard a binaural tone, and responded via right index finger button-press. HRFs were estimated using FMRIB’s Linear Optimal Basis Sets (FLOBS) to minimize a priori shape assumptions.
Group mean HRFs were different between younger and older groups in auditory, visual, and motor cortices. Specifically, we observed increased time-to-peak and decreased peak amplitude in older compared to younger adults. Changes in the shape and timing of the HRF in healthy aging, in the absence of performance differences, support our hypothesis of age-related changes in the neural-vascular coupling system beyond neural activity alone. More precise interpretations of HRF age-differences can be formulated once these physiologic factors are disentangled and measured separately.

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45: Age Differences with the Tip of the Tongue Phenomenon: A Test of The Error Learning Hypothesis
Poster Session: B
Presenter: Patricia M Xi, Denison University
Keywords: Language Production, Learning
Abstract: A tip of the tongue (TOT) state occurs when one is unable to produce a desired word despite the feeling of imminent recall (Brown & McNeill, 1966). Although the transmission deficit hypothesis (TDH; Burke, MacKay, Worthley, & Wade, 1991), the dominant model currently used to explain the underlying cause of TOTs, can be extended to explain other related TOT phenomena, the error learning hypothesis was recently proposed as an explanation for persistent or recurring TOTs (D’Angelo & Humphreys, 2015; Warriner & Humphreys, 2008). The purpose of this study was to assess the error learning hypothesis and TDH by comparing their predictions for the effects of retrieval interval time on recurring TOTs in young and older adults. Fifty-one young and 48 older adults were retested on 100 TOT-inducing stimuli with a 48-hour delay. In the initial testing session, participants were randomly assigned to either an immediate answer or 30 second forced retrieval group. A univariate ANOVA revealed that, contrary to the error learning hypothesis, those who experienced the 30-second delay resolved more of their initial TOTs on Day 2 than those who did not. While these results suggest that the error learning effect is not reliable, they are consistent with TDH. Additionally, age differences in the number of TOTs induced in the groups provided further support for TDH. However, there were no significant age differences in recurrence rates. Finally, there were more persistent alternates produced in the Delay than Immediate condition, suggesting that persistent alternates are generated during the forced retrieval interval. In sum, it appears that the error learning effect is not reliable and that the error learning hypothesis has little support. Future studies on recurring TOTs should use the theoretical model provided by TDH.

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46: Play hard, think hard: Within-Person Engagement in Daily Activities Predicts Cognitive Motivation in Cognitively Impaired Older Adults
Poster Session: B
Presenter: Xianghe Zhu, North Carolina State University
Keywords: Cognitive Impairment, Activity Engagement, Longitudinal, Cognitive Motivation

Abstract: Engagement in cognitively demanding activities tends to be positively associated with functioning in cognitively intact populations. However, the extent to which changes in activities correspond to changes in cognitive motivation in cognitively impaired populations is unclear. We examined dynamic, within-person associations between engagement in activities that place demands on cognitive resources and need for cognition. In an ongoing study of cognitively impaired older adults, 24 participants completed a total of 100 weekly reports of engagement in activities and need for cognition for five consecutive weeks. Multilevel models revealed significant within- and between-person variance in need for cognition. In addition, a multilevel model using TV watching, social activity, physical activity, developmental activity, technology activity, gaming, and experiential activity on a weekly basis as within-person predictors of need for cognition revealed that increases in gaming were associated with increases in need for cognition. These results suggest that cognitive motivation does fluctuate within cognitively impaired older adults. Although the effects of gaming on cognitive performance are mixed within cognitively intact older adults in previous work, our findings suggest that naturally-occurring increases in gaming (i.e., knowledge games such as Trivial Pursuit, strategy games such as checkers or chess, computer games, word games such as Scrabble) within an impaired sample are associated with increases in cognitive motivation. For those facing cognitive decline, motivation to engage in cognitively challenging tasks is a key ingredient to slow the progression. Our findings suggest that motivation to engage resources in cognitively demanding activities is a benefit associated with gaming.

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47: Beta-amyloid, modifiable lifestyle and health factors predict cognitive efficiency in late midlife independent of ApoE4 status

Poster Session: B
Presenter: Fabienne Collette, Associate professor, University of Liege,
Keywords: Alzheimer’s Disease, Cognitive Decline, Neuroscience: Functional, Neuroscience: Structural, Dementia

Abstract: Physiological and psychological environmental factors were proposed to explain variability in cognitive changes associated with normal aging. In the continuity of recent results showing an influence of cognitive reserve and allostatic load on cognition in late midlife (Narbutas et al., 2019), we assessed whether genetic (ApoE4 allele status) and brain Alzheimer’s Disease related biomarker (beta-amyloid deposit, Aβ) parameters modify the effect of these factors on cognition.

Seventy-five healthy late middle-aged participants were included. Cognitive efficiency was assessed by a global composite score known to be sensitive to early subtle cognitive change (PACC5); composites scores were also created for the domains of memory, attention and executive functions. Aβ brain deposit was assessed using [18F]Flutemetamol or [18F]Florbetapir PET radiotracer. Cognitive reserve was determined through lifestyle questionnaires and reading abilities; allostatic load as stress related cumulative load on several physiological systems; ApoE4 status was specified as e4 carriers (N=19, homozygous and heterozygous) and non-carriers (N=56).
General linear mixed models (GLMM) demonstrated significant positive associations between cognitive reserve and PACC5, episodic memory and executive functioning, but not with attention, whereas allostatic load was associated with PACC5 only. Then, GLMM revealed that cortical Aβ brain deposits are significantly and negatively associated with PACC5 only, while no significant association was detected between ApoE4 status and any of the cognitive measures. In conclusion, simultaneous multimodal approach has revealed that both Aβ and modifiable factors (cognitive reserve, allostatic load) could explain variability in cognitive change during normal aging, with cognitive reserve having larger effect size.

Authors:
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48: Ambulatory assessment of stressor-related depressive affect and response time inconsistency in individuals with and without MCI

Poster Session: B
Presenter: Eric Cerino, Pennsylvania State University, Center for Healthy Aging
Keywords: Assessment, Methods, Measurement, Response-Time Modeling, Mild Cognitive Impairment
Abstract: Changes in depressive affect related to reported stressors vary day-to-day, and these variations are associated with response time inconsistency (RTI), a performance-based indicator of processing efficiency. Past work primarily measures daily stress and cognition with end-of-day or in-lab assessments, approaches which potentially miss critical context captured by more-real time ambulatory methods. We address this gap using ecological momentary assessments (EMA) to examine the impact of depressive affect, both related to and apart from stressors, on RTI in adults with and without mild cognitive impairment (MCI). A sample of 243 adults from the Einstein Aging Study (Mage=77.30 years, SD=5.14; 68 with MCI) were prompted to report whether a stressor occurred since the last survey, current levels of depressive affect, and performed a processing speed task up to four times daily for 14 days. Adjusting for sociodemographics and health, we tested whether within- and between-person depressive affect-RTI associations were moderated by MCI status and age. Between-persons, larger increases in depressive affect related to reported stressors was associated with greater RTI only among individuals with MCI (Est.=0.14, SE=0.07, p=.04). Within-persons, on days when depressive affect was higher than usual, RTI was greater, and this effect was amplified in relatively older participants (Est.=0.01, SE=0.004, p=.02). Results suggest day-to-day fluctuations in depressive affect are associated with more inefficient cognitive processing, especially in older individuals and those with MCI. Leveraging intensive assessments of naturalistic stress, affect, and cognitive performance can help identify dynamic effects on cognition that may distinguish individuals with limited capacity or cognitive resources.

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Poster Session C

1: Age-Related Declines in Proactive Control

Poster Session: C
Presenter: Hunter Ball, University of Texas at Arlington
Keywords: Cognitive Control, Attention, Prospective Memory
Abstract: The dual mechanisms of control framework posits that attention control operates via two distinct processing modes: proactive control involves top-down, sustained use of goal representations to bias attention before stimulus onset, whereas reactive control involves stimulus-driven, transient reactivation of goals to bias attention on an as needed basis. Importantly, research suggests aging is
associated primarily with declines in proactive control. To test this idea, we manipulated list-wide proportion congruency (mostly congruent vs. mostly incongruent) in three different Stroop tasks (color-word integrated, color-word separated, picture-word) featuring neutral trials. Participants were also given a prospective memory intention to look for specific words (e.g., dog) during some lists. Contrary to prior research with younger adults, older adults showed little difference in neutral trial responding or cue detection in mostly congruent versus mostly incongruent lists. These findings suggest that older adults had difficulty in implementing top-down control to modulate word reading. The costs and benefits of age-related declines in proactive control on performance will be discussed along with the implications of these findings for theories of cognitive aging.

**Authors:**
Hunter Ball
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2: The effects of physical fitness on age-related declines in executive processes of working memory: A fMRI study on cue predictability, updating and switching

**Poster Session:** C

**Presenter:** Chandramallika Basak, University of Texas at Dallas, Center for Vital Longevity

**Keywords:** Brain reserve, Cognitive Control, Exercise and Fitness, Neuroimaging: Functional, Working Memory

**Abstract:** This study was designed to determine whether physical fitness could protect against age-related declines in executive control processes, and if so, what is the underlying neural mechanism for such protective effects. We investigated fMRI activations using a hybrid blocked and event-related design 2-Match task. Three different types of executive processes were evaluated during working memory: cue-predictability (Predictable vs. Unpredictable), updating, and switching. We also investigated age-related differences in neural modulation on separate and combined effects of switching and updating. We recruited 48 adults: Young, Low Fit Old (LF) and High Fit Old (HF); n=12 in each group. HF and LF groups were recruited based on their Metabolic Equivalent of VO2Max. LF had lowest performance, esp. in predictable condition; HF and Young had similar performances. Whole-brain fMRI analyses identified distinct fitness-sensitive brain regions associated with predictability, updating, and switching-plus-updating. LF showed greater maladaptive overactivation in right supramarginal gyrus during predictable 2-match; this region was disengaged in HF and Young. In contrast, HF showed compensatory overactions in right middle occipital gyrus and left occipital fusiform gyrus during predictable and update conditions, respectively. HF also showed maintained activations in updating regions. No fitness-sensitive regions were observed for Switching, the least effortful control process; trials requiring both switching and updating were most effortful. Left middle frontal gyrus showed increased neuromodulation with cognitive effort in both HF older adults and YA, however the pattern was staggered. Our results implicate that fitness is an important modifier of the CRUNCH model.

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3: Age differences in sensitivity to semantic satiation

**Poster Session:** C

**Presenter:** Sheila R Black, University of Alabama, Psychology Department

**Keywords:** Semantic Memory, Attention
Abstract: Age-related changes in sensitivity to semantic satiation were examined within the context of a word judgment task. A prime or to-be-satiated word (e.g., ANIMAL) was presented repeatedly for an average of 2.5, 12.5, or 22.5 times. Afterward, a word triad comprised of two related words (e.g., PURPLE, YELLOW) and one unrelated word (e.g., DOG) was presented. The two related words were designated as nontargets or context words in the display and the unrelated word was the target. Participants were instructed to indicate as quickly and as accurately as possible which of the words in the triad was the unrelated word by pressing a key which was spatially compatible to the position of the stimulus on the CRT. For young but not older adults, there was an attenuation of priming effects in the response latency data as repetition of the prime increased. These results were interpreted as evidence that older adults are less sensitive to the semantic satiation phenomenon than young adults.

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4: Strategic Prioritisation Enhances Young and Older Adults’ Visual Feature Binding in Working Memory
Poster Session: C
Presenter: Louise A Brown Nicholls, University of Strathclyde
Keywords: Working Memory, Visuo-Spatial Abilities, Associative Binding, Attention, Strategy Use
Abstract: Young (18-33 yrs) and older (60-90 yrs) adults’ ability to retain visual feature bindings in working memory was assessed, as was the extent to which memory could be enhanced using strategic prioritisation. The task involved sequentially presenting three coloured shapes, followed by a test probe in the form of an individual colour or shape, and participants were asked to recall the accompanying feature. Based on previous evidence, the earlier sequential objects are most vulnerable to forgetting, and in older adults this is especially so for the middle object. In Experiment 1, participants were instructed either to focus on all objects equally, or to prioritise a particular object in the array that was deemed more valuable (i.e. more ‘points’ would be awarded if that object was probed and recalled correctly). As older adults may not be as strategically flexible as young adults, they might differentially benefit from instructions to focus attention on certain objects, especially for the most vulnerable ones. As expected, young adults outperformed older adults overall. A general recency effect was also found, and the poorest performance was observed at the middle serial position. Additionally, both age groups were equally able to prioritise an object in visual working memory, with the largest effects observed at the most vulnerable middle position. Experiment 2 investigated the effect of increasing encoding time. This replicated the findings from Experiment 1, but further showed that, under these conditions, processing speed does not limit older adults’ ability to benefit from strategic prioritisation.

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5: Inhibition and aging: Age-related similarity in attention under cross modal conditions.
Poster Session: C
Presenter: Elisa Butoyi, Nipissing University
Keywords: Implicit Memory, Attention, Frailty
Abstract: This study was designed to assess age-related differences in inhibitory abilities when attending to the visual modality while ignoring the auditory modality. We included two priming conditions and then a final condition assessing the influence of the priming. In the fully attended priming condition, participants heard sentences and identified the first letter of the final target word. In the ignored priming condition, participants counted stars presented on the screen while ignoring numbers and sentences presented over headphones. Then, implicit memory for the sentences previously presented as either attended or ignored information was assessed by having participants identify the final word of degraded sentences (degraded by filtering to remove all but a narrow 1-octave band of frequencies centered at 500 Hz). One-third of the sentences had been primed in the attended priming condition, 1/3 had been primed in the ignore condition, and a final 1/3 were new sentences that had not been encountered previously.

Younger and older adults were similarly distracted by the auditory information presented as irrelevant background information while they counted stars on the computer screen. In terms of their implicit memory for previously presented attended and unattended sentences, both age groups demonstrated a similar effect for attention in which sentences primed as attended sentences were identified most easily, while sentences primed as ignored sentences were more readily identified than new (baseline) sentences. Implications of this research on the inhibitory deficit hypothesis will be discussed.

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6: Phenomenology of retrieval as memories for recent public events transition from events to knowledge: Evidence from older and younger adults

Poster Session: C
Presenter: Jen Coane, Colby College
Keywords: Knowledge, Memory, Semantic Memory, Episodic Memory

Abstract: Older adults typically perform worse than younger adults on both measures of episodic memory and on episodic metacognitive tasks (e.g., feeling-of-knowing). Conversely, performance on tasks tapping into semantic memory and semantic metacognition is often equivalent across age groups, and, in some cases, older adults out-perform younger adults. Traditional semantic memory tasks assess crystallized knowledge (e.g., general knowledge, vocabulary). Memory for recent public events straddles the boundary between episodic memory, given its contextualization in time and space and the phenomenological signature of “remembering,” while also becoming integrated into the knowledge base and sharing characteristics with semantic memory. In the present studies, we examined memory accuracy and phenomenological characteristics of memory retrieval successes and failures for events occurring over the previous decade. Older adults’ memory for these events remained stable over a 2-year period, whereas younger adults’ correct retrieval declined. More retrieval failures were labelled as “not known” than “not remembered.” Subsequent recognition performance indicated that not remembered items were more likely to be identified correctly than not known items, with older adults showing better calibration than younger adults. “Know” responses were associated with higher accuracy and fewer errors whereas “Remember” responses were associated with higher errors and lower accuracy. Thus, memory for recent, public events reflect characteristics of episodic and semantic memories and allow researchers to examine transitions of memories between stores. Furthermore, these kinds of memories show preservation of both overall memory and metacognitive functioning in aging.

Authors:
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7: Preparing for the Worst: Evidence that Older Adults Proactively Downregulate Negative Affect

**Poster Session:** C

**Presenter:** Brittany Corbett, Georgia Institute of Technology

**Keywords:** Positivity Effect, Emotion and Affect, Neuroimaging: Functional

**Abstract:** Previous studies have only investigated age-related differences in emotional processing and encoding in response to, not in anticipation of, emotional stimuli. In the current study, we investigated age-related differences in the impact of emotional anticipation on affective responses and episodic memory for emotional images. Young and older adults were scanned while encoding negative and neutral images preceded by cues that were either valid or invalid predictors of image valence. Participants were asked to rate the emotional intensity of the images and to complete a recognition task. Using multivariate behavioral partial least squares (PLS) analysis, we found that greater anticipatory recruitment of the amygdala, ventromedial prefrontal cortex (vmPFC), and hippocampus in older adults predicted reduced memory for negative than neutral images and the opposite for young adults. Seed PLS analysis further showed that following negative cues older adults, but not young adults, exhibited greater activation of vmPFC, reduced activation of amygdala, and worse memory for negative compared with neutral images. To the best of our knowledge, this is the first study to provide evidence that the “positivity effect” seen in older adults’ memory performance may be related to the spontaneous emotional suppression of negative affect in anticipation of, not just in response to, negative stimuli.

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8: The Temporal Characteristics of the Central Auditory Integration Window for Linguistic Information in Younger and Older Adults

**Poster Session:** C

**Presenter:** Amy Czaikowski, Nipissing University

**Keywords:** Beliefs about Aging, Central Auditory Integration, Filtered Speech, Time Difference

**Abstract:** In previous research, we demonstrated that younger and older adults had a rather large temporal integration window in which they could merge auditory information to effectively understand degraded speech. We presented sentences that had been filtered in two ways: one filter passed a 1-octave band centered at 500 Hz while the other filter passed a 1-octave band centered at 4000 Hz. When the stimuli were presented singly, identification accuracy for high context sentences was 40%, while presenting these two filtered versions of the same sentences simultaneously resulted in a significant increase in identification accuracy which was close to 90%. After introducing a temporal delay, earlier testing demonstrated that younger and older adults maintained the ability to combine stimuli up to 16 ms while the two age groups differed significantly at 64 ms. In this study we have attempted to find where the decline in accuracy begins for the two age groups. We presented the same passbands but used delays of 20, 25, 32, 40 or 55 ms to determine when the decline begins. Both groups had much larger windows than anticipated with the younger adults demonstrating the largest window, maintaining performance up
to 40 ms. Older adults effectively merged information despite the delay between the sentences being presented up to 25 ms. While the window is much larger than was initially expected, older adults demonstrate a significantly smaller window than younger adults.

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**Poster Session: C**
**Presenter:** Kell G Da Costa, Tufts University

**Keywords:** Exercise and Fitness, Cognitive Impairment, Neuroimaging: Functional, Cognitive Decline, Frailty

**Abstract:** Motoric Cognitive Risk Syndrome (MCR) is characterized by slow gait and subjective cognitive complaints and has shown to predict dementia in older adults. Although studies have shown how physical exercise programs can positively affect motor and cognitive domains, no study has investigated how exercise can affect brain function during exercise in older adults with MCR. Thus, in this study, we investigated how the brain area responsible for high-order cognitive function (i.e., prefrontal cortex) is affected during cycling exercise in older adults with MCR. Thirteen older adults (Age: 75.5 ± 7.5 years; BMI: 31.7 ± 4.9 kg/m2; 90 % Women) diagnosed with MCR (Gait speed (4m): 0.53 ± 0.12 m/s; Modified Mini-Mental score (3MS): 91.4 ± 6.9) performed an incremental submaximal cycling exercise while acquiring prefrontal hemodynamics through functional near-infrared spectroscopy (fNIRS). Results showed that participants cycled for 5.44 ± 0.58 minutes achieving a submaximal load of 54.92 ± 14.93 watts, heart rate (91.8 ± 24.1 bpm) and rate of perceived exertion (14.3 ± 1.79). Brain hemodynamics was analyzed at baseline, 50% of exercise and at the end of exercise by changes in concentration of Oxyhemoglobin (O2Hb), Deoxyhemoglobin (dHb) and total hemoglobin (Hbt). Results show a trend of decrease in the O2Hb and Hbt and an increase of dHb while exercising. The preliminary results of this study indicate that physical exercise at light and moderate-intensity seems to decrease prefrontal cortex oxygenation in older adults with MCR. Future studies with larger sample size are necessary to confirm these results.

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**Poster Session: C**
**Presenter:** Ryan T Daley, Boston College

**Keywords:** Emotion and Affect, Social Cognition, Memory, Individual Differences, Neuroimaging: Functional

**Abstract:** Frontal lobe function is associated with processing but not encoding of socioemotional information.
Abstract: Individual differences in older adults’ (OA) executive functioning abilities, linked to the lateral frontal lobe (FL), are associated with good memory performance for neutral material (Glisky et al., 1995). It is less clear how these abilities relate to socioemotional memory. First we asked: how does FL function relate to neural engagement during socioemotional processing; would those with higher FL function show stronger activity within default mode network (DMN) regions when processing self-relevant information, consistent with a FL role in integrating information into a self-concept? Second, does FL function relate to behavioral memory enhancements for socioemotional information? On one hand, FL function may support memory for socioemotional information, due to the top-down processing required to associate information to the self (Schmitz & Johnson, 2007). On the other hand, socioemotional content may be encoded relatively automatically, reducing FL reliance. To answer these questions, OAs received neuropsychological testing and underwent an fMRI scan while viewing images of emotional and neutral objects using self- or other-relevant encoding conditions. Outside the scanner, participants received a surprise memory test. Individual differences in FL function did not relate to socioemotional memory enhancement. However, FL function did correlate with increased activation in DMN regions during the processing of self-relevant information. These results suggest FL function relates to how self-relevant information is processed, but those differences do not convey memory benefits.

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11: Time of Day does not Impact Creative Performance in Successfully-Aging Older Adults  
Poster Session: C  
Presenter: Cassandra Dinius, Southern Illinois University  
Keywords: Creativity, Attention, Lifestyle Correlates, Executive Function  
Abstract: Age significantly impacts performance on executive control tasks, especially ones that draw on inhibition. In older adults, inhibitory performance is particularly sensitive to fluctuating arousal levels that coincide with circadian rhythm (Synchrony Effect). As such, time of day may influence performance on tasks that rely on cognitive control. Creative thinking tasks require integrating diverse concepts and filtering the generated ideas for appropriateness. Assessments of executive function, inhibition, and creativity were administered to successfully-aging older adults. Using a within-subjects design, participants completed assessments when inhibitory performance was expected to be ideal (synchronous) and also when inhibitory performance was expected to be reduced (non-synchronous). Performance on inhibitory tasks did not differ across testing times. Time of day did not significantly impact creative fluency, flexibility, or originality. Measures of attention and processing speed did differ across time of day, with synchronous testing times exhibiting better performance than non-synchronous times. This may indicate that successfully-aging older adults exhibit less of an inhibitory deficit relative to a typically-aging population. Implications of cognitive contributors to creativity will be discussed.  
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12: Examining the Neural Correlates of Metamemory Overconfidence in Older Adults  
Poster Session: C  
Presenter: Hillary Erwin, The University of Alabama
Keywords: Metacognition, Learning, Cognitive Control, Memory, Neuroimaging: Functional

Abstract: Metacognition refers to the awareness of one’s own thought processes and includes knowing when to use certain strategies for effective learning. One common way to measure metacognition is via judgments of learning (JOLs)—the subjective ratings regarding whether information will be remembered later. Prior research has implicated the medial prefrontal cortex (mPFC) as being more active when individuals make higher JOLs. Additionally, previous findings suggest that some older adults are more overconfident when providing metamemory judgments, including JOLs. Given the role that mPFC might play in making JOLs, this brain region might also shed light onto the overconfidence effect in older adults. In the present study, data were drawn from the Alabama Study on Risk for Dementia in which middle-aged and older adults were recruited with varying risk for dementia. Because our interest is normative aging effects, risk for dementia will be controlled for in all analyses. All participants viewed a series of faces paired with either an object or a scene. Immediately after viewing each pair, participants provided a JOL on a 1 to 3 scale. Overconfidence will be assessed by comparing predicted memory to actual memory ability. We expect more overconfident older adults to show elevated mPFC activation patterns than less overconfident older adults. These findings could aid in the understanding of underlying cognitive processes and why some older adults show memory accuracy deficits when making daily metacognitive decisions.

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13: Event-Related Potentials Index Neural Dysfunction Impacted by Task Demand in Higher Subjective Cognitive Complaints and APOE ε4 Carriers

Poster Session: C

Presenter: Sarah A Evans, Department of Psychology, Marquette University

Keywords: Memory Complaint, Alzheimer’s Disease, Semantic Memory, Neuroscience: Functional, Apolipoprotein-E ε4 allele

Abstract: Accumulating evidence suggests that healthy older adults exhibit greater activation, particularly within frontal regions, indicative of compensatory neural ‘recruitment’ during successfully completed cognitive tasks. Recruitment is even greater in cognitively intact elders at genetic risk for AD (Apolipoprotein-E ε4 allele). Although subjective cognitive complaints (SCCs) may precede mild cognitive impairment and AD, little neuroimaging evidence exists to demonstrate early changes coexistent with SCCs. Recent studies suggest the P200 component may reflect retrieval of memory and comparison with incoming stimuli for decision-making. Thus, P200 might be ideal for examining the neural signature of SCCs. The current study assessed P200 differences by AD risk (ε4+ v. ε4-) and SCCs (high-SCC v. low-SCC) at fronto-central electrodes in cognitively intact elders during a famous names discrimination task. Task performance was high in all subjects. For non-famous names, high-SCCs had smaller P200 amplitude than low-SCCs, particularly in ε4+. For recently famous names, high-SCCs had greater amplitude than low-SCCs. Therefore, high-SCCs exhibit recruitment during a task that requires less effortful memory retrieval (recent famous) to maintain task accuracy. However, during a task that requires a substantial need for semantic memory retrieval and decision-making (non-famous discrimination), low-SCCs exhibit effective compensatory recruitment in anterior cortex while ε4+ high-SCCs may have exhausted compensatory resources, reaching the asymptote that presages cognitive decline. Indeed, smaller P200 amplitudes for non-famous stimuli were also associated with poorer accuracy within the high-SCC group. Thus, SCCs and P200 ERP amplitude may be valuable indices of risk for future cognitive decline.
14: An assessment of the inhibitory deficit hypothesis of aging using two different measures of implicit memory for unattended background information

**Poster Session:** C

**Presenter:** Brady F Fougère, Nipissing University, North Bay, Ontario, Canada

**Keywords:** Attention, Implicit Memory, Inhibition Deficit Hypothesis

**Abstract:** Two measures of implicit memory were used to assess the processing of unattended words by younger and older adults. Participants first completed a binocular suppression (Bsupp) task including a picture/word (PW) priming phase (identify picture, ignore word), immediately followed by a binocular suppression (Bsupp) phase. In this phase, a mask presented in one eye at the beginning of the trial suppressed the processing of a gradually appearing word (over the course of 1 second) in the other eye. Participants read the target word as soon as it was visible enough to break the binocular suppression caused by the dominant mask in the other eye. Target words in the Bsupp task included words for the target pictures from the PW priming phase, ignored words from this priming phase, and brand new words. After completing all Bsupp task trials, participants also completed a fragment completion task. Some of the fragments could be completed with words originally presented as attended pictures in the PW priming task, some with words presented as ignored words in that same task while the remainder with new words. While both groups identified words representing previously attended pictures significantly faster in the Bsupp task than either previously ignored or new words, only the older adults identified previously ignored words faster than new words. Thus, in the Bsupp task, younger adults demonstrated more effective inhibition than older adults. Neither group demonstrated much implicit memory for the previously presented words in the fragment completion portion of the experiment.

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15: The impact of Alzheimer’s family history, sex, and APOE-4 status, on white matter integrity in healthy older adults

**Poster Session:** C

**Presenter:** Nathaniel J Gallegos, University of Arizona

**Keywords:** Alzheimer’s Disease, Diffusion Tensor Imaging, Neuroscience: Structural, Predictors, Preclinical Alzheimer’s Disease

**Abstract:** It is well-documented that white matter integrity becomes compromised with increasing age. In individuals with Alzheimer’s disease (AD), certain white matter tracts, including the uncinate fasciculus and the inferior longitudinal fasciculus, appear to decline at a faster rate compared to normal aging, and these tracts have been associated with reduced cognitive abilities including poorer memory. The present study investigated how several risk factors for AD – family history, the apolipoprotein e4 allele (APOE-4), and sex – impact white matter integrity in 54 cognitively healthy older adults with and without a family history of AD. White matter integrity was assessed with high angular resolution diffusion tensor imaging, measuring fractional anisotropy, axial, radial, and mean diffusivity. Two white matter tracts, the uncinate fasciculus and the inferior longitudinal fasciculus, were measured based on prior research suggesting that
these tracts are affected early in the progression of AD, as well as among mild cognitively impaired individuals. Using multiple regression models controlling for age and years of education, males and those with the e4 allele had significantly poorer diffusion measures in the inferior longitudinal fasciculus. Additionally, the interaction between family history and sex predicted radial and mean diffusivity in the right inferior longitudinal fasciculus, such that family history only showed a negative effect on diffusivity among males but not females. These results suggest that risk factors for AD may have differential effects across white matter tracts, and that sex is an important demographic variable to consider in understanding risk for age-related changes in white matter integrity.

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16: Lower fractional anisotropy at 5-year follow-up in normal appearing white matter connected to hyperintense white matter clusters in healthy older adults

**Poster Session:** C
**Presenter:** Yunglin Gazes, Columbia University Medical Center
**Keywords:** Diffusion Tensor Imaging, Neuroscience: Structural, White Matter Hyperintensity, Tractography

**Abstract:** While white matter diffusivity measures have been shown to predict hyperintense clusters at a later time, it is not clear whether axon bundles connected to the hyperintense clusters will decline due to Wallerian processes. The current study incorporated FLAIR data, for characterizing white matter hyperintensity (WMH), at baseline, and diffusion weighted imaging data at 5 years from baseline to examine this relationship in a group of older adults (n = 39, age = 65.6 +/- 6.86 years, 22M/17F) with a minimum of total WMH volume greater than 100 mm3. A tractography technique in MRtrix3 was applied that modeled crossing fibers to more accurately delineate white matter fibers. Each hyperintense cluster was used as a seed in the tractography algorithm to identify white matter tracts that are connected to each hyperintense cluster. Then the mean fractional anisotropy (FA) and mean diffusivity (MD) were quantified for all of the connected tracts for each participant. The analysis showed a negative correlation between the volumes of the WMH and FA of the connected tracts, r = -.397, p = .014, after partialing for age. Our results demonstrated that the white matter tracts connected to hyperintense clusters show lower FA over and above that predicted for aging over a 5 year period, and thus consistent with the hypothesis that white matter tracts neighboring hyperintense clusters are more vulnerable to neurodegeneration, likely through Wallerian processes.

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17: Older Adults with Greater Depressive Symptoms Show Increased Functional Connectivity between Anterior DMN and Hippocampus

**Poster Session:** C
**Presenter:** Andrew Gradone, Georgia State University
**Keywords:** Neuroscience: Functional, Depression, Hippocampus

**Abstract:** The anterior medial prefrontal cortex (mPFC) is a well-established node in the anterior portion of the default mode network (aDMN) that is involved in emotion regulation and self-referential cognition. The goal of the current study was to determine how depressive symptoms moderated patterns of
functional connectivity between the aDMN and the rest of the brain at rest in a sample of sedentary community-dwelling older adults. In this study, twenty-eight healthy older adults (aged 60 to 85) with subthreshold depressive symptoms completed the Beck Depression Inventory-2 (BDI-2) and underwent functional magnetic resonance imaging at 3T. Seed-based functional connectivity analyses were conducted in AFNI. A 5mm radius sphere was used to extract an average seed time course from left mPFC and was cross-correlated with the time courses of all other voxels in the brain. Cross-correlation values were normalized and regressed onto BDI-2 values. Results indicated there is greater functional connectivity between right hippocampus and left aDMN in older adults with greater depressive symptoms. Additionally, increased functional connectivity between bilateral temporal poles and left aDMN was also observed for individuals with greater depressive symptoms. Notably, an entire body of literature supports disrupted structure and function of the hippocampus in individuals with major depressive disorder. These findings suggest that the hippocampus may be more functionally connected with aDMN in older adults with even subthreshold symptoms of depression. This pattern of functional connectivity may explain the DMN’s increased role in brooding, rumination, and reflection for individuals living with depressive symptoms.

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18: Adult Age Differences in Working Memory Capacity: Deficits in Peripheral but not Central Storage
Poster Session: C
Presenter: Nathaniel R Greene, Memory and Cognitive Aging Laboratory, University of Missouri
Keywords: Working Memory, Attention
Abstract: Here, we quantify capacities of working memory in young and older adults in a dual-task situation, addressing a debate in the literature as to whether older adults have diminished central (domain-general) or peripheral (domain-specific) capacities in working memory. Across two experiments, 63 young and 63 old adult participants studied visual arrays of colored squares and sequences of unfamiliar tones in quick succession and were instructed to attend to one or both modalities. Memory was assessed with a single-probe change-detection task. We used a recently developed capacity-estimate model (Cowan, Saults, & Blume, 2014) to partition participants’ overall working memory capacity into three components: a peripheral component dedicated to visual information regardless of attention instruction; a peripheral component consistently dedicated to auditory information; and a central component that was allocated to either modality or shared between both, depending on attention instruction. Capacity estimates of the peripheral components were consistently smaller among the older adults, but the central component was stable across both age groups. We contend that older adults require the continued high involvement of attention to maintain information in working memory, impairing their ability to off-load information from the domain-general component to the peripheral components.

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19: Compensatory P200 amplitude in cognitively intact APOE ε4+ older adults on a semantic memory task discriminating famous names.

**Poster Session:** C  
**Presenter:** Tristan A Gregg, Marquette University  
**Keywords:** Semantic Memory, Alzheimer’s Disease, Cognitive Decline, Neuroscience: Functional, Apolipoprotein-E ε4 allele  
**Abstract:** Compensatory models of cognitive aging suggest that increased neural activation in healthy, intact adults at risk for cognitive decline may compensate for underlying neural deficits. Studies using fMRI show even greater activation in healthy carriers of the Apolipoprotein-E (APOE) ε4 allele, a genetic risk for Alzheimer’s disease (AD), relative to non-carriers. There is very little research on ε4 carriers using event-related potentials (ERPs); existing studies on simple sensory and oddball tasks report no ε4 amplitude differences. The P200 component, while not yet well-understood, reflects higher-order perceptual processing modulated by selective attention and has been implicated in recognition memory. Specifically, P200 may reflect comparison of incoming stimuli with information in memory; larger amplitudes are evoked to item “matches” and smaller amplitude for “non-matches”. We examined P200 amplitude during semantic memory in intact ε4+ (n=21) and ε4- (n=21) older adults using a famous name discrimination task. Despite comparable accuracy, ε4+ had larger P200 amplitudes than ε4- at fronto-central electrodes, particularly for non-famous stimuli. This finding indicates less neural distinction of “non-match” vs. “match” in ε4+, with less effective down-regulation of response to novel stimuli. Thus, the results suggest evidence of compensatory activation that helped enable task accuracy, but slower response time in ε4+ carriers, indicative of underlying neural dysfunction. Future ERP research is needed to better understand the timing and mechanisms underlying APOE-related compensatory trajectories.  
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20: Age moderates the coordination between hippocampal and caudate fMRI activity during implicit associative learning

**Poster Session:** C  
**Presenter:** Jenna L Klippenstein, University of California, Riverside  
**Keywords:** Implicit Learning, Hippocampus, Neuroimaging: Functional  
**Abstract:** Our ability to learn associations between events without conscious awareness, termed implicit associative learning (IAL), declines in healthy aging. Functional magnetic resonance imaging (fMRI) studies suggest that age-related learning deficits are accompanied by hippocampal over-recruitment and caudate under-recruitment relative to younger adults. We extended this work here by examining the relationship between hippocampal and caudate activity during early and late stages of learning, separately within 26 younger (20.7 ± 2.3 years) and 21 older (73.6 ± 6.8 years) adults. Participants completed six runs of the Triplets Learning Task during fMRI acquisition. Each trial (“triplet”) consisted of two cues (one of three circles filling in red) followed by a target (one circle filling in green). Participants responded to the location of the target, which was predicted by the cue locations on 75% of trials (high frequency; HF) but not the remaining 25% of trials (low frequency; LF). Behaviorally, age group differences in learning were seen as a smaller difference in reaction time to HF versus LF triplets in older relative to younger adults. Examination of the fMRI data revealed that learning-related activity (HF > LF) in the hippocampus and caudate were positively correlated during both early and late learning for younger adults. In contrast,
these relationships were not significant in older adults during early learning but were more positively correlated during late learning. These results suggest that older adults lessened ability to learn implicit associations is accompanied by a decline in the coordination between two crucial learning systems.

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**21: Age-related changes of EEG time-frequency responses in prospective memory retrieval**

**Poster Session:** C

**Presenter:** Gianvito Laera, University of Geneva

**Keywords:** Prospective Memory, Memory, Attention, Neuroscience: Functional

**Abstract:** Prospective Memory is the ability to form, retain and carry out an intention in the future. Previous studies showed a decrement of prospective memory performance in older adults compared to younger adults using behavioural and electrophysiological measures. However, the electrophysiological studies mainly reported event-related potentials, and thereby ignoring specific oscillatory parameters of neural modulation, measured as the changes of the electroencephalographic (EEG) activity at different frequencies over time, which could be associated with prospective memory in aging. Time-frequency analysis considers the entire electrophysiological signal allowing for a more comprehensive understanding of which neural processes may underlie age-related prospective memory differences. In the present study, two datasets from previous experiments were analysed in order to reveal how prospective memory retrieval modulates electrophysiological activity at different EEG frequency bands and to disentangle whether and how these electrophysiological patterns are affected by age.

In the two experiments, younger and older adults completed a computerized prospective memory task where they had to judge two words as belonging to the same category or not. Additionally, participants had to remember to press a certain key when the words appeared in certain colors. Preliminary results suggest the presence of age-related differences in electrophysiological modulation associated with prospective memory retrieval. Specifically, older adults show decreased electrophysiological frontal and occipito-parietal alpha followed by a decrease of centro-parietal beta, compared to the younger adults. The results are discussed in light of the recent theoretical frameworks of prospective remembering and cognitive aging in general.

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**22: Role of GABA in age-related decline of brain signal variability**

**Poster Session:** C

**Presenter:** Poortata S Lalwani, University of Michigan, Ann Arbor

**Keywords:** Neuroimaging: Functional, Individual Differences, Cognitive Decline, GABA

**Abstract:** Brain signals as measured by fMRI vary considerably from moment-to-moment even in the absence of any task. This brain signal variability is often treated as noise, but substantial evidence now demonstrates that signal variability declines with age and is associated with age-related declines in
cognitive abilities. However, there are substantial individual differences in signal variability within older adults. What is the neurochemical basis of these individual differences in neural variability? Based on computational and animal research we hypothesized that GABA (the brain’s major inhibitory neurotransmitter) might play a critical role in age-related decline in variability. In order to investigate this hypothesis, we recruited 65 older (ages 65+) adults and measured brain signal variability using resting state functional Magnetic Resonance Imaging. We also measured GABA levels using Magnetic Resonance Spectroscopy in the bilateral ventral visual, auditory and somatosensory cortex. In order to investigate the causal link between GABA levels and variability, we pharmacologically manipulated GABA levels in a subset of our sample by administering lorazepam (a benzodiazepine, known to potentiate GABA activity). We found that whole-brain signal variability and GABA levels in the visual, auditory and somatosensory cortex decline with age. Furthermore, brain signal variability in visual cortex is significantly related to ventral visual GABA levels in older adults. Interestingly, we also found that the whole-brain signal variability increases on drug in comparison to placebo. These results are consistent with the hypothesis that age-related declines in GABA levels cause age-related declines in brain signal variability.

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23: Contextual effects on pattern separation in the medial temporal lobe for younger and older adults

Poster Session: C
Presenter: Ashley Lawrence, University of Arizona
Keywords: Context processing, Hippocampus, Memory, Neuroimaging: Functional
Abstract: Pattern separation is the neural ability to store two very similar representations as distinctive, allowing behaviorally for recognition discrimination among stimuli with highly overlapping features. Pattern separation is a proposed function of the hippocampus (Kirwan et al., 2012), and impaired pattern separation may contribute to age related memory changes (Holden & Gilbert, 2012). Aging leads to changes in the perirhinal cortex which may lead to the degradation of detail inputs into the hippocampus that may be important for pattern separation Burke et al., 2018) biasing older adults toward holistic processing. Our results suggest that older adults have more difficulty discriminating similar objects than younger adults. In addition, older adults may be biased by holistic scene information to falsely recognize a similar object as one they have seen before. Additionally, regardless of scene condition, we observed greater BOLD activation for similar objects in younger adults than older adults in both the hippocampus and perirhinal cortex. This is consistent with the theory that older adults receive less detail input fed forward from the perirhinal cortex to the hippocampus. However, it will be important to evaluate how these regions are cooperating during pattern separation task performance to determine whether hypoactivation in the perirhinal cortex may influence pattern separation in the hippocampus in older adults.

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24: Investigating the relationship between dementia risk factors and neural dedifferentiation

Poster Session: C
Presenter: Shayne S-H Lin, University of Alabama
Keywords: Neuroimaging: Functional, Dementia, Neuroscience: Functional

Abstract: Neural dedifferentiation describes the phenomenon that neural patterns becomes less specific in older adults compared to younger adults. However, neural patterns are not always less specific for older adults. Carp and colleagues (2010) have shown that neural specificity is higher in older adults compared to younger adults when performing low memory loading tasks in middle frontal gyrus. Despite the abundant research investigating the relationship between age and neural dedifferentiation, less research has tested whether neural dedifferentiation also increases in adults at risk for dementia. Data was drawn from the Alabama Brain Study on Risk for Dementia where middle-aged and older adults were recruited with varying levels of dementia risk as assessed by 11 self-report factors inquiring participants’ disease status and life style. fMRI data were collected during memory encoding where participants viewed pairs of human faces with either objects or scenes. Multi-voxel pattern analysis was used to create indices of neural dedifferentiation based on the distinction between encoding these two types of picture pairs. In addition to assessing neural dedifferentiation in visual sensory cortex, dedifferentiation presented in the medial temporal lobes (MTL) and the prefrontal cortex (PFC) were also examined due to their involvement in new learning and compensation, respectively. We predicted that sensory regions and MTL will demonstrate a positive linear relationship between dementia risk score and neural dedifferentiation after controlling for age but PFC will show a negative relationship. The proposed study sheds light on how brain function deteriorates in the process of dementia differently from cognitively-normal aging.

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25: Real-Time fMRI Based Neurofeedback Training of Selective Attention in Older Adults
Poster Session: C
Presenter: Tian Lin, Department of Psychology, University of Florida
Keywords: Attention, Training, Neuroimaging: Functional, Neurofeedback

Abstract: Selective attention is crucial in everyday life and declines with age, possibly due to reduced functioning in the dorsal anterior cingulate cortex (dACC). Real-time functional magnetic imaging (rtfMRI) based neurofeedback training has been utilized to train volitional control of activity in targeted brain regions, including the dACC, but research in older adults is currently limited. The present study used rtfMRI neurofeedback to train young (18-30 yrs) and older (over 65 yrs) adults in volitional up-regulation of bilateral dACC activity using a multi-source interference paradigm. For each trial in this paradigm individuals responded to target digits on the computer screen while ignoring distractor digits and emotional faces in the background. In each training trial, participants received contingent neurofeedback in the form of reward points derived from BOLD signal reflecting the difference between the current training trial and baseline trials (conducted at the start of the run) in bilateral dACC relative to BOLD signal in primary auditory cortex (control region). Participants completed thirty-six training runs across seven training sessions/days. Preliminary results suggest that the majority of both young and older participants show a linear increase in total reward points earned per session across the training, suggesting neurofeedback success (i.e., volitional control over up-regulation of dACC). These findings provide promising first evidence of a potential for functional plasticity in dACC, including in aging, via contingent rtfMRI-based neurofeedback training.

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26: Age-Related Differences in Functional Brain Network Connectivity During Visual Search

**Poster Session:** C  
**Presenter:** David J Madden, Duke University  
**Keywords:** Neuroimaging: Functional, Attention, Sensation and Perception, Speed of Processing, Response-Time Modeling

**Abstract:** Previous research has reported age-related differences (primarily decline) in functional brain connectivity, both in the absence of a task (resting state) and during task performance. Little information is available, however, regarding age-related differences in the reconfiguration of brain networks from rest to task. Here, we addressed this issue in the context of visual search performance. Participants were 59 healthy, community-dwelling individuals 21-78 years of age. Functional magnetic resonance imaging (fMRI) scanning was conducted during both a resting-state period and a visual search task with difficult (conjunction search) and easier (feature search) trials intermixed. Graph theory measures of functional connectivity were obtained from seven independently defined brain networks. We hypothesized that network reconfiguration would vary as a function of both age and the type of network. We measured connectivity both for the search task as a whole, relative to rest, and for the conjunction search and feature search conditions within the task.

During visual search, the connectivity strength within brain networks increased, relative to rest. Increasing age was associated with a significant decline in the magnitude of this task-related reconfiguration of connectivity, for subcortical, default mode, and frontoparietal networks. Within the task, conjunction search required additional between-network connectivity for subcortical and frontoparietal networks, and this task-related connectivity increased with age. We conclude that functional network reconfiguration varies as a function of both age and network, and that different forms of reconfiguration are observed both at the level of the task, relative to rest, as well as within individual task conditions.

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27: Non-combat Military Service in Older Men Impaired Memory and Cognitive Flexibility in a Virtual Morris Water Maze Task

**Poster Session:** C  
**Presenter:** Kathy R Magnusson, Oregon State University  
**Keywords:** Cognitive Decline, Executive Function, Memory, Spatial Memory, Visuo-Spatial Abilities

**Abstract:** This study applied a virtual rendition of the Morris water maze (vMWM) task, which is commonly used for assessing spatial memory performance in rodents, to an examination of age-related differences among younger (18–30 years; N=3-8) and older (60-86 year; N=9-18) male and female human participants and the impact of non-combat military service in older males (N=9) on spatial memory and cognitive
flexibility. Participants performed the Logical Memory task (WMS IV), the NIH Toolbox Cognitive test battery, and cognitive tasks in vMWM task, including long-term memory, reversal, and working memory trials, followed by visible control trials, while seated at a computer desk.

Older males performed significantly worse than young males on Logical Memory I (immediate recall; p=.02). Among older males, veterans performed significantly worse than civilians on the same task (p=.011). There were significant effects of age on all Toolbox measures (p range <.0001 to .05). Older males performed worse than young males (p<.0001) and older male veterans performed worse than older male civilians in the Crystallized Cognition Composite (p=.04). After controlling for age differences with corrected cumulative proximity in visible platform trials, older males showed significantly worse performance than young (p=.01) and veterans near significantly worse than civilians (p=.055) on probe trials for long-term memory. Older male veterans also showed poorer performance in reversal trials for cognitive flexibility than older male civilians (p=.028). These results suggest that military service is a hidden variable in studies of cognitive aging and has a negative impact.

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28: Testing the Over-Reliance on Central Attention (ORCA) Hypothesis: Do Older Adults Have Difficulty Bypassing the Central Bottleneck With Especially Easy Tasks?

Poster Session: C
Presenter: François Maquestiaux, University of Franche-Comté, Institut Universitaire de France
Keywords: Attention, Cognitive Control, Multi-Tasking
Abstract: Does aging increase the reliance on attention to carry out tasks, even when those tasks do not need it? To test the hypothesis of over-reliance on central attention (ORCA), we examined the ability of older adults to entirely bypass ideomotor-compatible (IM) tasks. These tasks are often assumed to operate largely automatically for younger adults: the mere presentation of a stimulus (e.g., a left-pointing arrow) directly activates the associated response code (e.g., pressing the left key). In a psychological refractory period (PRP) procedure, younger and older adults performed a slow auditory-vocal Task 1 paired with a fast visual-manual Task 2 that was either IM-compatible or non-IM-compatible. Task-2 compatibility (IM vs. non-IM) was manipulated as a between-subjects factor (Experiment 1) or a within-subjects factor (Experiment 2). In both experiments, we found larger age differences in dual-task performance when Task 2 was easy (i.e., IM-compatible) relative to when it was more complex (i.e., non-IM-compatible), as evidenced by ratio analyses of older and younger adults’ reaction times. We also found that whereas younger adults routinely bypassed the bottleneck (as evidenced by a small PRP effect and a high rate of response reversals), older adults did not. The present findings support the ORCA hypothesis, rather than the generalized slowing hypothesis or specific processing deficits. As cognitive decline sets in, older adults begin trying harder: this extra application of central attention compensates for cognitive decline but can result in applying attention when it is not needed.

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29: Sleep and Hippocampal-Dependent Spatial Navigation

Poster Session: C
**Presenter:** Hannah Maybrier, Department of Psychological & Brain Sciences, Washington University in St. Louis

**Keywords:** Spatial Ability, Sleep Quality, Hippocampus, Strategy Use

**Abstract:** Hippocampal-dependent spatial navigation is particularly affected by advancing age in comparison to striatal-dependent navigation. One potential mediator is an age-related increase in sleep fragmentation (SF), which has been linked to reduced hippocampal neuroplasticity and impaired navigation in rodents. We hypothesized that 1) SF would be particularly associated with reduced performance on a hippocampal-dependent task and reduced use of a hippocampal-dependent spatial navigation strategy, and 2) age effects on hippocampal-dependent navigation would be mediated by SF. We secondarily also examined total sleep time (TST). 7-day sleep data were collected on younger (N=35) and older (N=34) adults with actigraphy watches and processed with the Cole-Kripke algorithm. Spontaneous navigation strategy use was measured in a dual-solution maze task. Hippocampal and striatal-dependent navigation performance were assessed via cognitive mapping and route learning tasks, respectively. Age was associated with decreased hippocampal strategy use, cognitive mapping and route learning performance with greater age effects on cognitive mapping (all ps<.05). SF was associated with decreased cognitive mapping (p=.01), but not with route learning or hippocampal strategy use (ps>.80). SF did not significantly increase with age (p=.421). TST did decrease with age (p=.001), but was not related to route learning (p=.25) or strategy use (p=.432). However, less TST was associated with worse cognitive mapping (p=.016), and mediated age differences in cognitive mapping (p<.05). These results suggest that TST and SF comprise hippocampal-dependent navigation performance but have less of an effect on spontaneous strategy use. Overall reductions in TST may contribute to age differences in hippocampal-dependent navigation performance.

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30: Hippocampal and Entorhinal Cortex Volume Relate to Body Mass Index in Those at Genetic Risk for Alzheimer’s Disease

**Poster Session:** C

**Presenter:** Jena N Moody, The Ohio State University Psychology Department

**Keywords:** Alzheimer's Disease, Genetics, Health and Well Being, Hippocampus, MRI

**Abstract:** Body mass index (BMI) has a complex relationship with Alzheimer’s disease (AD); in midlife, high BMI is associated with increased risk for AD, whereas the relationship in late-life is still unclear. To clarify the relationship between late-life BMI and risk for AD, this study examined the extent to which genetic predisposition for AD moderates BMI and AD-related biomarker associations. Participants included 126 cognitively normal older adults at baseline from the Alzheimer’s Disease Neuroimaging Initiative (ADNI) cohort. Genetic risk for AD was assessed via polygenic hazard score (PHS). AD-related biomarkers assessed were volume of medial temporal lobe regions and cerebrospinal fluid (CSF) biomarkers. Hierarchical linear regressions were implemented to examine the effects of BMI and PHS on AD-related biomarkers. Results showed that BMI moderated the relationship between genetic risk for AD and volume of medial temporal lobe regions, such that individuals with high BMI and high PHS showed lower volume in the entorhinal cortex (P = 0.013) and hippocampus (P = 0.010). In sex-stratified analyses, these results remained significant only in females. Finally, BMI and PHS were independently associated with CSF biomarkers of AD. These results provide evidence that high BMI is associated with lower volume in AD-vulnerable brain regions in individuals at genetic risk for AD, particularly females. The presentation will discuss the possibility that genetic pathways of AD may be exacerbated by high BMI.

**Authors:**
31: Age-Related Differences in Cognitive Control: An ERP Study of Internally Directed Attention  
**Poster Session:** C  
**Presenter:** Monica Nelson, University of South Florida, University of North Carolina at Charlotte  
**Keywords:** Cognitive Control, Attention, Working Memory, EEG  
**Abstract:** There is increasing interest regarding the relationship between attention and working memory (WM; Kiyonaga & Egner, 2013). Moreover, aging is associated with declines in WM and cognitive control (Braver & Barch, 2002). The first aim was to provide evidence of the relatedness of attention and WM by measuring behavioral and electrophysiological markers (i.e., event-related potentials [ERPs]) in a modified Stroop task (interference from color names in WM when identifying color patches; developed by Kiyonaga & Egner, 2014). A second related aim was to determine the extent of age-related differences in behavioral and ERP measures of WM interference on the perceptual task (young adults [n = 26], older adults [n = 16]). The aims were investigated within the Dual Mechanisms of Control Theory (Braver, 2012) in which proactive and reactive control effects can be isolated by manipulating the proportion of congruency (Gonthier, Braver, & Bugg, 2016). Prior research indicates an age-related deficit in proactive control. Results indicated that older adults had a smaller Stroop interference effect than young adults (contrasting usual patterns), young adults yielded an N2 ERP effect whereas older adults did not, and the Stroop interference effect was only modulated by proportion congruency for young adults. The results indicate that ERP markers associated with the WM task may differ from traditional Stroop tasks. Further, older adults may be less likely to employ proactive control over interference from WM in perceptual processing.  
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32: Late Event-Related Potentials During Semantic Memory Reveal Compensatory Activation in Healthy Older Adults Carrying the Apolipoprotein-E ε4 Allele  
**Poster Session:** C  
**Presenter:** Elizabeth R Paitel, Marquette University  
**Keywords:** Semantic Memory, Alzheimer’s Disease, Neuroscience: Functional, Cognitive Decline, Apolipoprotein-E ε4 allele  
**Abstract:** In support of compensatory models of cognitive aging, fMRI research demonstrates increased activation in healthy elders, particularly in the frontal lobes, during tasks of semantic and episodic memory and executive functioning, despite successful task performance. Intact elders with risk for Alzheimer’s disease (via Apolipoprotein-E (APOE) ε4 allele) exhibit even greater evidence of neural ‘recruitment’. Event-related potentials (ERPs) will expand upon fMRI research by adding direct assessment of neural activity and excellent temporal resolution, to compliment the spatial specificity of fMRI. ERP research with intact ε4 carriers is scarce, focused almost exclusively on early ERPs (£ 300ms), reflecting sensory and automatic processing. One study with a more complex odor-image congruency task highlighted larger N400 (300-600ms) amplitudes in ε4+ vs. ε4- groups, targeting later semantic/memory processing. Their
results suggested compensatory recruitment. Thus, later ERPs during more complex cognitive tasks may be key to capturing early evidence of neural compensation associated with risk for future cognitive decline. We used a famous name discrimination task in healthy, intact elders (21 ε4+; 21 ε4-) to assess frontal lobe activation in late ERP components relevant to semantic memory: N400 (300-600ms), late positive component (LPC/P600; 500-800ms; recognition memory), and late posterior negativity (LPN; 800-1600ms; memory retrieval). Consistent with fMRI research, LPC and LPN amplitudes were larger in the ε4+ compared to ε4- group, despite comparable task accuracy. Thus, future research with later ERPs and more complex cognitive tasks are crucial for understanding the neural processes underlying APOE-related compensation and early biomarkers of future cognitive decline.

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33: The Impact of Glucose Levels and Sex on Brain Volume and Cognition
Poster Session: C
Presenter: Colleen Pappas, Iowa State University
Keywords: Neuroscience: Structural
Abstract: Type II diabetes and high glucose levels have been linked to poorer cognitive performance and greater risk of developing dementia. Additionally, there has been increased interest in investigating sex differences among risk factors for Alzheimer’s disease. The current study tested the relationship between fasting glucose levels and glycosylated hemoglobin A1c (HbA1c), brain volume, and fluid intelligence among 15,506 UK Biobank data participants. Sex and sex hormone interactions were also tested to evaluate differential effects on glucose measures. Multiple linear regression controlling for age, sex, intracranial volume, and white matter hyperintensites was done. Education replaced intracranial volume for the fluid intelligence measure. Overall, higher fasting glucose was associated with less total grey matter and regional grey matter volume in amygdala and parahippocampus. HbA1c was similarly associated with less total grey matter and regional volume in the hippocampus and parahippocampus. Further, higher HbA1c levels predicted poorer fluid intelligence performance. Surprisingly, sex interactions indicated that higher HbA1c levels were more strongly related to less brain volume among men for hippocampus and amygdala. In a subset of participants (n=13,858), testosterone and/or oestradiol levels were tested as moderators. Among men, higher testosterone and higher HbA1c were associated with less volume in the amygdala. Higher oestradiol and higher fasting glucose levels were associated with less hippocampal grey matter among females, whereas higher testosterone and higher fasting glucose levels were associated with less grey matter in the amygdala. Overall, results indicated sex-specific effects of glucose on brain volume, particularly in temporal regions, modulated partly by sex hormones.
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34: Other-age effect in perceptions of facial trustworthiness
Poster Session: C
**Presenter:** Didem Pehlivanoglu, University of Florida  
**Keywords:** Decision making, Emotion and Affect, Person Perception, Human Computer Interaction, Biometrics  
**Abstract:** A processing advantage associated with one’s own-age group (“own-age effect”) has been shown in various domains including face recognition (Rhodes and Anastasi 2012), trust-related decision making (Slessor et al., 2013), and cooperation (Bailey et al., 2016). While previous research on face perception related to emotional intensity reported the own-age effect (Ebner et al., 2011), whether this bias would play a role in evaluations of facial trustworthiness is currently not known. To address this gap, young, middle-aged, and older adults were recruited through Amazon Mechanical Turk and asked to rate trustworthiness of up to 1026 faces varying in age, gender, and facial emotion (FACES database; Ebner et al., 2010). Results suggested an “other-age effect”, in that young (vs. middle-aged and older) raters evaluated older faces as more trustworthy, while older (vs. middle-aged and young) raters evaluated young faces as more trustworthy. This other-age effect was further modulated by facial emotion in that higher facial trustworthiness ratings for other-age (young) faces by older raters was observed for happy faces, while higher facial trustworthiness ratings for other-age (older) faces by young raters was observed for angry and sad faces. These findings suggest an age-differential impact of facial emotion on perceived trustworthiness (Rohr et al., 2019). Extending these results in future research will allow to determine if intergenerational trust may be adaptive in certain situations. We also currently explore the use of facial analytics methods and machine learning to identify physiological patterns in facial features and their role in the observed other-age effects.

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**Presenter:** Florent FP Pinard, Université de Tours, UMR-CNRS 7295 CeRCA  
**Keywords:** Episodic Memory, Aging, Self-Esteem, Anxiety  
**Abstract:** Episodic memory is a component of autobiographical memory (Conway, 2005) vulnerable to the effects of aging. Age effects have been recently shown to be modulated by some individual characteristics such as cognitive, psycho-emotional status and psycho-social environment. In this study, we investigated the combined effects of age and a psycho-emotional variable: Self-Esteem. We also examined the contribution of anxiety levels in the influence of Self-Esteem on episodic memory performance during aging.

Young and older adults completed a Self-Esteem questionnaire (Rosenberg’s Self-Esteem scale, 1965) and the Hospital Anxiety-Depression Scale (HADS, Zigmond & Snaith, 1983). Forty weakly associated word-pairs (target-cues, e.g., child-pediatrician) were used to assess memory (cued recall and recognition tasks). The effects of Age group and Self-Esteem on recall and recognition scores were analyzed with a GLM showing that Self-Esteem only affected recall in young adults while it only affected recognition in older adults. In the younger adults, a regression analysis indicated that Anxiety fully mediated the effect of Self-Esteem on the recall scores, while in the older adults, both Self-Esteem and Anxiety contributed to...
This study thus revealed different patterns of Self-Esteem effect according to the age group. Indeed, in the younger adults, the effect of Self-Esteem on recall is accounted by Anxiety. In young adults, Self-Esteem and Anxiety seem to be overlapping dimensions. On the other hand, in the older adults, both factors independently influenced recognition suggesting that older adults are particularly sensitive to the factors associated to the Self.

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36: Which is More Important to n-back Performance: Changes in BOLD or Changes in BOLD Synchronization?
**Poster Session:** C
**Presenter:** Ekarin E Pongpipat, Center for Vital Longevity, School of Behavioral and Brain Sciences, The University of Texas at Dallas
**Keywords:** Neuroimaging: Functional, Working Memory
**Abstract:** We recently reported that up-modulating brain activation to increasing n-back load (positive-modulation) is associated with better n-back performance for middle-aged and older adults, whereas upmodulating deactivation to increasing n-back load (negative-modulation) is associated with better n-back performance regardless of age. We also recently found that increased negative functional connectivity (FC) between the fronto-parietal (FPN) and default mode (DMN) networks as n-back load increases is associated with better performance for middle-aged and older adults. However, the relative contributions of functional connectivity, positive, and negative BOLD modulation to working memory (WM) performance, beyond the effects of aging, is unknown. Thus, we examined these BOLD features during n-back performance (spanning four levels of WM load) in 170 healthy adults (20-94 years). To determine which BOLD feature was most important for performance, we utilized separate and then combined hierarchical regression. Using separate two-step hierarchical regressions, positive-modulation and FPN-DMN FC significantly explained more variability in performance than age, while negative-modulation did not. Using a combined 3-step hierarchical regression, both positive-modulation and negative-modulation significantly explained 13.03% additional variance in performance than did age. FC between FPN and DMN significantly explained a further 5.14% of variance in WM performance. From both results, positive-modulation and FPN-DMN FC explained more variance in performance than age. However, positive-modulation explained slightly more variance than FPN-DMN FC. Taken together, both changes in BOLD (positive-modulation) and changes in BOLD synchronization (FPN-DMN FC) to increasing WM load serve as important and unique brain functional contributors to WM performance across the adult lifespan.

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37: Attentional control performance and cardiovascular risk in community-dwelling older adults
**Poster Session:** C
**Presenter:** Kristoffer Romero, University of Windsor  
**Keywords:** Cognitive Control, Attention, Assessment, Vascular Cognitive Impairment/Stroke, Cognitive Impairment  
**Abstract:** There is pressing need for earlier detection of cognitive impairments due to neurological disorders and chronic diseases. The presence of cardiovascular risk factors in older adults affects white matter tracts implicated in fronto-parietal attentional control networks, and also increases the likelihood of later developing dementia. Current gold-standard cognitive tests do not map well onto contemporary models of cognitive control and may not be sufficiently sensitive to detect subtle cognitive decline due to poor cardiovascular health. Recent evidence in patients with early-stage Alzheimer’s disease suggests reaction time intra-individual variability (RT-IIV) may be very sensitive to subtle attentional control deficits. However, no studies to date have examined the influence of aging and cardiovascular risk factors on RT-IIV across a variety of attentional control tests. To this end, healthy older adults with varying levels of cardiovascular risk were given tests of selective attention, divided attention, and task switching, along with cognitive functioning questionnaires. In general, more cardiovascular risk was associated with slower RTs on a test of divided attention, and with greater RT-IIV on a test of task switching. These results were not due to group differences in demographic variables, global cognitive functioning, or mood. Overall, the data suggest that experimental cognitive control tasks have potential utility as clinical tools in the earlier detection of cognitive impairment due to the subtle effects of poor cardiovascular health on the brain.  
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38: Alertness Training Increases Visual Processing Speed in Healthy Older Adults  
**Poster Session:** C  
**Presenter:** Adriana L Ruiz Rizzo, Ludwig-Maximilians-University Munich  
**Keywords:** Training, Attention, Neuroimaging: Functional, Individual Differences, Brain reserve  
**Abstract:** Visual processing speed decreases with aging. As it is an essential cognitive function for the performance of most cognitive tasks and daily living activities, it is crucial to evaluate effective means to counteract this decrease. Here, we investigated whether alertness training increases visual processing speed in healthy older adults (study 1) and whether pre-training ongoing activity in the cingulo-opercular brain network, whose functional connectivity (FC) is related to visual processing speed, is predictive for individual training gain (study 2). We used the computational framework of Bundesen’s theory of visual attention to quantitatively model and estimate visual processing speed. In study 1, 75 healthy older adults participated in one of three age-, sex- and education-matched groups for alertness training, active control training (visual n-back), or no training. A significant Group×Session interaction indicated an increase in visual processing speed only in the alertness training, but not in the control groups. Visual processing speed did not significantly differ between groups before, but only after training. In study 2, we assessed another sample of 29 healthy older adults who participated in alertness training and underwent resting-state fMRI. The individual level of FC in the cingulo-opercular network was associated with the individual training-induced change in visual processing speed. These results indicate that alertness training counteracts a slowed visual processing in older adults and that FC in the cingulo-opercular network could be used as a neural marker to predict individual training gain, and potentially stratify individuals who profit from training.  
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39: Clinically Studied or Clinically Proven? False Memory for Print Advertisements

**Poster Session:** C  
**Presenter:** Alexander LM Siegel, University of California, Los Angeles  
**Keywords:** False Memory, Memory, Metacognition  
**Abstract:** Over-the-counter dietary supplements are a popular method of cognitive enhancement, with a recent national survey revealing that four out of ten adults had used at least one in the previous year. Prior work has demonstrated that participants’ memory for product advertisements is reconstructive and susceptible to misinformation. In the current study, we examined how younger and older adult participants remembered or misremembered information depicted in a memory enhancement product advertisement. Younger adults were undergraduate students at UCLA and older adults were recruited from the local community. Participants viewed the ad for 1 minute and were tested on various details including the name of the brand, the main slogan present, and the presence of a medical doctor. The multiple-choice test was administered immediately after viewing the ad or after a short delay. The critical question was whether the product was “clinically studied” (the phrase actually present), “clinically proven” (the critical lure), “scientifically studied” or “scientifically proven”. While participants were generally correct in the presence of the word “clinically”, participants in both age groups were unable to distinguish between critical phrase and lure, suggesting that they may misremember information in a way that ascribes empirical validity to the product. The present study demonstrates the fallibility of memory after viewing an advertisement for a memory enhancement product across the adult lifespan.  
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40: Age Differences in Cognitive Control: The Effects of Cue Dichotomization and Distinctiveness

**Poster Session:** C  
**Presenter:** Cassandra Skrotzki, Ryerson University  
**Keywords:** Cognitive Control, Aging, Cognitive Decline, Attention, Memory  
**Abstract:** According to the Dual Mechanisms of Control framework, there are two distinct cognitive control modes (Braver, 2012). Proactive control requires the active maintenance of goal-relevant information to prepare an appropriate response, whereas reactive cognitive control uses a late-correction strategy to reactivate the goal-relevant information upon stimulus presentation. Cognitive control use shifts away from proactive and more towards reactive control in older relative to young adults. Past research demonstrates that older adults’ proactive control can be amended or improved using external global task non-specific environmental/strategy support, such as extended practice (Braver et al., 2009) or cue-oriented strategy training in the AX-Continuous Performance Task (AX-CPT, Paxton et al., 2006). However, little is known about whether task-specific manipulations, such as using distinct cues, would
also facilitate older adults’ proactive control. To address this question, two experiments were conducted with young and older adults. In Experiment 1, we compared the standard AX-CPT and a dichotomous letter-cue (i.e., one letter-cue is valid and the other is invalid) AX-CPT. In Experiment 2, participants completed a dichotomous and distinct face-cue letter-probe AX-CPT (i.e., female face-cues are valid and male faces are invalid, or vice versa). The results showed that older adults’ proactive control use improved only in Experiment 2 to a level similar to that of young adults, suggesting that cue distinctiveness, rather than cue dichotomization, is a crucial factor for enhancing proactive control in older adults.

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41: Older adults use intact knowledge to more effectively encode and remember everyday activities

Poster Session: C
Presenter: Maverick E Smith, Kansas State University
Keywords: Attention, Everyday Memory, Knowledge
Abstract: Older adults do not remember everyday event information as well as young adults. Such age-related differences are partially due to failures in how effectively continuous information is encoded (Sargent et al., 2013). Despite these declines, semantic knowledge is a cognitive ability that improves with age. Older adults may rely on their intact knowledge to offset impairments in their perceptual/cognitive abilities. Semantic knowledge has been shown to enhance long-term memory; however, little is known about how knowledge affects moment-to-moment encoding processes. We examined the influence of semantic knowledge on event encoding and long-term memory for everyday events by having thirty young and thirty older adults watch videos depicting actions that were familiar to either older adults (balancing a checkbook, planting flowers) or young adults (installing a printer, setting up a video game console) while their eyes were tracked with an eye tracker. Participants completed tests of their free recall, temporal order, and recognition memory after watching each video. Memory did not differ between age groups for the older adult activities, but older adults remembered less in the young adult activities. Critically, we also found that knowledge influenced gaze similarity - the extent to which people look at the same places at the same time. Gaze similarity did not differ between age groups for the older adult activities, but older adults had less gaze similarity in the young adult activities. Older adults use their intact semantic knowledge to more effectively encode and remember actions in everyday activities.

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42: Associations between hippocampal subfield volume, subjective, and spatial working memory performance in the IGNITE cohort

Poster Session: C
Presenter: Chelsea M Stillman, University of Pittsburgh
Keywords: Hippocampus, Spatial Memory, Subjective Age
Abstract: Subjective changes in memory may appear before any clinically meaningful cognitive changes are evident. However, less is known about how subjective, self-reported memory complaints relate to underlying brain structures that support memory performance. The purpose of this analysis was to examine how subjective memory complaints relate to both task-based spatial memory performance and hippocampal volume, a brain region central to learning and memory. We also examined whether associations were specific to particular subfields of the hippocampus.

Neuropsychological testing and structural MRI scans were collected as part of the multi-site clinical trial, Investigating Gains in Neurocognition in an Intervention Trial of Exercise (IGNITE). Baseline data were available for 351 cognitively normal adults aged 65-80 (M = 69.5, SD = 3.5). Participants completed questionnaires assessing subjective cognitive status (PROMIS and Ecog) and a computerized spatial memory task. Hippocampal volumes were calculated using an automated segmentation algorithm (ASHS) which also estimated subfield volumes, including dentate gyrus (DG), CA1, CA2, CA3, subiculum (SUB), entorhinal cortex (ERC), parahippocampal and perirhinal cortex, and collateral sulcus. After controlling for age, gender, education, intracranial volume, and study site, fewer subjective memory complaints were associated with better spatial memory performance (B=0.11, p=0.03), but not with hippocampal subfield volume. However, spatial memory performance was related to larger hippocampal subfields, including CA1, DG, ERC, and SUB volumes, but not to total volume (p's< .05). These results suggest that subjective memory complaints correspond to performance on computerized memory tests but not hippocampal volume in cognitively normal adults.

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43: Cue Predictiveness and Outcome Uncertainty in Young and Older Adults’ Associative Learning

Poster Session: C

Presenter: Katie Wheeler, Western Kentucky University

Keywords: Attention, Learning

Abstract: Two independent attentional processes operate during associative learning (Pearce & Mackintosh, 2010). Attentional exploitation is based on an assessment of the relative predictability of cues and promotes rapid detection and execution of appropriate responses for reliable predictors. Attentional exploration is based on an assessment of the uncertainty of outcome occurrence for a cue and aids in the identification of information that can reduce uncertainty. Attentional exploitation remains intact in old age (Mutter, Holder, Mashburn, & Luna, 2018), but little is known about attentional exploration. We explored the effect of age on both types of attention in a category learning task. Participants saw pairs of cues and learned to predict whether the pair belonged to one of two categories. Certain pairs were always associated with the same category, whereas uncertain pairs were associated with one category 67% of the time and the other category 33% of the time. Within each pair, one cue was predictive of category membership and the other was non-predictive. The learning task alternated with a dot probe task. Participants saw the same cue pairs, but after a brief delay, a small white square appeared over one of the cues and participants indicated, as quickly as possible, the location of this probe. Attentional capture for both young and older adults was faster for predictive than non-predictive cues.
Moreover, for both groups uncertainty slowed down responses to the probe regardless of the predictive status of the cues. Thus, aging had little effect on attentional exploitation or attentional exploration during associative learning.

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44: Rapid target selection of object categories depends on subtle differences in familiarity

**Poster Session:** C
**Presenter:** Rachel Wu, University of California, Riverside
**Keywords:** Attention, Knowledge

**Abstract:** Although prior studies have shown important neural and behavioral differences when searching for familiar versus unfamiliar objects in experts and novices, little is known about how we interact with objects differently based on subtle variations in familiarity. Two experiments investigated the behavioral and neural effects of searching for modern versus vintage objects in younger and older adults. Younger adults were more familiar with modern objects than vintage objects, and older adults were familiar with both. In general, there were either no behavioral effects or weak effects between modern and vintage categories for both younger and older adults, suggesting that both groups adapt to the task at hand similarly. However, in younger adults, the N2pc ERP amplitude for modern objects was present when searching for modern objects, but not for vintage objects. These results indicate that even subtle variations in prior real-world familiarity impact neural responses when selecting targets, even if behavioral responses are not as affected when completing the fundamental daily task of visual search. In our study, the differences in familiarity were based on prior real-world exposure to modern versus vintage objects in younger adults. These differences are considered subtle because the participants were not complete novices in identifying vintage objects, and their behavioral performance on vintage tasks were relatively high. Despite high behavioral performance for both modern and vintage objects, younger adults selected modern objects faster than vintage objects, as measured via the N2pc ERP component. As more studies clarify the role of familiarity on search, we can better probe how more stable categories (e.g., mammals) and more flexible or ad-hoc categories (e.g., things to pack on vacation) serve the learner’s needs and environmental constraints across the lifespan.

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45: Do I really need to worry about this and why? Understanding the relationship between sensory impairment and cognitive outcomes

**Poster Session:** C
**Presenter:** Alison Abraham, Johns Hopkins University
**Keywords:** Cognitive Impairment, Hearing Loss, Measurement, Visuo-Spatial Abilities, Sensation and Perception

**Abstract:** The brain is integral to nearly every aspect of our lives, contributing to cognitive, physical and social functioning. As a result, there are extensive research efforts to understand diseases processes and
risk factors leading to cognitive impairment and loss of function. What few of these studies acknowledge is the degree to which all studies of cognition are also studies of the senses, as the brain interacts with the world through our senses. This presentation will discuss the burden of hearing and vision impairment in older adult populations and the likelihood that unrecognized sensory impairment is adding to measurement variability of cognitive function. The presenter will show the proposed mechanisms for how hearing and vision impairment may be linked to cognitive function, highlighting both causal and associative correlations. The relevant cognition construct of interest will be explored and the presenter will discuss how our understanding of that construct as well as the research question of interest will drive how sensory deficit is incorporated into the measurement process.

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46: What am I measuring? Disentangling cognitive status from sensory impairment
Poster Session: C
Presenter: Alden L Gross, Johns Hopkins University
Keywords: Cognitive Impairment, Hearing Loss, Measurement, Visuo-Spatial Abilities, Sensation and Perception
Abstract: Sensory impairment in hearing or vision affects 55% of older adults aged 60+, and is known to impair cognitive test performance. Coincidentally, laboratory-based cognitive tests rely to varying extents on hearing, vision, or both abilities. We hypothesized that scores for cognitive tests whose administration or instructions depend on vision (e.g., Trail Making) or hearing (e.g., word list learning) are biased among those with vision or hearing impairment, respectively, after controlling for underlying cognitive performance. To test these hypotheses, we leveraged cross-sectional data on a thorough neuropsychological battery on N=648 men and women from the Baltimore Longitudinal Study of Aging who also had objective diagnostic hearing and vision testing. We used item response theory methods to objectively test for differential item functioning (DIF) by hearing (PTA>25 db in 4 speech frequencies, N=338, 52%) and vision (20/40 or worse, N=77, 12%) impairment. We observed DIF for the Digit Symbol Substitution Test by hearing impairment status. No DIF by visual impairment was evidence in the full sample, but among visually impaired men, it was more difficult to perform at the highest levels of TMT-A, TMT-B, and animal fluency. In conclusion, we identified DIF by sensory impairment for variables that don’t rely on those sensory functions. If biased cognitive tests cannot be identified a priori based on characteristics of the test administration or instructions, cognitive load may be playing a larger role than previously acknowledged.

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47: Variability in Cognitive Performance among Midlife Adults: Comparing Breast Cancer Survivors and Non-Cancer Participants Across
Poster Session: C
Presenter: Giancarlo Pasquini, Stony Brook University, Department of Psychology
Keywords: Assessment, Methods, Measurement, Response-Time Modeling, Mild Cognitive Impairment
Abstract: Cognitive decline may be accelerated among breast cancer survivors following treatment. However, little is known about how cancer survivors and those without a history of cancer differ in daily cognitive performance. This study assessed ambulatory cognitive performance in breast cancer survivors
and an age-matched community sample without a history of cancer (ncancer=47, nnon-cancer=106, age range: 40-64 years, M=52.13 years, SD=6.71) to determine whether cancer status was associated with mean, improvement, and variability in cognitive functioning. Participants completed three ambulatory cognitive tasks measuring spatial working memory, verbal working memory, and processing speed up to five times per day for 14 days.

In multilevel models, average daily spatial working memory performance did not differ by cancer status, but cancer survivors showed better verbal working memory (B=.12, SE=.02, p<.001) and faster processing speed (B=-563.31, SE=126.38, p<.001) on average than non-cancer participants. Spatial working memory (B=-.01, SE=.001, p<.001), verbal working memory (B=.001, SE=.000, p<.001), and processing speed (B=-8.68, SE=.67, p<.001) performance improved on average across the study period. Cancer survivors improved at a faster rate on the spatial working memory task across the study compared to non-cancer participants (B=-.01, SE=.004, p<.01) but not on verbal working memory or processing speed (p's>.17). Using heterogenous variance models, survivors showed lower within person variability in processing speed compared to non-cancer participants. Contrary to lab-based results, these ambulatory results suggest that on some tasks breast cancer survivors in midlife show better average performance, improve more rapidly, and show less within-person variability than participants without a history of cancer.

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48: A questionnaire-based everyday reaction time (q*bert) measure distinguishes those with and without MCI.

Poster Session: C
Presenter: Nelson Roque, Pennsylvania State University, Center for Healthy Aging
Keywords: Assessment, Methods, Measurement, Response-Time Modeling, Mild Cognitive Impairment

Abstract: Experience sampling paradigms provide new opportunity for early identification of MCI. We investigated two research questions: (1) is the total time to complete a repeatedly-administered survey (i.e., questionnaire-based everyday reaction time, q*bert) a reliable and valid measure of cognition?; (2) does this measure distinguish those with and without Mild Cognitive Impairment (MCI)? To answer these questions, we leveraged ecological momentary assessment (EMA) data (N=240) from a 14-day measurement-burst of the Einstein Aging Study, where older adults (Mage = 77) completed 6 daily EMAs on investigator-provided smartphones. Q*bert was found to have good between-person reliability after two days (i.e., ~11 EMAs; reliability = 0.88, ICC=0.41), excellent reliability after three days (i.e., ~ 16 EMAs; reliability = 0.92; ICC = 0.42), as well as at the end of the 14 day measurement burst (i.e., ~56 EMAs; reliability = 0.98, ICC = 0.42). At the between-person level, q*bert correlated with ambulatory cognitive measures of processing speed (r = 0.42, p < .001), spatial memory (r = 0.34, p < .001), and memory binding (r = 0.36, p < .001). Comparing q*bert at the between-person level in those with MCI (N=66) and without (N=174), a significant difference was observed (t(108.68) = 5.016 , p < .001; Cohen’s d = 0.75, 95% CI [0.46, 1.05]). We propose q*bert as a reliable, valid, and unobtrusive way to measure cognition (more specifically, processing speed) when ambulatory cognitive assessments are not feasible.
1: Cognitive Components of the Hopkins Verbal Learning Test in Young and Older Adults

Poster Session: D

Presenter: Lori JP Altmann, University of Florida

Keywords: Learning, Speed of Processing, Executive Function, Working Memory

Abstract: Verbal learning tests assess, not only verbal memory and delayed recall, but strategy use based on semantic categories. Thus, various cognitive abilities besides memory may contribute to performance.

Ninety-nine older adults (age 65-80) and 41 young adults (age 18-22) completed the 3 learning trials of the Hopkins Verbal Learning Test (HVLT) and a delayed recall trial 25 minutes later. They also completed twelve cognitive tasks. Analyses using principle components analysis yielded four underlying factors: working memory (WM), Speed, Fluency, and Inhibition.

Age groups differed significantly in Speed and WM factors and all HVLT measures. Fluency and age group predicted 1st-trial performance. Hierarchical, stepwise regressions allowed the four cognitive factors to enter before age group. 2nd-trial, 3rd-trial, and delayed performance were predicted by fluency, processing speed, and WM (R-squared: .313, .371, and .253, respectively), but not inhibition or age group.

While HVLT scores differed between age groups in all trials, age group only contributed to the variance in the first trial. In subsequent trials, age-related variance was accounted for by differences in speed of processing and WM. The speed and WM factors may reflect individual differences in encoding new information. The pervasive influence of fluency, which included contributions from semantic and letter fluency tasks, suggests that variation in the ability to generate information to fit a particular criterion contributes to performance on this task. The failure of inhibition to account for significant variance suggests it does not hamper recall in verbal learning tasks with embedded semantic categories.

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2: Familiarity for Words and Objects is Impaired in Amnestic Mild Cognitive Impairment in a Recollection-Free Context

Poster Session: D

Presenter: Nicole D Anderson, Rotman Research Institute, Baycrest, Departments of Psychology & Psychiatry, University of Toronto

Keywords: Familiarity, Memory, Amnestic Mild Cognitive Impairment

Abstract: While healthy aging has relatively little effect on familiarity, familiarity deficits would be expected in amnestic mild cognitive impairment (aMCI): Tau pathology appears first in medial perirhinal and lateral entorhinal cortices, regions which show cell loss and cortical thinning in aMCI, and lesions to perirhinal cortex cause familiarity deficits. Results from dual-process paradigms are mixed, however, on whether familiarity is impaired or intact in aMCI. We hypothesized that familiarity deficits will be evident in aMCI (but not healthy aging) when tested in recollection-free contexts, more so for objects than words given the role of the perirhinal cortex in object recognition. Healthy younger and older adults and
individuals with aMCI saw a series of words, non-words, objects, and scrambled objects, each shown 1, 2, 4, or 7 times, and made “real” and “not real” decisions in an incidental encoding task. In a surprise memory test, participants made absolute frequency judgments to each word and object. For both words and objects, frequency judgments increased with actual frequency less steeply in individuals with aMCI compared to healthy younger and older adults. These results confirmed our hypothesis of a familiarity deficit in aMCI in recollection-free contexts, but this was equally true for both material types. In a subsequent study, we will examine familiarity for more highly confusable objects (e.g., one backpack will be shown one time, another backpack four times), in which case we expect greater familiarity deficits in aMCI for objects than words.

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3: Contextual Interference Negatively Impacts Associative Memory Across Age
Poster Session: D
Presenter: Harini J Babu, The Pennsylvania State University
Keywords: Associative Memory, False Memory, Contextual Interference
Abstract: Associative memory involves binding various distinct pieces of information into a single memory trace. While memory for individual items is susceptible to inference from similar, but non-studied, items, there is little evidence demonstrating how similarity with respect to context influences associative recognition. Moreover, it remains to be determined whether older adults, who generally show associative memory deficits and interference from item similarity, are differentially susceptible to contextual interference compared to younger adults. The current set of three studies examined how contextual interference affects associative memory in both older and younger adults. All studies used an item-context paradigm in which participants saw face-scene pairings at encoding, and both targets and recombined lures at retrieval. Contextual interference was operationalized with the use of both similar and distinct scenes as distractors with respect to the recombined lures. We hypothesized that when contexts were similar across encoding-retrieval, both older and younger adults would have a harder time overcoming that interference, resulting in more false alarms, than when the lure context was distinct with respect to the encoding context. Across all studies, while older adults demonstrated an age-related deficit in associative recognition, associative memory was poorer when the lure included a scene similar to the encoding category compared to when the scene was from a different category (i.e., the lure context interfered with recognition) across both age groups. Together, results indicate that similarity in context information interferes with successful associative memory performance across the lifespan.
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4: Emotional suppression interacts with Apolipoprotein-E ε4, reducing executive speed and memory performance in cognitively intact older adults
Poster Session: D
Presenter: Zane Ballard, Marquette University
Keywords: Alzheimer's Disease, Cognitive Decline, Genetics
Abstract: Individual differences in emotion regulation (ER) in response to emotional challenge tend to vary with age. Any of several ER strategies might be utilized, including cognitive reappraisal and expressive suppression. Reappraisal reduces emotional impact early in emotional responding and involves reinterpreting an emotive stimulus. Suppression occurs later and focuses on inhibiting expression of feelings. No one strategy produces more positive outcomes across all situations, but suppression is associated with higher arousal and amygdala activation, less reduction in negative affect, and poorer cognition (memory and executive function), as compared to reappraisal in emotive contexts. Memory and executive function (EF) performance also decrease with age, which could particularly impact elders and, among them, particularly those with greater genetic risk for developing Alzheimer’s Disease (e.g., those carrying the Apolipoprotein-E ε4/APOE4 allele). However, relatively few studies have investigated whether suppression (S) might have cognitive effects. In the current study, a sample of 80 cognitively intact older adults (age 48-86, mean = 69.0, SD = 10.6; 28 males) completed a battery of neuropsychological tests and a measure of S, forming four groups: Low-S/ε4- (individuals lower in suppression and without the APOE4 allele; n=29), high-S/ε4+ (n=15), low-S/ε4+ (n=24), high-S/ε4- (n=12). Covarying age and gender, high-S individuals showed overall slower digit copy speed, and high-S/ε4+ had slower symbol-digit modality performance and poorer overall performance across measures of memory. These results suggest the need for further research to characterize the impact of suppression on cognitive health in aging and implications of genetic risk for dementia.

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5: Are age differences in prospective memory performance due to a general resource deficit or a lack of specific executive abilities?

Poster Session: D

Presenter: Nicola Ballhausen, University of Tilburg, The Netherlands, University of Geneva, Switzerland

Keywords: Prospective Memory, Cognitive Decline, Executive Function

Abstract: Age differences in prospective memory (PM), the ability to remember future intentions, for a long time have been explained by a general resource deficit in older compared to younger adults. However, it is also plausible that a more specific decline of distinct executive abilities rather underlies these age differences. The present study therefore tested younger and older adults’ PM performance in two experiments that posed different demands on the ongoing activity: One experiment varied general ongoing task absorption without involving specific executive functions, and the other one investigated two conditions of high and low task switching demands. Preliminary analyses suggest no larger age effects when ongoing task absorption was high compared to when it was low, but age effects to be present when task switching requirements were high, but not when they were low. Therefore, it seems that the decline of specific executive abilities (in particular task switching) rather than a general shortage in older adults’ processing resources may underlie age differences in PM performance. Results are discussed with regard to their implications for PM aging research as well as for interventions in everyday life of older adults.

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6: Cultural Life Scripts in Patients with Alzheimer’s Disease  
**Poster Session:** D  
**Presenter:** Dorthe Berntsen, Aarhus University  
**Keywords:** Alzheimer's Disease, Everyday Memory, Semantic Memory, Episodic Memory  
**Abstract:** Cultural Life-scripts are culturally shared semantic knowledge of the expected order and timing of major transitional life events in a typical life. This cognitive schema has been shown to serve as an important mnemonic template that guides autobiographical retrieval, especially for positive and important life events. Autobiographical memory deficits are one of the earliest and most prominent symptoms in Alzheimer’s disease (AD). However, no studies have examined cultural life scripts in AD patients, despite semantic memory deficits being reported even in the early stages of the disease. The aim of the present work was to assess life-script knowledge in older adults diagnosed with AD, particularly in terms of knowledge for the content of life script events and the timing and temporal order of these events. Participants diagnosed with AD (n= 21) and healthy controls (n=22) completed the standard life script task: They were asked to imagine an ordinary infant in their own culture and name the seven most important events this infant most likely would encounter during his or her life. Participants also estimated the ages at which the nominated events most likely would occur. AD participants generated fewer life script events overall, and their life script adhered less to cultural norms and were more impaired concerning the timing and order of events compared with healthy older adults suggesting that AD affects both content and temporal organization of life script knowledge. Results are discussed in relation to impaired script comprehension and semantic memory deficits in patients with AD.  
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7: Age effects on memory generalization in a concept-learning task  
**Poster Session:** D  
**Presenter:** Caitlin R Bowman, University of Oregon  
**Keywords:** Memory, Episodic Memory, Knowledge  
**Abstract:** Healthy memory function allows us to remember individual events from the past (memory specificity) and to link related experiences to form knowledge that applies to novel situations (memory generalization). While age reductions in specificity are well established, it is not known how age affects memory generalization. Some propose that specificity and generalization are based on a single memory representation (exemplar models), in which case older adults may be impaired in both types of memory decisions. Others posit that generalized representations form separately from specific ones, discarding details of individual events to form abstract representations (prototype models). If this is the case, older adults may show preserved memory generalization. To test these alternatives, we had young and older adults learn to categorize cartoon stimuli into novel categories. Following the learning phase, subjects completed a generalization test in which they categorized the training items and new items. Results revealed an overall age reduction in categorization performance. However, older adults showed similar levels of accuracy for old and new items, suggesting that older adults generalized as well as would be expected given their accuracy for directly learned information. We also fit formal exemplar and prototype models to categorization responses to measure whether subjects relied on specific or abstract information to make categorization judgments. Young adults were evenly split between exemplar- and prototype-
users, whereas older adults were much more likely to rely on prototype representations. Thus, older adults showed deficits in category learning but no additional deficit in generalization, supported by abstract memory representations.

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8: The Effect of Memory Cue Duration on Directed Forgetting Performance in Healthy Aging
Poster Session: D
Presenter: Catherine Carpenter, The Pennsylvania State University
Keywords: Memory, Directed-Forgetting, Cognitive Capacity
Abstract: Intentional or directed forgetting is a cognitive strategy often used in situations when one is presented with overwhelming amounts of information, not all of which is necessary to remember. Directed forgetting of irrelevant information is an active process that is resource demanding, and studies investigating direct forgetting typically observe age deficits in this type of forgetting. Using an item-method directed forgetting paradigm, we examined the effect of cue duration (one, three, and five seconds) on directed forgetting in both older and younger adults. We found that overall with an increased processing time (three or five), there was an improved directed forgetting performance in both older and younger adults (i.e. participants generally forgot more information that they were told to forget). There was no significant forgetting effect for the one second condition. Further analyses indicate a significant interaction between measures of cognitive functioning in older adults and directed forgetting performance. Specifically, higher functioning older adults were able to utilize the increased processing time to enhance their level of directed forgetting. Together, these results indicate the importance of individual differences in intentional forgetting and in cognitive aging research.

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9: Age-Related Reduction of the Confidence-Accuracy Relationship in Episodic Memory: Disentangling Recollection Difficulty and Stimulus Effects
Poster Session: D
Presenter: Taylor A Chamberlain, University of Chicago
Keywords: Episodic Memory, Metacognition, Memory, Recollection, Source memory
Abstract: The ability to accurately assess confidence during memory retrieval is critical, particularly for avoiding memory illusions. Here, we examined the effect of aging on this kind of metamemory using a forced-choice recollection test for previously encoded words and pictures. Replicating Wong, Cramer, and Gallo (Psychology and Aging, 2012), we found that older adults exhibited worse metamemory compared to younger adults. This impairment persisted even when the groups were matched on recollection accuracy, suggesting that aging may cause metamemory declines beyond what can be attributed to differences in recollection. We also examined the effect of stimulus type on metamemory accuracy, using a within-stimulus manipulation of recollection difficulty (encoding repetitions) so that we could disentangle the extent to which metamemory accuracy differs depending on information processing type, independent from recollection difficulty. That is, we experimentally crossed stimulus type (words,
pictures) with recollection difficulty (high, low). We found the manipulation of recollection difficulty impacted metamemory accuracy, and also, when accounting for recollection difficulty, metamemory for picture and word stimuli was not significantly different for either age group. In conclusion, we found evidence that recollection difficulty impairs metamemory, but also that aging impairs metamemory independent from recollection difficulty. These findings replicate and extend the conclusions of Wong et al. In addition, we did not consistently find that pictures yielded superior metamemory than words when these formats were matched on recollection accuracy. These findings suggest that prior results demonstrating a picture superiority effect on metamemory may have been confounded with picture effects on recollection difficulty.

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10: A change of how and what: choices we make as we grow older.

**Poster Session:** D

**Presenter:** Jaimie Choi, University of Alabama

**Keywords:** Decision making, Emotion and Affect, Applied Cognition

**Abstract:** Decision-making is one of the most important and basic functions of human behaviors, yet the composition of decision-making processes can be quite complex. In order to make a decision, one must survey and acknowledge the situation, comprehend the need and situation for a decision, and search potential options, evaluate them and sort out the most optimal decision. When decision-making becomes difficult due to conflicting values or ideas, the cognitive load that the decision-making process requires can become taxing. Heuristics, a cognitive shortcut that simplifies decision-making process, can be implemented in order to conserve the cognitive effort. It is well documented how people with little cognitive capacity, such as older adults, tend to rely on heuristics. We examined whether there is a difference in types of heuristics older adults utilize when making difficult decisions in comparison to young adults, as well as situations in which they stop relying on heuristics. Also, we examined whether older adults would prefer to choose certain types of information, for instance, more positive options than negative options compared to younger adults. The results indicate that as we grow older, the decision-making processes and options we choose may change within a difficult decision-making paradigm.

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11: Sleep Efficiency and Cognition in Sedentary Middle-aged and Older Adults: Moderating Roles of Pain and Physical Activity

**Poster Session:** D

**Presenter:** Ashley F Curtis, University of Missouri

**Keywords:** Sleep Quality, Executive Function, Speed of Processing, Pain, Exercise and Fitness

**Abstract:** This study examined whether self-reported sleep efficiency independently predicts or interacts with pain or physical activity to predict cognitive performance in sedentary middle-aged and older adults. Seventy-six sedentary adults aged 50+ (Mage=63.1, SD=8.8) completed 14 daily diaries measuring self-reported sleep and pain. Weekly average sleep efficiency and pain computed. Participants completed the Leisure-Time Exercise Questionnaire. Weekly average Moderate to Vigorous Physical Activity (MVPA) computed. Participants completed a computerized cognitive battery: Letter Series (reasoning), N-back (working memory), Symbol Digit Modalities Test (processing speed and attention), and Number Copy task.
Multiple regressions determined whether independent effects of sleep efficiency, pain, MVPA, as well as interactive effects of sleep efficiency and pain or MVPA predicted cognitive performance, controlling for age. Sleep efficiency interacted with pain to predict letter series performance. Specifically, in individuals with highest pain (not average or lowest pain), increased SE was associated with better reasoning performance. MVPA interacted with SE to predict Number Copy task performance. Specifically, higher SE was associated with better SDMT performance at highest MVPA, but not average or lowest MVPA. In sedentary middle-aged/older adults, pain and activity moderate associations between sleep efficiency on higher and lower order cognitive tasks, respectively. Individuals with high pain may be most vulnerable to associations between lower sleep efficiency and worse reasoning. Conversely, greater activity levels are associated with stronger associations between higher sleep efficiency and better processing speed. Prospective studies needed to evaluate temporal associations between sleep, pain, physical activity and cognition.

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12: Lack of Differentiation in Item and Context Recognition Memory Ability in Young and Older Adults
Poster Session: D
Presenter: Kyle G Featherston, Washington University in St. Louis
Keywords: Episodic Memory, Context processing, Individual Differences, Associative Memory, Associative Binding
Abstract: We investigated the relation between recognition memory for items and for the context in which the items were presented. Young and older adults were asked to remember lists of names and unnamable objects, as well as the contextual information that accompanied those items, namely their size, location, or color. Following presentation of each list, recognition tests for items and context were administered. It has been proposed that the ability to remember context, or source memory, differs from memory for items themselves. In aging research, context memory tasks have been one of several groups of tasks hypothesized to decline more rapidly in older adults due to a deficit in associative binding. Confirmatory factor analyses of context memory discriminability across the entire sample suggested a single context ability. However, analyzing both item and context scores together provided no evidence of separate factors for item and context memory. Instead, the best-fitting model separated recognition performance by item type, regardless of context. Additionally, tests of measurement invariance suggested a lack of difference in the structure of these abilities in younger and older adults. These findings are consistent with the limited previous latent variable research on context memory in aging and suggest that there is no uniform context recognition memory ability separable from item memory, nor is there any difference in the structure of these latent abilities between younger and older adults.
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13: Directing Attention to Changes Improves Event Memory for Older and Younger Adults
Poster Session: D
Presenter: Sydney M Garlitch, University of North Carolina at Greensboro
Keywords: Episodic Memory, Memory Updating, Event Cognition, Attention

Abstract: People often behave according to routines and habits, but circumstances can lead to changes in behavior, such as switching your exercise to routine to accommodate new advice from your doctor. Memory for noticed event changes is facilitated when perceivers can recollect such changes and impaired when they cannot (Wahlheim & Zacks, 2019). Older adults are more susceptible to interference from such changes partly because they notice and later recollect fewer changes than younger adults. The present experiment tested whether this age difference reflected differences in attention to event features and whether this could be remediated by directing attention to those features. Participants watched two movies of an actor performing everyday activities on two fictive “days” in her life. Some activities repeated across movies, some were new in the second movie, and some included a changed feature across movies (e.g., completing a different morning exercise). Participants' attention was directed to some of the changed features in both movies using an audio-visual cueing procedure. One week later, participants attempted to recall event features from the second movie, indicated which features changed, and attempted to recall features from the first movie for events indicated as changed. Cueing changed features benefited memory for recent events for older adults. Both age groups showed improved memory for which events had earlier changed when the events were cued. These results suggest that age-related deficits in memory for event changes reflects less effective attention allocation and that this deficit may be offset by exogeneous attentional cues.

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14: Encoding-retrieval congruency affects the neural processing of associative recollection in older adults

Poster Session: D
Presenter: Courtney R Gerver, The Pennsylvania State University
Keywords: Associative Memory, Context processing

Abstract: Remembering associations has been shown to be a more difficult task than memory for individual items, particularly in older adults (e.g., the Associative Deficit Hypothesis (Naveh-Benjamin, 2000)). Research in our lab has found that congruency between encoding and retrieval modulated the associative deficit (Dennis, Overman et al., 2018). Additionally, studies using single-item or word pair stimuli have shown that even slight differences between target presentation from encoding to retrieval can have an impact on the locus of activation in hippocampus (Giovanello, Schnyer, & Verfaellie, 2009), a region critical for processing associative memory. However, it is unknown whether a change in context affects how recollected associated pairs are processed at the neural level in older adults. The current study expands prior work investigating the effect of congruency on associative recollection using complex visual stimuli (faces and scenes). Behaviorally, both young and older and older adults exhibited a benefit for recollecting associated pairs presented in a congruent visual presentation to how it was learned. Supporting this behavioral advantage for congruency, congruent compared to incongruent recollection exhibited greater activation in fronto-parietal cortices, while incongruent compared to congruent recollection elicited bilateral activity across frontal and occipital regions. While neither group exhibited differential activity in the MTL, incongruent compared to congruent recollection exhibited greater activity within right perirhinal cortex in older adults. Results suggest that regions supporting complex associative recollection in older adults differ based on the visual congruency of the retrieval cue.

Authors:
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15: Aging and Models of Cognitive Ability: Exploratory and Confirmatory Analyses of Hungarian WAIS-IV Data

Poster Session: D

Presenter: Sara Anne Goring, Claremont Graduate University

Keywords: Individual Differences, Intelligence, Latent Variable and Psychometric Network Modeling

Abstract: The positive manifold is one of the most frequently replicated findings in cognitive psychology and has often been explored using factor analysis (Spearman, 1904; Conway & Kovacs, 2013). Well-known models of cognition are typically organized such that manifest variables load onto respective latent factors representing specific cognitive abilities, and some posit a higher-order factor of general ability, g. It has been well established the cognitive abilities change across the lifespan (Craik & Salthouse, 2011), yet there is less work examining how latent models of cognitive ability compare across different age groups. The current project used data from the Hungarian-Weschler Adult Intelligence Scale-fourth addition (H-WAIS-IV; Weschler; 2008) to compare models of cognitive ability for both young (18-40 years) and older adults (65 + years). An exploratory factor analysis conducted on the young adult data (n = 457) produced a four-factor model that explained 67% of the variance in the data. This factor structure was then used to conduct a confirmatory factor analysis (CFA) on the older adult data (n = 305). The CFA produced good fit to the data, that was not significantly improved upon by adding a higher-order factor. Finally, in line with recent criticisms of using latent variable modeling (see Borsboom, Mellenbergh, & van Heerden, 2003) an exploratory psychometric network analysis was conducted on young adult data and confirmatory psychometric network analysis techniques were then applied to the older adult data, which produced similar, well-fitting results.

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16: Genes Versus Lifestyles: Exploring Beliefs About the Determinants of Cognitive Ageing

Poster Session: D

Presenter: Alan J Gow, Heriot-Watt University

Keywords: Beliefs about Aging, Cognitive Decline, Activity Engagement, Genetics

Abstract: Genetic and lifestyle factors contribute to cognitive ageing. However, the extent to which the public attribute changes in thinking skills to either genetic or lifestyle factors is largely unknown. This may be important if it impacts engagement in activities deemed beneficial to thinking skills. This study explored people’s beliefs about determinants of cognitive ageing and whether those beliefs are associated with engagement in potentially beneficial activities. A UK-wide survey for people aged 40 and over. Responses from 3,130 individuals (94.0% of the survey sample) were analysed using chi-square tests of independence. Most respondents (62.2%) believed that genes and lifestyle contribute equally to age-related changes in thinking skills. While males and females predominantly believed in an equal contribution of genes and lifestyle to thinking skills, females (66.5%) were significantly more likely than males (56.3%) to hold this belief. Males (22.1%) were more likely than females (13.6%) to believe that genetic factors were a stronger contributor. Respondents who believed genetic factors were the stronger influence were less likely to expect thinking skills might be improved or maintained with age and were
less involved with activities likely to benefit brain health. From this UK-wide survey about beliefs regarding potential determinants of cognitive ageing, some of our respondents’ views were not aligned with the findings from ageing research. It is important for the public to know how to keep their brains healthy. Our results indicate a need for clear messaging highlighting the role of lifestyle factors for brain health.

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17: A Specificity Principle of Memory: Evidence from Aging and Associative Memory
Poster Session: D
Presenter: Nathaniel R Greene, Memory and Cognitive Aging Laboratory, University of Missouri
Keywords: Associative Memory, Episodic Memory, Measurement
Abstract: The ability to remember associations among components of an event lies at the core of episodic memory, and this ability declines with normal aging (Naveh-Benjamin, 2000). In accord with the specificity principle of memory (Surprenant & Neath, 2009), this decline may occur because remembering which components were associated together requires retrieving specific information, which is vulnerable to forgetting. Guided by this principle, we endeavored to determine whether ubiquitous age-related deficits in associative memory are restricted to specific representations or extend to the gist of associations. Across two experiments, 70 young and 70 old adults studied face-scene pairs and were administered associative recognition tests following variable delays. Results, interpreted both with a multinomial processing tree model and signal detection analyses, suggest that both young and older adults could remember the gist of associations reasonably well. However, older adults were impaired in their ability to retrieve associations at more specific levels of representation. Furthermore, our results point to specificity gradient in associative episodic memory, where information can be accessed from multiple levels of specificity. On this specificity gradient, information at higher levels is more vulnerable to forgetting, especially with normal aging. These findings suggest that episodic memory may be accessed on a continuum.

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18: Predictors of Costs Associated with Cognitive Engagement in a Cognitively Impaired Sample of Older Adults
Poster Session: D
Presenter: Claire M Growney, Washington University in St. Louis
Keywords: Cognitive Impairment, Cognitive Engagement, Emotion and Affect
Abstract: The costs associated with engaging in cognitively demanding activities increase with age. The experience of such costs may be influenced by resources relating to cognitive ability, functional ability, physical health, and emotional health. The ways in which these various resources contribute to the costs of cognitive engagement for individuals with cognitive impairments have yet to be explored. In the present ongoing study, older adults (N = 23) with a wide range of level of cognitive impairment (Short Blessed M = 10.35 (SD = 3.51)) completed a difficult cognitive task while systolic blood pressure responses (SBP-R) were recorded continuously as an indicator of objective costs of engagement. We examined functional impairment (sight, hearing, and activities of daily living), cognitive impairment (short-blessed scores and laboratory assessments of cognitive ability), physical health (SF-36-physical scores and number of chronic conditions), and emotional health (SF-36-mental scores and Geriatric Depression Scores) as
predictors of cognitive engagement during the task. Preliminary analyses using linear regression reveal that emotional health was the strongest predictor of effortful cognitive engagement in this sample. Specifically, emotional health was negatively associated with linear function of SBP-R, suggesting that the costs associated with engaging in the cognitive task were lowest among those who had high levels of emotional health. Results contribute to a growing body of literature suggesting that mental health and emotional well-being are consequential for cognitive health in older adulthood, and may be particularly important for individuals with Alzheimer’s, dementia, or other cognitive impairments.

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19: A Study of Test-Retest-Retest-Retest[...] Effects Across Multiple Cognitive Domains in Middle-aged Adults

**Poster Session:** D

**Presenter:** Jonathan G Hakun, Department of Neurology, Pennsylvania State University, Center for Healthy Aging, Pennsylvania State University

**Keywords:** Cognitive Decline, Working Memory, Learning, Assessment, Methods

**Abstract:** Our ability to detect longitudinal changes in cognition can be limited by the superposition of opposing forces that subtly alter performance over time (e.g., learning, time-of-day, periodic/contextual effects). Measurement burst design studies of cognition are designed to reduce the impact of local contextual effects (e.g., good/bad day, morning/night) and ‘wash out’ retest effects through intensive repeated assessment over multiple days. Also by design, measurement burst designs operate as a form of distributed practice, allowing for explicit capture/modeling of retest effects. In the current study, we examined within- and between-day retest effects across five cognitive tasks in a measurement burst design, ambulatory cognitive assessment study. Prior to randomization into a health behavior intervention, middle-aged participants carried study-provided smart phones loaded with mobile monitoring of cognitive change (“M2C2”) software for a period of 7 days. Participants were notified to complete 5 assessments per day that each included 5 ultra-brief measures of processing speed, associative long-term memory, associative visual working memory, executive attention, and visuospatial working memory. Retest effects including within- and between-day improvements/decrements in performance were evaluated in a multi-level modeling framework. Time-of-day effects were observed across three domains (worsening of performance throughout the day). Within-day effects were superimposed upon positive performance trajectories (i.e., week-long retest gains) for four of the tasks. In contrast, declines in associative long-term memory performance were observed over the week, perhaps indicating the build-up of proactive interference. Results will be discussed in context of extant models of learning and memory.

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20: Older and Younger Adults Effectively Reappraise in Different Ways

**Poster Session:** D
**Presenter:** Lucas J Hamilton, Cleveland State University  
**Keywords:** Emotion and Affect, Autobiographical Memory, Reappraisal, Psychophysics  
**Abstract:** Past studies have been equivocal regarding age differences in reappraisal efficacy. The present study examined age-related differences in reappraisal effectiveness in response to negative autobiographical events. Forty-nine younger adults and 47 older adults generated 50 negative memories and came back to a subsequent study session one to two weeks later to undergo a reappraisal task. Participants implemented one of three instructions for 30 seconds: remember naturally, increase negative reactions, or decrease negative reactions via a “positivizing” tactic. Each instruction was provided for 10 unique memories with negativity, positivity, and vividness ratings collected after each trial. A series of 2 (Age; YA, OA) × 3 (Instruction; Remember, Increase, Decrease) mixed ANOVAs uncovered no age differences in negativity or vividness ratings during the memory generation phase. However, older adults rated all memories more positively than younger adults. This age difference persisted during the reappraisal task; however, older adults rated all memories more negatively and vividly than younger adults. Multilevel analyses revealed significant variability in the time-course of pupillary responses. Specifically, reappraisal brought about faster and more frequent spikes in pupil diameter namely for older adults. We conclude that older and younger adults may achieve reappraisal success in different ways. Contrary to strict hedonic orientations, older adults may simultaneously maintain heightened negativity and positivity during reappraisal, which challenges existing propositions regarding age-related prioritization of hedonic goals.  
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21: Cross-hemispheric Connectivity Benefits Cognition in Normal Aging  
**Presenter:** Mariam Hovhannisyan, Duke University  
**Keywords:** Episodic Memory, Neuroscience: Structural, Alzheimer’s Disease, Cognitive Impairment, Diffusion Tensor Imaging  
**Abstract:** The left and right cerebral hemispheres collaborate to complete complex cognitive tasks, which healthy older adults often take advantage of to offset the deleterious effects of aging on cognition. Bilateral patterns of fMRI and EEG activity are associated with increases in memory and attention, suggesting a compensatory mechanism. Nonetheless, little is known about the specific role these kinds of connections play in cognition and their increasingly important role as we age. Here, we use neuroimaging and neurophysiology to assess whether bilateral transcranial magnetic stimulation (TMS) delivered online to prefrontal cortex (PFC) maintain a strong role in measures of fluid intelligence. We related bilateral brain connectivity during a resting state and episodic memory task, as measured by both structural (based on diffusion weighted imaging) with functional connectivity (phase coherence between homotopic, bilateral regions as measured by EEG). We also collected an extensive neuropsych battery on all 22 older adults subjects. We found a strong, selective relationship between structural connections in bilateral prefrontal regions and scores of working memory, a relationship which remained after accounting for individuals’ age. We also assessed both the neurophysiological correlates of unilateral and bilateral TMS during the resting state task, and found that bilateral alpha stimulation increased bilateral PFC alpha power. Critically, during the memory task bilateral alpha TMS was related to worse performance in the memory task. Our experiment helps to confirm the hypothesis that bilateral connectivity patterns help mediate cognition in older adults, and suggests specific neurophysiological correlates of this effect.  
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22: Age Differences in Cognitive Effort Depends on Perceived Task Difficulty

**Poster Session: D**

**Presenter:** MacKenzie L Hughes, Georgia Institute of Technology  
**Keywords:** Physiological Arousal, Cognition, Effort, Activity Engagement

**Abstract:** This project examined age differences in effort to complete cognitively demanding tasks. Fifty-two younger adults (M age=21.2) and 56 older adults (M age=76.4) completed a series of cognitive tests. The amount of effort required to complete each test was operationalized by measuring systolic blood pressure responses (SBP-R) immediately following completion of each test. Participants also rated the test difficulty after completing each test. Multilevel models were used to examine the relationship between perceived test difficulty and effort with performance and health as covariates. There were no main effects of health, cognitive performance or trial subjective difficulty on SBP-R. However, there was an Age Group X Difficulty interaction. For younger adults, none of the variables (health, cognitive performance, perceived difficulty) were significant predictors of SBP-R. However, for older adults health and cognitive performance had a significant positive relationship with SBP-R and perceived difficulty had a significant negative relationship with SBP-R. This suggests that the older participants did not expend as much effort towards completing the cognitive tests they perceived as difficult, illustrated by their decreased SBP-R following the tests they rated as high difficulty compared to low difficulty. Findings provide support for Selective Engagement Theory (Hess, 2014) and highlight potential age differences in effort expenditure and motivation. Costs (i.e., amount of effort required to successfully complete cognitive tasks) may influence levels of motivation to engage in the tasks, particularly for older adults.

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23: A study on emotion regulation of Korea adults inferred from the performances in the Ultimatum Game

**Poster Session: D**

**Presenter:** Ahjeong Hur, Department of Psychology, Chungbuk National University, Korea  
**Keywords:** Decision making, Cognitive Control, Emotion and Affect, Positivity Effect

**Abstract:** The purpose of this study was to investigate whether older adults could regulate negative emotions better than young adults in decision making situation. In an ultimatum game, if the proposer proposes to distribute a portion of the money to the responder, the responder must decide whether to accept or reject it. If the responder accepts the offer, the proposer and the responder can each have their own share as proposed, but if s/he reject the offer, both get nothing. Thus, if the responder considers own economic benefits, it is a more reasonable decision to accept the unfair offer no matter how low, than to reject it. To accept an unfair that proposes only a small share to the responder, the responder must regulate the anger felt at the proposer. If older adults could regulate anger better than young adults, they would be less likely to reject the unfair offer than young adults. Fifty-five older adults and 60 university students participated. Both the older and young adults accepted most of the fair offers. In contrast, older adults accepted more unfair offers than young adults (69.7% vs. 34.0%). In addition, compared to young adults, older adults reported anger less frequently at the unfair offers. Emotion regulation assessed by ERQ (Gross & John, 2003) mediated the relationship between the age groups and acceptance rates of
unfair offers. The present results demonstrated that older adults accepted more unfair offers than young adults because they could regulate their negative emotions better than young adults.

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**24: Cognitive Aging with the Neurobehavioural and Psychiatric Sequelae of Brain Injury**
**Poster Session:** D
**Presenter:** Daniel Andre Ignacio, St. Jude's Brain Injury Network, Fielding Graduate University
**Keywords:** Cognitive Decline, Cognitive Impairment, Memory, Assessment, Emotion and Affect
**Abstract:** The neurocognitive status of adults with head injury is suggested to resemble cognitive profiles of poor memory and attention, which are characteristic deficits in aging adults who would otherwise be considered neurotypical. Specifically, traumatic brain injury (TBI) could accelerate cognitive decline in normal aging due to decreases in cognitive reserve. Cognitive decline may also be caused from psychiatric symptoms. However, research suggests that cognition, specifically executive functions, can be impacted by the interaction of both of these neurogenic and psychogenic causes, rather than by any one factor alone. To investigate this notion over time, a 12-week cognitive rehabilitation program was designed and offered to 29 survivors of TBI whose ages ranged from 21 to 83 years. The program consisted of participants attending weekly classes where they were taught strategies to recognize and improve their cognitive functioning to strengthen post-injury deficits. Pre and post data were collected on their neuropsychological status along with a 22-point symptom scale from the Acute Concussion Evaluation. Affective (i.e., depression, anxiety, and stress) and cognitive self-reported symptoms were also collected each week for three months. The neuropsychological data from participating survivors was compared to the normative sample from the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) after controlling for age, which was assessed both as chronological age and the amount of time that has elapsed since the TBI. Regression slopes were assessed to compare how neurogenic and psychogenic contributions of cognitive deficit alter the rate of change throughout the life with and without TBI.

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**25: Age Differences in navigation and Item Recognition on Hierarchical Menu: Effects of Contents Familiarity**
**Poster Session:** D
**Presenter:** Kanau Ishii, University of Tsukuba
**Keywords:** Memory, Cognitive Control, Executive Function
**Abstract:** User interface in many information devices has hierarchical menu which is advantageous to present many functions in a limited space. However, hierarchical menu can cause confusion and disorientation especially in older adults. This study examined the usability of hierarchical menu, conducting four tasks in an experiment and clarified whether the performance differs as a function of age group and contents familiarity, getting older adults (N = 13) and younger adults (N = 12) participated. In the information searching task, participants had to find target items operating two different menu
systems; an information display for a hybrid car (as LOW contents familiarity) and a touch screen menu of a restaurant menu (as HIGH contents familiarity). After the information searching task, explanation task, the card sorting task, and the recognition tests on both menu systems were conducted. In the recognition test, 8 items were presented, five of them were old items displayed throughout information searching tasks, however, not directly related to the task. The results revealed that when contents familiarity was LOW, both age groups spent more time on searching targets and showed more correct memory for task-irrelevant information on display. Those tendencies were more prominent in older adults. Findings suggest that both age groups distributed broader attention to find desired information when menu contents were unfamiliar, while older adults had additional difficulty in inhibiting processing task-irrelevant information, maybe due to cognitive aging. This implies contents familiarity is a crucial factor that influences the usability of hierarchical menus, especially for older adults.

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26: Depression and Episodic Memory Across the Adult Lifespan: A Meta-Analysis
Poster Session: D
Presenter: Taylor James, Georgia Institute of Technology
Keywords: Episodic Memory, Depression, Meta-Analysis
Abstract: Episodic memory deficits have been reported in depressed individuals across the lifespan, however, it is unclear how robust the effect is. To date, no systematic investigation has explored this question. Measures of episodic memory were examined in 65 studies (a total of 23,082 participants), which yielded 189 effect sizes. Using 3-level meta-analysis (metaSEM package for R), we found that depressed participants scored on average 0.48 SD (95% CI from -0.58 to -0.37) below control participants. No significant effects were found for recall versus recognition, immediate versus delayed recall, free versus cued recall, or verbal versus nonverbal material, suggesting a relatively general memory deficit in depressed individuals. Emotional valence of the stimuli yielded significant effects: positive stimuli yielded larger differences between depressed and non-depressed participants (average g = -1.18; 95% CI = -1.50 to -0.86) than neutral stimuli (average g = -0.48; 95% CI = -0.59 to -0.36), which in turn yielded smaller differences than negative stimuli (average g = 0.17; 95% CI = -0.13 to 0.46), suggesting strong mood-congruency effects. Diagnostic status (i.e., whether participants in the depressed group had received a formal diagnosis) or depression status (current versus remitted) had no significant effect. Age had a curvilinear, mirrored J-shaped effect, with small depression effects in young adulthood (predicted g = -0.07 at age 20), peak effects in middle age (predicted g = -0.66 at age 55), and more modest effects in old age (predicted g = -0.31 at age 80).
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27: The PAC Test: A Novel Method for Testing the Binding of Features in Episodic Memory
Poster Session: D
Presenter: Alan W Kersten, Florida Atlantic University
Keywords: Associative Memory, Episodic Memory, Event Cognition
Abstract: Although episodic memory has traditionally been examined using static stimuli, such as words or pictures, a more ecologically valid approach would appear to involve studying memory for events. Kersten et al. (2018) have developed a novel method for testing event memory called the Person-Action
Conjunction (PAC) Test. In this test, participants view actions performed by various actors and are later tested on their recognition memory for the actions. The key test items are the conjunction items, involving a familiar person performing an action that had previously been performed by someone else. Healthy older adults are more likely than young adults to falsely recognize these conjunction items, even after controlling for memory for the actors and actions in isolation, suggesting that older adults encode individual features but have difficulty binding them together in memory. Here we present a new set of video stimuli that will be accessible to researchers who wish to employ the PAC Test in their research. Within this set of 1152 videos, half involve actors performing simple actions such as waving a flag or dropping a pencil, whereas half involve those same actors speaking corresponding action phrases, allowing one to compare memory for which person performed each action to source memory for verbal material. Furthermore, half of the videos involve two actors performing the 144 actions or phrases, whereas half involve 144 different actors performing those actions and phrases, allowing one to examine effects of variability in source information on memory for the sources of actions and phrases.

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28: Should I keep studying? Consequences of a decision to stop learning in young and older adults

Poster Session: D
Presenter: Aleksandra Krogulska, Warwick University
Keywords: Memory, Metacognition, Learning
Abstract: Often the amount of information we have to remember exceeds our memory capability, which may be especially challenging for people in late adulthood. We investigated how young and older adults decide to stop receiving new information during learning as a strategy for maximizing memory performance. In Experiment 1, participants studied three lists of 50 words. In the control condition, to-be-remembered materials were presented in their entirety, whereas in the experimental condition, participants could stop the presentation of words before the end. A comparably high number of young and older adults decided to stop the presentation. This decision, counterintuitively, led to a decrease in the number of recalled words. Importantly, young and older adults chose a similar learning strategy: they stopped the presentation of to-be-remembered material at a similar point and suffered comparable consequences as reflected in their memory performance. In Experiment 2, participants read only the description of the task and then decided what they would do in a comparable situation. Even though numerically older than young adults declared that they would have chosen to stop learning, the point at which they said they would do so was similar across age groups, and comparable to that observed in Experiment 1. Importantly, participants’ forecasted performance did not reflect the negative influence of this decision. Regardless of their age, people made a suboptimal decision to stop learning with little awareness of its negative consequences.

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29: Aging and Source Memory: Does Source Reinstatement Facilitate Source Retrieval for Older Adults?

**Poster Session:** D  
**Presenter:** Beatrice G Kuhlmann, University of Mannheim  
**Keywords:** Episodic Memory  
**Abstract:** Older adults show much more pronounced deficits in source memory (e.g., remembering who said something) than in item memory (e.g., remembering what was said). However, it is unclear whether this deficit stems from difficulties with source storage or with retrieval of source details stored in memory. In a standard source-monitoring test, source memory is tested within an item-recognition test in which items are presented in a source-neutral manner (e.g., a word previously spoken by Source A is presented in print). Thus, this test requires self-initiated retrieval of source details (e.g., voice features). In the current study, we extended this standard test by a second source-recognition test employing reinstatement of the item in the original study source to assess source storage. Younger participants (18-30 years) consistently benefitted from source reinstatement yielding higher source memory in the second compared to the first test. Repetition of item-source pairs at study only improved younger adults’ source storage, but not retrieval. In contrast, in older participants (61-89 years), repetition at study improved both source storage and retrieval. Whereas older adults’ source retrieval was fully intact for strongly encoded sources (repeated at study), they had pronounced difficulties with retrieving weakly encoded (no repetition at study) source. Independent of repetition at study, age differences persisted in the source-recognition test, evidencing a robust age-related deficit in source storage.  
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30: Effect of proactive interference in associative memory in aging

**Poster Session:** D  
**Presenter:** Kyoungeun Lee, Georgia Institute of Technology, School of Psychology  
**Keywords:** Memory, Associative Memory, Proactive Interference  
**Abstract:** Several studies have reported that older adults have larger susceptibility to proactive interference (PI) compared to young adults. However, most of the previous studies focused on the working memory domain. Here, we investigated associative memory performance under different levels of PI to determine whether age-related increases in PI susceptibility contribute to older adults’ associative memory impairment. Young and older adults completed an associative memory task in which objects were paired repeatedly with either faces or scenes. Participants were asked to remember the most recent pairing for each object and the level of PI was manipulated by increasing the number of presentations for the other, least recent, face or scene. Subjects were asked to decide whether a face or scene was most recently paired with the object and in a second step, the specific face or scene. Across age, PI effects were shown in both memory accuracy and in reaction times. Interestingly, older adults showed greater susceptibility to PI in their accuracy estimates for the general (face vs. scene) but not specific associative memory decision, the latter of which was generally reduced by age. In conclusion, older adults experience more difficulty than young adults in resolving proactive interference during new associative learning.  
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31: Examining the effectiveness of unitization strategy on reducing age-related associative memory deficit

**Poster Session:** D

**Presenter:** Lingqian Li, Ryerson University

**Keywords:** Associative Memory, Strategy Use, Associative Binding, Memory

**Abstract:** Age-related associative memory deficit has been well documented (Old & Naveh-Benjamin, 2008). Past research demonstrated that associative memory is based on both recollection (i.e., context-specific details) and familiarity (i.e., general feeling of knowing), with the former tends to decline whereas the latter remains intact in older adults. Recent studies (e.g., Park & Yonelinas, 2015) demonstrated that unitization strategy – using mnemonics that synthesizes two unrelated objects into a single entity which represents characteristics of both – could improve young adults’ associative memory performance by promoting familiarity-based retrieval. The current study aimed to examine whether this unitization strategy could be used to promote familiarity in older adults which in turn improve their associative memory performance. Thirty-six young (age range 17-27) and 36 older adults (age range 65-89) participated in this study. Participants in each age group were randomly assigned to study a list of word pairs under unitization strategy (e.g., “RABBIT COFFEE is a beverage that makes one jumpy”) or under sentence framing strategy (e.g., “The quick brown RABBIT jumped over the COFFEE jar”), that involves less unitization. This was followed by item memory and pair association recognition tasks, both based on a remember/know/new recognition paradigm. Results showed that both young and older adults showed increased familiarity in the unitization relative to the sentence framing condition. However, older adults did not show improvement in associative memory in the unitization relative to the sentence framing condition. The results are discussed in light of the schematic support embedded in memory strategies developed for older adults.

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32: Visual Contrast Sensitivity is Associated with Non-Amnestic Mild Cognitive Impairment During Late Middle Age

**Poster Session:** D

**Presenter:** Michael J Lyons, Boston University

**Keywords:** Cognitive Decline, Visuo-Spatial Abilities

**Abstract:** Aging affects sensory, as well as cognitive functioning. The nature of their relationship has important implications for understanding the aging process. Visual contrast sensitivity (CS) is a measure of the ability to distinguish an object from its background. Age-related reductions in CS have been attributed to both structural ophthalmic changes and changes in the central nervous system. Participants were drawn from the Vietnam Era Twin Study of Aging. At the first wave (mean age = 56 + 2.5) of data collection 1,237 participants were included; 1,016 were included in the second wave (mean age 62 +2.6). Michelson contrast scores were aggregated into low mean (1.5-3.0 cpd), middle (6.0 cpd), and high mean (12.0-18.0 cpd) spatial frequencies. Higher Michelson contrast scores indicate better CS. Mild Cognitive Impairment (MCI) was defined by an extensive battery of neuropsychological tests. Participants were classified as cognitively normal, amnestic MCI, or non-amnestic MCI. During wave 1 (mean age 56) there was no association between CS at any spatial frequency and amnestic and non-amnestic MCI. However, during wave 2 significant associations were observed between all three spatial frequencies and non-amnestic MCI. Direct cause theories about the relationship between sensory and cognitive functioning, such as the sensory deprivation model and the sensory degradation model, predict that the relationship between sensory and cognitive functioning will strengthen with age. Thus, the change that we observed
in the relationship of CS to non-amnestic MCI from average age 56 to average age 62 is consistent with the direct cause theories.

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### 33: Relationships Between Memory and Flexibility Performances in Virtual Morris Water Maze and NIH Toolbox Cognitive Battery

**Poster Session: D**

**Presenter:** Kathy R Magnusson, Oregon State University

**Keywords:** Cognitive Decline, Spatial Memory, Executive Function, Working Memory, Visuo-Spatial Abilities

**Abstract:** This study examined the relationships between cognitive functions tested in virtual Morris water maze (vMWM) tasks and NIH Toolbox Cognitive Battery across aging. Younger (18–31 years; N=3–8) and older (60–86 years; N=9–18) male and female human participants performed Logical Memory task (WMS IV), NIH Toolbox Cognitive Battery, and cognitive tasks in a vMWM, including long-term memory, reversal, working memory and visible control trials, while seated at a computer desk. In the long-term memory task, participants had no information that the platform would remain stationary during the first 12 hidden platform trials. They were then informed that the platform would remain stationary and performed an additional 12 trials. For reversal trials, the platform was moved to the opposite quadrant and they were informed that it had moved. For working memory trials, they were informed that the platform would move after every two trials. After locating a new position (naive trial), they searched again within 15 seconds (immediate trial).

Hidden trials, after being informed about platform stability, correlated with flanker inhibitory control, list sorting, picture sequence memory, and fluid cognition composite scores (R=−.51−.65; p<.001). Average probe trials correlated with Logical Memory immediate recall (R=−.53; p=.0006). Reversal trials showed a relationship to Logical Memory recall after 50 minutes (R=−.518; p<.001) and averaged long-term memory hidden and probe trials (R=.53−.67; p<.0006). The immediate working memory trials correlated with list sorting, flanker inhibitory control, pattern completion and fluid cognition composite scores (R=−.56−.74; p<.0003). This suggests that the vMWM tasks are relevant for memory testing.

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### 34: Age-Related Differences in the Granularity of Activation of Emotion Concepts

**Poster Session: D**

**Presenter:** Andrew Mienaltowski, Western Kentucky University, Department of Psychological Sciences

**Keywords:** Lexical Retrieval, Emotion and Affect, Positivity Effect

**Abstract:** Aging is associated with a limited future-time orientation and a tendency to focus on positive over negative emotion in one’s environment. This shift in focus can lead to noticeably different patterns
of lexical activation. This study used a lexical decision task after priming younger and older adults with emotionally evocative experiences to investigate the granularity of activation of discrete emotion concepts. Participants wrote a brief narrative about their (neutral) morning routine or about the last time they were angry or disgusted. For neutral priming, evidence of a positivity effect was expected from older adults’ response times to emotion words, whereas a negativity bias was expected for younger adults. These predictions were supported by older adults’ response times but not by those of younger adults. After controlling for chronological age, older adults anticipating more years remaining in life responded faster to positive words than those anticipating fewer years left. Relative to younger adults, older adults were expected to display less granularity in the activation of negative emotion concepts in response to emotion priming. This prediction was not supported. Older adults displayed as much granularity as younger adults. The more intense the emotion experienced by older adults during the priming task, the faster their response times were to the target emotion concept items. These findings suggest that older adults’ positivity in lexical decision responses may emerge because they anticipate enjoying many more years of adulthood, and that emotion primes elicit granular activation of older adults’ emotion concepts.

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35: Stress, resilience and prospective memory in older age: what is the relation?
Poster Session: D
Presenter: Greta Mikneviciute, University of Geneva
Keywords: Stress, Prospective Memory, Predictors, Emotion and Affect, Methods
Abstract: Recently, perceived stress gained attention as a potential modulating factor for cognitive functioning in older age. Memory tests that require a greater amount of executive resources and more integrated and elaborative processing seem to be particularly concerned. Although prospective memory (PM) falls into this category, its association with perceived stress in older age has received little to no attention. Thus, we aimed at understanding how stress, in particular its different dimensions “self-efficacy” and “helplessness”, as well as the related construct daily hassles, affect PM performance in older adults. In addition, we were interested in the question whether dispositional resilience mediates this relationship.

994 older adults from the Swiss Aging survey Vivre-Leben-Vivere were administered the perceived stress scale (PSS-4), the daily hassles scale, a dispositional resilience scale and four event-based PM tasks. Confirmatory factor analyses were used to establish the underlying measurement models and structural equations modeling to analyze the relationship between these constructs. The results indicate that the PSS subscale “self-efficacy”, but not the subscale “helplessness”, positively predicted PM performance in older adults. Moreover, resilience partially mediated this relationship. Daily hassles, however, were not associated to PM performance by any means. These findings suggest that different aspects of stress do not equally relate to cognitive performance in older age. More precisely, higher perceived self-efficacy and resilience seem to be particularly important for better cognitive functioning in older adults.

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36: The reversion of information processing between episodic learning and retrieval across the adult lifespan.

**Poster Session:** D  
**Presenter:** Soroush Mirjalili, Georgia Institute of Technology  
**Keywords:** Context processing, Episodic Memory, Attention  
**Abstract:** Memory theories suggest that reconstruction of prior encoding experiences supports successful episodic memory, and that the temporal dynamics of episodic reconstruction are reversed to those of encoding. However, it is unclear exactly how age affects these dynamics and whether any age-related changes contribute to age-related episodic memory impairment. We designed a context memory task in which subjects encoded objects along with scene and color context features, one of which was to be ignored, to assess the hypothesis that low-level perceptual (color) features are encoded prior to high-level (scene) features, while high-level features are reconstructed prior to low-level ones during retrieval. To be more specific, we performed multivariate decoding analyses to investigate the time at which successfully remembered context features are most discriminable from forgotten contexts at both encoding and retrieval. We found that during encoding, low-level features were encoded earlier than high-level features while the opposite was found during retrieval, across age. However, the temporal dynamics were affected by attention, such that low-level context features were encoded earlier when they were attended and retrieved later when they were ignored (not attended). Importantly, age reduced the sensitivity of these temporal dynamics to top-down attention, consistent with an age-related difficulty using cognitive control to control episodic encoding and reconstruction. Collectively, these results suggest that while the reversion of information processing between encoding and retrieval is largely preserved with age, the ability to use top-down attentional control to impact these dynamics is not, which in turn contributes to worse memory performance.

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37: The Influence of Familiarity on Event Segmentation across Age

**Poster Session:** D  
**Presenter:** Kimberly Newberry, Kansas State University  
**Keywords:** Knowledge, Working Memory, Episodic Memory, Everyday Memory, Semantic Memory  
**Abstract:** The ability to parse ongoing activity into discrete events and later remember them declines with age, which is likely due to changes in working memory. However, semantic knowledge improves with age and may be used as a resource to improve these processes (Umanath & Marsh, 2014). One way in which we parse activity information is by engaging in event segmentation. Event Segmentation Theory (Zacks et al., 2007) provides a framework for understanding segmentation and suggests a role for semantic knowledge. Across 3 studies, we investigated the influence of knowledge on event segmentation for everyday activities, between older and younger adults. Knowledge was manipulated by varying the familiarity of activities based on the generation of normative scripts (Rosen et al., 2003), such that older adults were more familiar with some activities and young adults were more familiar with others. All participants watched and segmented the videos. Familiarity significantly interacted with age to predict segmentation. This result suggests that older and younger adults segment better when they have prior knowledge for an activity. Prior work has found that better segmentation ability is associated with better memory, so future directions will explore relationships between familiarity, age, segmentation, and memory. Altogether, this work suggests prior knowledge may help older adults encode information more effectively, which may have implications for learning interventions.

**Authors:**
38: Effects of music on executive function and positivity effect in older adults

**Poster Session:** D

**Presenter:** Noiret Nicolas, UMR-CNRS 7295, Research centre on Cognition and Learning (CeRCA), University of Poitiers and Tours

**Keywords:** Emotion and Affect, Executive Function, Music, Positivity Effect

**Abstract:** Although several studies have suggested that positive affect (PA) modulates cognitive and emotional processing in younger adults (YA), only few studies have investigated effects of PA in older adults (OA). To delineate age-related modulatory effects of PA on executive functioning and emotional processing, the current study examined whether PA increases performances on inhibition (i.e. stop-signal task), flexibility (i.e. categorical switching task), updating (i.e. letter-memory task) and attention to emotional faces (i.e. dot probe task) in YA (N=20) and OA (N=20). Participants took tasks one time after listening positive music (positive affect condition, PAC) and another time without listening music (“neutral” affect condition, NAC). We found a main effect of age on executive tasks. Our results also showed that participants made fewer errors in letter-memory task in PAC than in NAC. Moreover, only OA were faster in responding, and made few errors, in stop-signal task in PAC than in NAC. As regards emotional dot probe task, OA displayed attentional bias toward positive faces and away from negative faces only in NAC, whereas YA exhibited an attentional bias toward negative faces only in PAC. These results are in line with the idea that enhanced performance in PAC could be related to increased dopaminergic neurotransmission and better cognitive control. Indeed, these preliminary results suggest that PA can improve executive functioning in terms of inhibition and updating (although not flexibility). Moreover, PA seems to reduce positive bias in OA and increase negative bias in YA, suggesting a better ability to deal with emotional stimuli.

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39: Exploring the Effects of Aging and Emotional Distraction on the Mere Exposure Effect

**Poster Session:** D

**Presenter:** Alison M O'Connor, Brock University

**Keywords:** Emotion and Affect, Mere Exposure, Distraction

**Abstract:** Humans tend to prefer things that are familiar, and this phenomenon has been termed the ‘mere exposure effect’ (Zajonc, 1968). While this effect is well-documented in young adults, few studies have explored how aging and distraction affect mere exposure. As older adults are more prone to distraction (Rowe et al., 2006) and show a greater attentional bias towards positive information (Mather & Carstensen, 2005), the effect of distraction on mere exposure may differ with age depending on the valence of that distraction. The present study examined the effect of emotional distracting words on younger and older adults’ liking ratings of previously viewed faces. In two experiments, young and older adults (n = 33 per group) performed a 1-back task on pictures of faces while ignoring neutral and emotional distracting words superimposed on the faces (Experiment 1: negative words; Experiment 2: positive words). Participants subsequently rated the likeability of faces that were either new or previously paired with neutral or emotional words. Both young and older adults liked neutral-paired faces more than new faces. Moreover, the mere exposure effect persisted when participants were distracted by positive
words, but not negative words. These results suggest that the mere exposure effect is preserved with age and disrupted by negative distraction. Future work should explore mere exposure for faces as a potential means of intervention (e.g., priming older adults with faces of people that they will interact with in a new care facility).

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40: Perceived facial trustworthiness in older men is modulated by chronic intranasal oxytocin administration

**Poster Session: D**

**Presenter:** Didem Pehlivanoglu, University of Florida

**Keywords:** Oxytocin, Emotion and Affect, Decision making, Attention, Applied Cognition

**Abstract:** The neuropeptide oxytocin (OT) modulates perceptions of trust, possibly enhancing perceived facial trustworthiness among young adults (Theodoridou et al., 2009). The mechanisms underlying these effects and whether they apply to older individuals (Grainger et al., 2019), however, are currently not well understood. Furthermore, previous research on this topic has exclusively relied on single-dose OT administration and chronic intranasal OT administration as a possible treatment approach has not been explored yet. We examined the effects of chronic intranasal OT administration on perceived facial trustworthiness among older men. Employing a double-blind randomized between-subjects design, participants self-administered either OT (24 IU) or placebo twice-a-day over four weeks via intranasal spray. Pre- and post-intervention, participants rated the trustworthiness of faces varying in age, expression, gender, and eye gaze (FACES database; Ebner et al., 2010) while eye-tracking data were recorded. The treatment groups did not differ in trustworthiness ratings pre-intervention. At post-intervention, however, older men in the OT group compared to older men in the placebo group rated faces with direct eye gaze as more trustworthy than faces with averted eye gaze; this effect was more pronounced for young than older faces. Preliminary analyses of the eye-tracking data furthermore showed that this OT effect was accompanied by increased pupil dilation to young compared to older faces with direct eye gaze. These results suggest OT enhances attention toward facial cues with high social salience in older men, consistent with the social salience (Shamay-Tsoory and et al., 2009) and the prosocial (Meyer-Lindenberg, 2008) hypotheses of OT.

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41: Mood effect on recall and subjective organization strategy in young and older adults

**Poster Session:** D  
**Presenter:** FLORENT FP PINARD, Université de Tours, UMR-CNRS 7295 CeRCA  
**Keywords:** Episodic Memory, Aging, Mood, Recall, Subjective Organization  
**Abstract:** Mood is defined as a permanent emotional state resulting from the regulation of positive and negative affects. According to the theory of socio-affective selectivity, the regulation of emotions would be different according to age. Older adults would regulate their emotions by decreasing the impact of negative emotions on their mood (Guillaume et al., 2009). According to Ashby et al. (2002), performances in cognitive tasks are influenced by positive affects. We test the hypothesis that positive mood modulates episodic memory performance in older adults.

Young and old adults completed a Mood test (BMIS) and learned a list of 20 non-organizable words to be recalled in 3 successive trials. A subjective organization index (PF), based on the number of common pairs from one trial to the next was calculated. Contrasting groups were formed from BMIS scores (Mood + and Mood -).

ANOVA Age x Mood on recall and organization index confirmed the classic effects of Age. The interaction between the two factors indicated that age-related difference was reduced for older participants of Mood + (recall and organization). Regression analyzes showed that Mood is the first predictor of these performances for the older group, while organization was the best predictor of the recall score in young adults.

Regulation of emotions related to a negative mood would tap on the older adults’ reduced cognitive resources, while positive mood would optimize the use of available resources, reducing the effects of aging on recall performance and organization strategy.

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42: fMRI investigation of the association between glucose tolerance and N-back performance in older adults

**Poster Session:** D  
**Presenter:** Ursula Saelzler, Georgia Institute of Technology  
**Keywords:** Neuroimaging: Functional, Working Memory, Illness and Chronic Disease, Prediabetes  
**Abstract:** Prediabetes, a condition intermediate between normal glucose tolerance and diabetes, has been related to worse cognition in older adults. This study used a surface-based fMRI analysis to examine the relationship between measures of glucose tolerance and the neural correlates of the N-back task in older adults. Participants (mean age = 70.3; n = 26) completed an N-back task during scanning within approximately one week of a 2-hour oral glucose tolerance test (OGTT) from which OGTT indices of glucose tolerance, including measures of insulin sensitivity and insulin secretion, were derived. Imaging analyses were conducted using AFNI and revealed the anticipated frontal and parietal activations when contrasting the 0- and 2-back conditions, as well as correlations between OGTT indices and frontal and/or parietal activity. OGTT indices did not correlate with behavioral performance on the N-back tasks. Findings support the notion that variations in glucose tolerance prior to the onset of diabetes may affect brain
function, stressing the importance of early detection and possible early modulation of prediabetes in older adulthood.

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43: Under the skin: Alzheimer patients and their physiological arousal during reminiscence sessions

Poster Session: D
Presenter: Sinué Salgado, Aarhus University, Center on Autobiographical Memory Research
Keywords: Autobiographical Memory, Arousal, Alzheimer's Disease, Emotion and Affect, Dementia
Abstract: Autobiographical memory (AM) refers to the recollection of personal events in one’s own life. Research has demonstrated that AM plays a fundamental role in psychological well-being. However, AM is impaired early in the course of Alzheimer’s disease (AD). The present study pursues the hypothesis that it is possible to improve well-being in individuals with AD by stimulating autobiographical remembering through environmental cuing. The study draws upon well-established findings of early memories (from childhood and young adulthood) being better preserved and more easily remembered than recent events in AD. It also draws upon recent findings showing that involuntary (spontaneously arising) autobiographical remembering is a way of accessing the personal past that requires little executive control and that therefore may circumvent the executive deficits in memory retrieval seen in AD. We examine the effects of immersion into a historically authentic 1950s museum environment that reconstructs the material and cultural context of the participants’ youth compared with a modern 2010s environment. A total of 32 older adults diagnosed with AD participated in semi-structured memory conversations in the 1950s versus 2010s environment. We examined how physiological markers of distress and arousal, and coding of positive effect vary as Alzheimer patients reminisce of their life in these different settings. The findings showed increased levels of arousal and positive affect in the 1950s setting compared with the modern setting. Our results suggest that patients benefited from sensory rich and specific recognizable cues from the museum-setting, which influenced their mood and arousal level positively.

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44: Can You Imagine Your Way to Fewer Errors? A Test of the Generalizability of a Strategy

Poster Session: D
Presenter: Emily Streeper, Washington University in St. Louis
Keywords: Prospective Memory, Strategy Use, Cognitive Control
Abstract: Prospective memory (PM) commission errors refer to the erroneous repetition of a no-longer-relevant intention. PM commission errors can have dangerous consequences, and older adults appear to be at increased risk of such errors. Recent research has investigated ways to reduce commission error risk for older adults using the commission error task (Bugg, Scullin, & Rauvola, 2016). Initial evidence indicates that a novel strategy called imagined forgetting practice (IFP) reduces commission error risk for older adults (Streeper, Yang, & Bugg, under review). IFP guides participants to imagine encountering no-longer-relevant target words, feeling the urge to perform the PM intention, and withholding the response. The current study examined two questions: (1) can the IFP strategy improve performance in another task that
involves similar cognitive mechanisms (go/no-go task), and (2) is the IFP strategy transferable from one task (go/no-go) to another (PM commission error task) when learned in the context of only one task? We hypothesized that younger and older adults provided with the IFP strategy would make fewer errors on no-go trials relative to participants who were not provided with a strategy. In addition, if the strategy is transferrable, we expected PM commission error risk to be lower. The benefit of the strategy for no-go performance was limited and did not decrease PM commission error risk. Surprisingly, PM commission error risk for both age groups was exceptionally low compared to previous research, suggesting that performing an inhibitory task before the commission error task may have reduced PM commission error risk.

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45: The interaction of extrinsic and intrinsic motivation on long-term memory in younger and older adults
Poster Session: D
Presenter: Liyana T Swirsky, Ryerson University
Keywords: Memory, Motivation
Abstract: Curiosity – a variant of intrinsic motivation – enhances memory in younger and older adults, as do financial rewards and other extrinsic incentives. Research with younger adults suggests that intrinsic and extrinsic motivation may have interactive rather than additive effects. One study showed that money boosted memory for uninteresting material, but not for interesting material (Murayama & Kuhbandner, 2011). How aging affects the interaction of intrinsic and extrinsic motivation on information processing has received little study to date. In light of theorized shifts in motivational priorities with age, we hypothesized that the effects of curiosity on memory would be less sensitive to the presence of financial reward in older adults, compared with younger adults. We also examined whether the effects of curiosity would be limited to curiosity-inducing items (trivia questions) or whether they would extend to unrelated stimuli (neutral faces) presented in the same temporal context. In Session 1, younger and older adults learned trivia selected to elicit high or low levels of curiosity. Trivia items alternated with unrelated face stimuli. Participants in the money condition earned bonus payments for correct answers to trivia questions, whereas participants in the no-money condition did not. In Session 2 (24 hrs. later), all participants completed trivia recall and face-recognition tasks. Both curiosity and money enhanced trivia memory, but had no effect on face memory. Furthermore, money boosted memory for low-curiosity trivia only. These findings extend knowledge about motivation-cognition interactions across the lifespan, and may inform best practices in educational programs targeting younger and older learners.

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46: Aging Differentiates Reliance on Reactive and Proactive Control of Stroop Interference
Poster Session: D
Presenter: Katherine K White, Rhodes College
Keywords: Cognitive Control, Congruency Sequence Effect, Cueing, Stroop Interference
Abstract: The dual mechanisms of control (DMC) framework proposes two modes of cognitive control that are differentially affected by age. Specifically, older adults are thought to rely more heavily on reactive, or post-conflict adjustments to interference, instead of proactive, or anticipatory adjustments. The current study examined age differences in reliance on these two mechanisms in a Stroop conflict adaptation task. Reactive adjustments to conflict were investigated via the congruency sequence effect (CSE), or reduced interference when an incongruent trial follows an incongruent versus a congruent trial. Proactive adjustments to conflict were investigated by presenting cues that indicated the congruency of the upcoming trial in one block of trials and no cues in the other block. Whereas younger adults showed a cueing effect regardless of whether cues were presented in the first or second block, older adults benefited from cues only when they were presented in the second block. However, older adults demonstrated a reliable CSE that was independent of cueing; a CSE was not found in younger adults. Taken together, these results indicate an age-related shift from proactive to reactive adjustments to control, as well as selective use of proactive adjustments by older adults. The theoretical implications for understanding age-related changes in cognitive control will be discussed.

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47: Age Differences in Learning and Memory of Information with Arbitrarily Assigned Social Significance

Poster Session: D

Presenter: Lixia Yang, Ryerson University

Keywords: Associative Memory, Episodic Memory

Abstract: Age-related associative memory deficits have been well documented. Recent research suggests that this deficit could be reduced for names and occupations associated with faces presented as socially significant (e.g., smiling, with descent occupations, and will have personal interactions, Hargis & Castel, 2017). However, it is unknown whether the effect will be generalized to neutral faces arbitrarily assigned as socially important. To address this question, we tested young and older adults with a face-name-occupation triplet learning task. All faces were with neutral-expression, evenly and arbitrarily cued as socially “important” (with an orange frame) or “unimportant” (without a fame). Participants studied the same 16 triplets and then recalled the names and occupations in an immediate free recall test repeatedly across four blocks. Then a cued recall test followed in which they recalled the name and occupation associated with each face cue. The results showed reduced memory for names but intact memory for occupations in older relative to young adults in both free recall and cued recall. Relative to older adults, young adults showed a steeper learning in name recall, particularly in earlier blocks for those assigned as socially important. Older adults’ learning, however, did not vary by social importance for either names or occupations. Overall, the results suggest that the arbitrarily assigned social importance apparently benefit young, but not older adults, in their memory for names associated with faces.

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48: Age related neural-vascular uncoupling impairs modulation of neural resources in response to variations in cognitive task demand

Poster Session: D
Presenter: Yuguang Zhao, University of Texas at Dallas
Keywords: Speed of Processing, Cognitive Decline, Calibrated fMRI, Neural-Vascular Coupling.
Abstract: Age-related decline in the modulation of neural recruitment with increasing cognitive task demand has been observed in many studies using blood-oxygen-level-dependent signal (BOLD). We measured age-changes in demand-related neural modulation in physiological factors underlying BOLD signal while participants performed a digit-symbol-verification task (DSVT). Participants were presented with a key of multiple digit-symbol pairings simultaneously with a single digit-symbol probe pair. Participants judged if the probe pair matched one of the key-pairings. The digit-symbol pairings in the key varied parametrically in set-size between 1-, 3-, and 9 items. Utilizing a dual-echo fMRI sequence, BOLD and cerebral-blood-flow (CBF) were simultaneously measured during the task. A CO2 inhalation procedure enabled calculation of cerebral metabolic rate of oxygen (CMRO2). In both age groups, reaction time increased monotonically with set-size increases. Across set-size conditions, older adults were slower than younger adults. FMRI results showed that, as set-size increased, younger adults demonstrated monotonic increases in ΔBOLD, ΔCBF and ΔCMRO2. Older adults showed discrepancies between these three measures: while ΔBOLD plateaued at the highest demand, ΔCBF and ΔCMRO2 demonstrated an inverted U-shape pattern as set-size increased. As task demand increased, the temporal coupling between ΔBOLD and ΔCBF increased in younger adults but decreased in older adults. Compared to younger adults, older adults also showed lower baseline CBF, but higher ΔBOLD, ΔCBF, and ΔCMRO2. These results suggest that age-related impairments in neural-vascular coupling limit older adults’ capacity to modulate neural resources in response to variations in task demand.
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49: Sex differences in the effect of age on memory-related brain function
Poster Session: D
Presenter: Sivaniya Subramaniapillai, McGill University
Keywords: Neuroimaging: Functional, Memory, Functional Connectivity, Neurovascular Coupling
Abstract: Task fMRI studies of aging and episodic memory often report age-related increases in prefrontal cortex (PFC) activity during episodic encoding and/or retrieval, which have been interpreted as reflecting compensation in the ageing brain (Davis et al., 2007). However, past studies combined data from women and men and did not consider the possibility that there may be sex differences in the effect of age on memory-related brain function, even in the absence of sex differences in memory performance. In the current study we examined sex differences in the effect of age on memory-related brain activity during the encoding and retrieval of face-location (spatial context) associations. Forty-one women and 41 men between the ages of 21 to 76 years participated in this study. Between-group partial least squares (PLS) analysis was used to directly test for sex-group differences and similarities in age-related and performance-related patterns of brain activity. Our behavioral analysis indicated no significant sex differences in retrieval accuracy on the fMRI tasks. Our B-PLS fMRI analysis indicated that there were sex differences in the effect of age on memory-related activity within PFC, IPC, PHG and lateral occipital-temporal cortices. Overall, we found age-related increases in brain activity predominantly in women,
compared to men. Moreover, in women, age-related increases in fronto-parietal activation at encoding correlated with better subsequent memory. These findings suggest that the neural underpinnings of age-related memory decline differs in women and men, and that future studies should consider sex when examining how ageing effects memory-related brain function.

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50: Memory without intention: The effect of task demands on age differences in neural activation at retrieval
Poster Session: D
Presenter: Karen L Campbell, Brock University
Keywords: Neuroimaging: Functional, Memory, Functional Connectivity, Neurovascular Coupling
Abstract: Experimental tasks rarely measure a single cognitive function. For instance, a task designed to measure memory retrieval not only measures retrieval, but a whole host of other cognitive processes (e.g., maintaining instructions, inhibiting distraction). Insofar as these other demands require attentional control, which is known to decline with age, commonly observed increases in frontal activation with age may reflect older adults' increased responding to task demands rather than a change in the way the aging brain carries out a given cognitive function. We have shown that task demands are associated with increased frontal activation during language processing, but it remains to be seen whether this is also the case for memory. In this talk, I will present recent EEG data from younger and older adults during voluntary and involuntary memory retrieval – the latter places minimal demands on participants and tends to be preserved with age (Berntsen et al., 2017). Time frequency analysis of the EEG data shows greater alpha desynchronization over frontal sites during voluntary than involuntary retrieval in young adults, suggesting greater control during voluntary retrieval. Older adults, on the other hand, showed similar alpha desynchronization regardless of the intention to retrieve, suggesting greater retrieval effort even when task demands are minimal, though we still cannot rule out the possibility that their greater desynchrony was in response to the cover task itself. This work highlights the need to examine age differences in brain function under naturalistic conditions that minimize task demands, even though creating those conditions may be difficult.
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51: Perceived Neighborhood Stress is Associated with Cognitive Performance Variability
Poster Session: D
Presenter: Elizabeth Munoz, University of Texas at Austin
Keywords: Intraindividual Variability, Emotion and Affect, Lifestyle Correlates, Attention, Methods
Abstract: The neighborhood environments where individuals grow up and develop can be sources of resilience or stress that support or diminish cognitive health (Clarke et al., 2012). Living in a neighborhood that is perceived to be problematic or stressful may promote psychological distress (Steptoe & Feldman, 2001) which may in turn limit attentional resources resulting in reduced average cognitive performance and greater trial-to-trial performance variability (e.g., Stawski, Sliwinski, & Smyth, 2006). We tested the prediction that greater neighborhood stress would be associated with lower cognitive performance and greater performance variability in spatial and speed of processing tasks in a sample of midlife adults from the CATSLife study (N=1,141; Mage=33.03 (4.80)). Participants completed self-reported measures of neighborhood problems across multiple domains (e.g., safety, crime, aesthetics, disorder) and underwent multi-trial assessments of spatial and speed of processing abilities. We computed person-specific standard deviations across trials for each task to index performance variability and controlled for mean performance, relevant demographics, and family clustering in multilevel models. As expected, greater mean performance was correlated with lower variability (rs range: -.65 to -.88, ps<.01) and perceived neighborhood stress predicted lower average performance (Bs range: -.13 to -.05, ps<.05). Contrary to expectations, neighborhood stress also predicted lower performance variability (Bs range: -.11 to -.05, ps<.05). There results may be indicative of increased vigilance among those living in stressful neighborhoods (e.g., McCoy, Raver, & Sharkey, 2015) that may have longitudinal implications for cognitive health and point to the utility of evaluating dimensions of cognitive function beyond mean performance.

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52: Using Intraindividual Variability as an Indicator of Cognitive Improvement in the EXCEL Physical Exercise Intervention

Poster Session: D
Presenter: Allison A. M. Bielak, Colorado State University
Keywords: Intraindividual Variability, Emotion and Affect, Lifestyle Correlates, Attention, Methods

Abstract: Intervention programs designed to improve cognitive ability in older adults with mild cognitive impairment (MCI) have often focused on physical exercise to improve traditional measures of cognition, with mixed success. Individuals with MCI show high levels of intraindividual variability in response speed (IIV), and IIV may be sensitive to intervention-related changes. The current study evaluated if participants who participated in a physical activity intervention (aerobic or resistance training) showed a reduction in IIV, compared to a balance and tone control group. Women aged 70-80 years with probable MCI participated in the EXercise for Cognition and Everyday Living (EXCEL) Study (n = 89), a six-month RCT designed to investigate the effects of different physical exercises on cognitive ability. Participants completed 1-back, task switching, and spatial working memory tasks at baseline, 13 weeks (midpoint), and upon completion of the program. Analyses were conducted following both the intent-to-treat principle and complier average casual effect modeling, controlling for age, education, and depressive symptoms at baseline. Participants in the intervention group who complied with even 50% of the program showed reduced IIV on task-switching at midpoint and post-intervention. Physical exercise resulted in improved IIV in older adults with probable MCI, showing that IIV is modifiable by lifestyle engagement. IIV can provide information on plasticity that traditional cognitive measures do not, and can be a complementary measure for evaluating intervention effects on cognition, particularly amongst those with cognitive impairment.
1: EEG correlates of working memory and inhibition as a function of age

**Poster Session:** E

**Presenter:** Stephen P Badham, Nottingham Trent University

**Keywords:** EEG, Eye Tracking, Working Memory, Inhibition

**Abstract:** Evidence supports a double dissociation for age-associated impairments in working memory and inhibition. Understanding brain mechanisms that underpin cognitive decline is possible using psychophysiological methods, such as electroencephalography (EEG) and eye-tracking. The current study investigated EEG predictors of inhibition and working memory in typically-aging older adults (n=31) and young adults (n=31). General mental state was assessed with the Geriatric Depression Scale, Mini Mental State Exam and Alzheimer's Disease Assessment Scale. General cognitive functioning was assessed using tests for verbal learning (Hopkins test), task switching (Trails a and b) and verbal IQ (National Adult Reading Test). In addition, participants completed tests of working memory (forwards and backwards digit and spatial span) and inhibition (day-night task). Inhibition was further investigated using eye tracking (saccades, antisaccades, and a Go-No-Go paradigm). Resting state EEG was assessed at 128 electrodes during eyes-open and eyes-closed conditions. Regression methods will be used to investigate EEG predictors of inhibition and working memory as a function of group.

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2: Processing speed and time constraints during encoding and retrieval as mediators of age-related associative deficits in episodic memory.

**Poster Session:** E

**Presenter:** Britney M Bishop, University of Missouri- Columbia

**Keywords:** Associative Memory, Associative Binding, Episodic Memory, Speed of Processing

**Abstract:** Relative to young adults (YAs), older adults (OAs) exhibit a deficit in associative episodic memories, although memory for individual components of episodes remains relatively stable across the lifespan. Furthermore, this associative memory deficit (Naveh-Benjamin, 2000) has been associated with a tendency for OAs to be affected by item familiarity, resulting in higher false alarm rates than their younger counterparts when being tested on memory for paired stimuli (Mohanty, Naveh-Benjamin, & Ratneshwar, 2016). The processing speed theory of cognitive aging (Salthouse, 1995; Salthouse, 1996; Levitt, Fugelsang, & Crossley, 2006) suggests that OAs’ associative deficit may reflect a slowed cognitive processing speed; however, simply allowing OAs more time to encode stimuli does not eradicate the deficit (Burton, Lek, Dixon, & Caplan, 2019). In Experiment 1, we attempted to simulate the associative deficit in YAs via speeded conditions at encoding and retrieval for face-scene pairs. We additionally examined hit and false alarm frequencies to determine if reduced processing time would reveal a pattern.
similar to that seen in OAs, thereby supporting the hypothesis that processing speed mediates the associative deficit. In Experiment 2 we sought to determine whether additional time at both encoding and retrieval would reduce the associative deficit in OAs. Specifically, we assessed the influence of self-pacing on OAs’ ability to accurately form and access associative memories for face-scene pairs. We also examined in both experiments the relationship between an individual’s processing speed and performance on the associative memory task. Results will be presented and discussed vis-à-vis processing speed theory.

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3: Impact of Individual and Spousal Personality and Need for Cognition on Memory

Poster Session: E

Presenter: Julie Blaskewicz Boron, University of Nebraska, Omaha

Keywords: Memory, Personality, Lifestyle Correlates, Individual Differences, Couples

Abstract: Research has documented relationships between individuals’ personality and cognitive ability. Although much prior work has focused on personality traits affiliated to the Big Five, there is also evidence that Need for Cognition (NC; Cohen, Stotland, & Wolfe, 1955) has important links to cognitive performance, intelligence, and personality, specifically openness to experience (Soubelet & Salthouse, 2017). Cacioppo, Petty and Feng Kao (1984) operationalized NC as “an individual's tendency to engage in and enjoy effortful cognitive endeavors.” Although these relationships have been examined at the individual level, the impact of both individual and spousal personality and NC on cognitive performance has not been investigated. Prior research has suggested older adults may benefit on memory tasks by collaborating, such as with a spouse. Thus, the current study examines the individual and synergistic effects of individual and spousal personality (Pessimism/Optimism, Big Five) and NC on verbal memory assessed via immediate and delayed recall of a 10-word list. The analysis considers both overall NC, as well as two validated sub-facets: Cognitive Enjoyment and Cognitive Effort. The analysis was conducted with a large sample of married couples (N=1924 couples; age range: 30-96 years; mean age=65) from the Health and Retirement Study using Actor-Partner Interdependence models with SAS PROC MIXED. Results revealed significant individual and spousal effects, suggesting that the combination of traits within older married couples play an important role in memory performance and highlight the benefit of considering the larger social context. Implications for future research related to both personality and social influences are discussed.

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4: Age, Immediate Memory, and Affective Symptoms as Predictors of Functional Status among Older Adults

Poster Session: E

Presenter: Hannah R Bogoian, Georgia State University

Keywords: Functional Ability, Everyday Memory, Emotion and Affect

Abstract: The preservation of functional ability plays a key role in the maintenance of high quality of life across the lifespan. Both deficits in immediate memory and depressive symptoms are known to have a negative impact on functional status among older adults, however less is known about how these variables interact with one another to predict functional status, and whether or not those effects differ between stages of later life. Thus, this study examined how age, immediate memory, and affective symptoms predict functional disability among older adults. A diverse community sample of 40 adults aged
60 to 93 (M=70.08, SD= 7.84) completed the Functional Status Index (FSI) to assess functional ability, the 36-Item Short Form Health Survey (SF-36) to assess symptoms of depression and anxiety, and Digit Span Forward to assess immediate memory. A multiple regression analysis was used to examine age, immediate memory, affective symptoms, and the interactions between these variables as predictors of functional status. Education and socioeconomic status were covariates. The analyses revealed that higher affective symptoms were associated with greater functional disability. A significant interaction between age, immediate memory, and SF-36 Mental Component Summary scores revealed that at older ages, the combination of lower immediate memory and higher affective symptoms was associated with the greatest disability. Thus, it is important to consider the impact of poor immediate memory function among older adults with affective symptoms as an additional risk factor for functional disability in late life.

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5: Age Differentially Effects Subcomponents of Working Memory

Poster Session: E
Presenter: Kellie E Brown, Idaho State University
Keywords: Working Memory

Abstract: Researchers who use complex span tasks to assess working memory (WM) typically examine the storage component of WM only and not the processing component, as they are often highly correlated (e.g., Conway, 2005). However, less is known about whether there exists a differential effect across components within a cognitive aging context. Therefore, the present study examined both WM components using an operation span task in young (N=126; Mage=21.94, SD=5.23 years) and older adults (N=102; Mage=67.11, SD=5.24 years). After completing the task, each age group was separated into low, medium, and high span groups (tertiles) for WM-processing and WM-storage performance. 2(age: young, old) x 3(span: low, medium, high) between-group ANOVAs revealed that for both WM components, as expected the young adults outperformed the old (both ps < .05). However, while there was a significant age x span interaction (F(2,223) = 5.77, p=.004) for WM-processing, this interaction did not reach significance for WM-storage, (F(2,223) = 2.96, p>.05). Post hoc analyses revealed that the driver of the interaction was from the low span group, as there were no age effects for the medium and high span groups in WM-processing. Altogether, these results suggest that age differences in WM may be due to declines in WM-storage moreso than declines in WM-processing or both. Additionally, given the important role that WM plays in activities of daily living we identify that older individuals with low WM-processing spans specifically, are especially vulnerable to cognitive aging, and may be a fruitful population for targeted WM interventions.

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6: Traits and empathic concern as predictors of prosociality in aging
Poster Session: E
Presenter: Elena Cavallini, Department of Brain and Behavioral Sciences, University of Pavia, Italy
Keywords: Social Cognition, Personality
Abstract: Past literature on prosocial behavior in aging has mainly focused on age-related differences. However, the analysis of the predictors of prosociality in late adulthood is still underinvestigated. The present study examined how personality traits predict prosocial behaviors, while considering the mediation effects of empathic concern. In a sample of 150 participants aged 55 to 86 years old (Mage = 69.52) we assessed the frequency of helping behaviors in real life (by using the Altruism module of the General Social Survey) and the willingness to give money in an experimental setting (through the computerized version of the Dictator Game). In order to measure personality dimensions and empathic concern we used the Big Five Questionnaire and the Empathic Concern subscale of the Interpersonal Reactivity Index, respectively.

Based on path analysis models, results revealed that traits predict prosocial behavior, either directly or through empathic concern, and show that empathic concern operates at an intermediate level. Interestingly, we found that the association between traits and prosocial behavior varies with the form of giving and with the characteristics of the potential beneficiary. Regarding helping behavior, results indicated agreeableness and openness as key personality factors. With regard to willingness to give money, all five traits were, even if differentially, associated to prosocial behavior depending on the features of the recipient. Age resulted as a moderator of the relationship between traits and empathic concern and prosocial behavior.

These findings have important implications for the understanding of the motives that drive altruistic action in aging.

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7: Levels of Specificity in Associative Episodic Memory: Insights from Graded Responses by Younger and Older Adults
Poster Session: E
Presenter: Sydney Chism, Memory and Cognitive Aging Laboratory, University of Missouri
Keywords: Associative Memory, Episodic Memory, Measurement
Abstract: Recent evidence showing that older adults can remember the gist of associations in memory, but tend to forget the specific representations (Greene & Naveh-Benjamin, in press), provides strong support for the suggestion that older adults have fuzzier episodic memories than younger adults. That study also suggested that episodic memory can be accessed on a continuum of specificity and demonstrated this by way of a multinomial processing tree (MPT) modeling analysis. However, there is a large debate in the field as to whether recognition proceeds on a discrete-state basis, implied by the MPT approach, or on a continuous basis, implied by signal detection theory (SDT). Here, we test whether levels of specificity in associative episodic memory can be gleaned from a ratings task, and we plot receiver operating characteristic (ROC) curves to test whether the results of Greene and Naveh-Benjamin can be
reconciled with a SDT analysis. Results will be discussed in the context of aging and associative memory deficits (e.g., Naveh-Benjamin, 2000).

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8: Effects of Normative Category Typicality on Memory Performance in Both Young and Older Adults
**Poster Session:** E
**Presenter:** Taylor M Curley, Georgia Institute of Technology
**Keywords:** Memory, Semantic Memory, Episodic Memory
**Abstract:** Attempting to remember a category exemplar from memory can lead to a retrieval process that relies on both controlled and automatic influences, such as familiarity (McCabe, Roediger & Karpicke, 2011; Hunt, Smith, & Toth, 2016). Automatic processing in such tasks is likely to result in false memory for exemplars related to the target word, particularly in the case of older adults (Schacter, Koutstaal, & Norman, 1997). Here, we examine the influence of normative category membership (Van Overschelde et al., 2004) on cued-recall and recognition memory performance in both older and young adults using data from a recent study (Hertzog, Curley, & Dunlosky, In Prep.). The task includes presentation of four randomly-selected noun exemplars (e.g., APPLE) from one of 40 categories (e.g., FRUIT), with an orienting task asking people to identify a feature of the target word that was either shared with other exemplar or that was distinctive to only the target word. Distinctive processing produced fewer recall intrusion errors and fewer recognition errors than with shared-feature processing. Typical targets were more likely to be remembered than atypical targets for both age groups using either orienting tasks. Univariate tests showed that older adults were significantly more likely to report incorrect, but highly-typical exemplars during recall and recognition than young adults after shared-feature processing. Multilevel models controlling on both item- and group-level characteristics showed significant age by typicality interactions during recognition memory. We interpret our findings with respect to the effects of age, semantic competition, and test format on memory errors.

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9: Semantic Knowledge and Memory Performance Across Adulthood
**Poster Session:** E
**Presenter:** Lisa Emery, Appalachian State University,
**Keywords:** Memory, Associative Memory, Intelligence
**Abstract:** The Wechsler Memory Scale - Fourth Edition (WMS-IV) includes two tests of auditory memory: Logical Memory (LM; memory for elements of a story) and Verbal Paired Associates (VPA; memory for learning related and unrelated word pairs over four repeated trials). We examined patterns of age differences on these tests using the WMS-IV normative data and data collected from our laboratory. In the normative sample (N = 1200; ages 20-90), LM and VPA showed different patterns of age-related decline. LM performance remained stable up until age 69, and declined sharply thereafter. In contrast, VPA performance declined linearly from age 20. We then used VPA data collected in our laboratory (N = 248; ages 20-85) to compare age differences in learning of the related (N = 4) vs. unrelated (N = 10) word pairs. Consistent with prior research, overall age differences were large for unrelated pairs, F(1,242) =
25.59, p < .001, ηp2 = .10, but not for related pairs, F(1,242) = 1.55, p = .215, ηp2 = .006. In addition, initial memory (i.e., memory after one exposure) was associated with WASI-2 Vocabulary performance, r(246) = .17, p = .007, but memory after repeated trials (e.g., memory after 4 exposures) was only associated with WASI-2 Matrix Reasoning performance, r(246) = .51, p < .001. Taken together, these results suggest that age differences in learning new associations start early in adulthood, and are likely related to differences in fluid intelligence. Immediate recall in a semantic context, however, is largely spared until older ages.

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10: Overcome with emotion? Age deficits in metamemory accuracy for emotional words may be explained by age differences in multiple-cue use in the presence of a salient cue

Poster Session: E
Presenter: Ethan Flurry, Mississippi State University
Keywords: Metacognition, Memory, Emotion and Affect
Abstract: Older adults’ ability to make accurate metamemory judgments indicates that aging spares metamemory (Eakin & Hertzog, 2006; 2012; but see Souchay et al., 2006). However, age differences in metamemory accuracy for emotional information, specifically for positive and neutral words, indicate potential age-related impairment of metamemory (Tauber & Dunlosky, 2012; Flurry & Eakin, in prep). These age differences may be explained by cue overshadowing effects (Price & Yates, 1993) in which older adults primarily used the salient cue—emotional valence—and overlooked additional cues that were diagnostic of memory. We hypothesized that age differences in metamemory for emotional words may be eliminated when older adults have a second salient and diagnostic cue to inform JOLs. We manipulated multiple cues—emotional valence and endorsement (Craik & Tulving, 1975)—using a category inclusion task for which participants responded yes or no to endorse positive words (e.g. “champion”) or neutral words (e.g. “sphere”) as category members (e.g. “is an achievement”). Preliminary age comparisons in free recall and JOL magnitude between levels of emotional valence (positive, neutral) and levels of endorsement (yes, no) indicate that both younger and older adults’ JOL magnitudes responded to emotional valence and endorsement effects in memory. Preliminary JOL accuracy results suggest that including a second salient cue eliminated previously reported age differences in metamemory for positive and neutral words. Thus, age differences in metamemory for emotional words may be attributed to diminished multiple-cue use by older adults when presented with a strong salient cue such as emotional valence.

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11: The relation between executive function and affective function: A comparison of cross-sectional and longitudinal analyses

Poster Session: E
Presenter: Jon Grenzke, Boston College
Keywords: Emotion and Affect, Cognitive Control, Longitudinal
Abstract: Cross-sectional data suggest a relation between executive function (EF) and affective function (AF), with better EF tied to more positive AF. Because most longitudinal datasets focus either on EF or AF, and not both, there have been few opportunities to examine whether this relation holds in longitudinal data. To address this question, we examined the relation between EF and AF using both cross-sectional...
and longitudinal designs. We used data from a battery of EF (arithmetic, digit span, mental control, FAS fluency, digit-symbol) and AF (PANAS-positive, ERQ Reappraisal, ERQ Suppression, Beck anxiety, Beck depression, PANAS-Negative) measures that we had collected from adults ages 55 and older. Using a Principal Components Analysis, we identified one underlying EF factor and two underlying AF factors, one related to negative/maladaptive affect and one more reflective of positive affect/emotion regulation. In cross-sectional analyses, as expected, lower scores on EF were associated with higher scores on tasks loading onto the negative/maladaptive AF factor and lower scores on tasks loading onto the positive AF factor. We then examined the data in a longitudinal manner, using the subset of older adults from whom we had two time-points of measurements. The longitudinal data showed similar EF-AF relations as those revealed in the cross-sectional analyses and additionally suggested that, as EF declines, adults may shift from reliance on reappraisal toward reliance on suppression. These results suggest that, in terms of the relations between EF and AF, the patterns revealed in cross-sectional analyses reasonably approximate those that arise with longitudinal change.

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12: How emotions influence arithmetic performance during aging?
Poster Session: E
Presenter: Bastien BH HILAIRE, Laboratoire de Psychologie Cognitive, Aix-Marseille University & CNRS
Keywords: Emotion and Affect, Arousal, Verification Tasks, Problem Solving
Abstract: The aim of this study was to investigate how emotions influence young and older adults’ performance in arithmetic problem verification tasks. Fifty young (mean = 22 y.o.; range = 18-29 years) and 50 older healthy adults (mean = 72 y.o.; range = 62-85 years) verified arithmetic equations (e.g., 6+7=13. True or false?). We manipulated problems characteristics like veracity (i.e., true / false), difficulty (i.e., easier / harder), and differences between proposed and correct sums for false problems (i.e., small-split / large-split). Participants saw emotionally negative (e.g., mutilations) or neutral (e.g., chair) pictures for 500 ms before each problem. Overall, we found changes in both young and older adults’ performance for negative emotion trials, when arousal of emotional pictures was high. Indeed, results showed increased effects of problem difficulty (i.e., differences between easier and harder problems) and of splits (i.e., differences between small-split and large-split problems) after processing highly intense negative pictures. These results suggest that influence of emotions on arithmetic performance depends on the level of arousal of negative emotions. This relation does not change during aging.
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13: Low sleep and circadian stability liked to poorer episodic memory in older adults and racial/ethnic minorities
Poster Session: E
Presenter: Emily Hokett, Georgia Institute of Technology
Keywords: Associative Memory, Sleep Quality, EEG
Abstract: Compared to young adults, older adults tend to experience reduced sleep quality and more fragmented sleep-wake patterns. Greater sleep quality and more consistent activity rhythms have been linked with better episodic memory performance. Considering that older adults concomitantly experience
age-related changes in circadian activity rhythms, sleep quality, and episodic memory, individual differences in circadian rhythm and sleep quality may contribute to the variance in age-related reductions in episodic memory. Previous studies investigating these associations have not included racial group as a variable of interest. Racial/ethnic minorities consistently report poorer sleep quality than non-racial/ethnic minorities, but there is limited information regarding how these differences affect episodic memory. Thus, further investigation of the relationships among circadian activity rhythms, race/ethnicity, and episodic memory is warranted. To address these underexplored questions, we used actigraphy to measure circadian activity rhythms in a racially diverse sample of young and older adults for one week. Then, participants were asked to return to the lab and complete an associative memory task while electroencephalography (EEG) was recorded. EEG was used to assess neural oscillations underlying successful memory retrieval. We found that older adults performed worse than young adults on the associative memory task, and there was a significant correlation between better associative memory performance and greater sleep stability in older adults, but not young adults. There was also a significant relationship between greater circadian stability and greater memory-related neural oscillations in older adults. Furthermore, we found that racial/ethnic minorities demonstrated less stable sleep quality than non-racial/ethnic minorities, and their poorer sleep quality was linked to reduced memory-related neural oscillations. Taken together, this research highlights the importance of greater stability in sleep and daily activity rhythms for episodic memory, particularly in older adults and racial/ethnic minorities.

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14: Associations of cognitive status and age with cognitive variability across different time scales

Poster Session: E
Presenter: Jinshil Hyun, Albert Einstein College of Medicine
Keywords: Response-Time Modeling, Speed of Processing, Mild Cognitive Impairment

Abstract: Background. Within-person variability in response time of speeded cognitive tasks may be an early indicator of normative and pathologic cognitive aging. Although prior studies suggest that cognitive variability adds to the predictive utility of cognitive assessments over and above mean levels of performance, little is known whether variability quantified across different time scales would have similar predictive patterns. The aim of the current study is to examine how variability quantified across different time scales (i.e., trial-to-trial, session-to-session within days, day-to-day) is associated with mild cognitive impairment (MCI) and age.

Methods. A probability sample of 243 racially diverse older adults (Mage = 77; range 70-91) completed a 12-trial symbol search speed of processing task administered on smartphones, 6 times a day, for 14 days. Trial-to-trial, session-to-session, and day-to-day variability was quantified with the residualized intraindividual standard deviation to statistically control for systematic confounds (e.g., time-of-day, retest effects). Each variability metric was regressed on age, MCI status, sex, and race/ethnicity.

Results and Discussion. Variability computed by different temporal resolution was differentially sensitive to MCI status and age. Having MCI was significantly associated with greater variability at all levels (b=505.8, SE=328.8, p<.001 for trial-to-trial; b=163.6, SE=23.7, p<.001 for session-to-session; b=110.5, SE=18.5, p<.001 for day-to-day). Being older was significantly associated with greater trial-to-trial variability (b=8.7, SE=4.3, p=.04) but not with other variability metrics. Results suggest variability quantified across different time scales seems to be a useful marker for pathologic aging, while trial-to-trial variability may be useful for normal aging among older individuals.

Authors:
15: Executive function abilities in the healthy young and older adult populations
Poster Session: E
Presenter: Mojitola Idowu, Brunel University London
Keywords: Executive Function, Cognitive Ageing, Cognitive Decline
Abstract: Executive functions are traditionally conceptualised as a set of high-level mental processes regulating our cognition, such as inhibition, shifting, or updating. It has been shown that with ageing these functions deteriorate gradually over time. However, the rate of deterioration of individual EFs is less understood.

In this cross-sectional study, cognitively healthy young and older adults were assessed on four different executive functions dual-tasking, inhibition, shifting and updating, to better understand the nature and rate of their deterioration. Two separate tasks were utilised to measure each aspect of EF, dual-tasking (the Test of Everyday Attention dual task telephone search subtest and Psychological Refractory Period paradigm task), inhibition (the Hayling Sentence Completion test and Stroop task), shifting (the Trail Making Test and a computer-based task switching test), and updating (the backward digit recall span test and a computer-based N-back task).

The results demonstrated that the older adult group performance was generally inferior to the younger age group. This was particularly evident in the updating tasks, i.e. the n-back task, as it required the use of working memory, and memory worsening is a major complaint of ageing adults. Additionally, the older group exhibited noticeably longer response times during the Psychological Refractory Period paradigm, task switching, and N-back tasks resulting in incorrect responses being recorded. However, both groups seem to perform similarly in the inhibition tasks, indicating this EF was not as greatly affected by ageing. Thus, indicating that different aspects of our cognition deteriorate at dissimilar rates during regular ageing.

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16: Protective effect of Physical Activity on Episodic Memory during aging: The role of Executive Function
Poster Session: E
Presenter: Hajer Kachouri, University of Tours, Centre de Recherche sur la Cognition et l'Apprentissage (CeRCA)
Keywords: Cognitive Decline, Episodic Memory, Executive Function, Cognitive Reserve, Physical Activity
Abstract: Cognitive aging is associated with a decline of episodic memory (EM) (Craik & Jennings, 1992) and executive functioning (EF) (West, 1996). Several lifetime exposures, including physical activity (PA), may limit the effects of cognitive decline by forming a “cognitive reserve” (Scarmeas & Stern, 2003). PA may be positively associated with cognition in aging (Stern, 2002, 2003, 2009) especially for EF (Colcombe & Kramer, 2003). The aim of this study was to determine the effect of PA on EM and EF during aging. 20 younger adults (20- 40 years old) and 27 older adults (60 to 80 years old) participated to this study. EM’s
performances were assessed using a resource-dependent cued recall task (with cognitive charge during encoding). An executive index was calculated based on the performance of three specific tests (Stroop; TMT; N-back) and Baecke inventory was used to estimate the level of PA (Baecke & Fruers, 1982). GLM analyses on EM and executive index showed an interaction between age group and PA level indicating that the effect of age is less considerable for the active older adults. In other words, results have shown a beneficial effect of the PA on EM and executive functions especially for older adults. Moreover, regression analyses suggest that EF mediates the protective effect of PA on EM. In conclusion, PA, by protecting from executive age-related decline, would reduce the deleterious effect of aging on EM.

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**17: Oscillatory activity supports contextual binding in young and old adults**

**Poster Session:** E

**Presenter:** Anna E Karlsson, Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin

**Keywords:** Episodic Memory, Associative Memory

**Abstract:** Reinstatement of the learning context at retrieval boosts memory. Although older adults (OA) benefit from context reinstatement, they show difficulties retrieving item-context associations compared to younger adults (YA). To understand these age differences, we investigated the neural mechanisms of memory formation of item and context information in YA and OA.

Pictures of objects were shown in a pre-learning fMRI session. Afterwards, in an implicit learning task, participants bound these objects to background pictures serving as context, while undergoing EEG measurement. Objects were presented again in a post-learning fMRI session. In a final recognition memory test, participants discriminated between new objects and old objects presented on backgrounds that were the same as during learning or different than during learning. Participants judged (a) whether the item and (b) whether the item-context pairing was old or new.

Item recognition did not differ between YA and OA, and both groups benefited from context reinstatement. However, pair memory was reduced in OA.

A linear mixed effects model was used to investigate age differences in the neural correlates of memory formation supporting retrieval. Single-trial theta and alpha power at encoding were reliable predictors of later item memory in both age groups. However, both were better predictors for later pair memory in YA than in OA.

Current work relates behavioral context effects and oscillatory activity to learning-induced changes in item representations in the hippocampus, as measured with fMRI. Thus, our data provides novel insights into the neural substrates of contextual binding in YA and OA.

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18: Cognitive ability may influence “success” of suppression during cognitively demanding tasks
Poster Session: E
Presenter: Rebekah C Knight, North Carolina State University
Keywords: Emotion and Affect, Executive Function
Abstract: Emotion regulation can have several short-term consequences, some of which may be seen in performance on cognitively demanding tasks. Strategies that strain cognitive resources (e.g., suppression) may impair executive functioning more than less demanding strategies (e.g., reappraisal). This is evident across the aging process, as resources become more limited. Effects of regulation can also be seen in physiological indicators (e.g., systolic blood pressure [SBP]). Higher levels of arousal tend to elicit regulation efforts and are associated with blood pressure variability. “Successful” regulation can be represented by more stability in physiological indicators of arousal. The question of interest in the current study relates to the relationship between emotion regulation, cognitive ability, and SBP: Does cognitive ability moderate the relationship between emotion regulation and a “successful” (i.e. stable) outcome? Using existing data from the final wave of a longitudinal study on aging, we examined variability in patterns of arousal—reflected in stability of SBP responses in response to a cognitive challenge—in a sample of older adults (N = 47 M = 74.26, range = 67 – 84; 44.7% female). Moderation analyses revealed a significant interaction between suppression and cognitive ability, F(3,40) = 3.71, p = .019, b = -1.13, t = -3.01, p = .004. This reflected the fact that those high cognitive ability were better able to modulate arousal during the task than those who are low in ability. A similar analysis examining reappraisal revealed no significant effects, suggesting that ability is most relevant for those using demanding regulation strategies.
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20: Impacts of intergenerational programmes on older adults’ cognitive, social and health outcomes: A systematic review
Poster Session: E
Presenter: Anna Krzeczkowska, University of Strathclyde
Keywords: Older adults, Health and Well Being, Cognition, Social Functioning, Intergenerational Engagement
Abstract: Intergenerational engagement activities that promote older people’s health and wellbeing can constitute a means of responding to the needs of a growing ageing population. This systematic review evaluated the impacts of intergenerational engagement on cognitive, social and health outcomes in older adults. Systematic literature searches were undertaken across four databases. The review included both quantitative and qualitative research involving: a) older adults aged 60 or over, healthy or with mild cognitive impairment, interacting with children or younger adults, and b) both baseline and post-intervention assessment of at least one cognitive, social or health outcome. A narrative approach was used to synthesise the findings. Thirty-six studies were included in the review. Two out of four studies reported a significant effect on at least one cognitive measure, 20 out of 22 showed social benefits, and 24 out of 29 indicated health and wellbeing improvements, but only on selected measures or single subscales. Most studies showed non-significant effects and used qualitative or anecdotal evidence to support the findings. The review revealed some limited evidence for positive impacts of intergenerational engagement on older adults’ cognitive, social and health outcomes. However, no definitive conclusions on effectiveness can be drawn due to the heterogeneity of evidence and limited number of randomised controlled trials (RCTs). This review also highlights the lack of a unified and widely applicable model of
intergenerational engagement and its implementation. More research is required that involves: 1) homogeneous protocols allowing wider implementation and generalisability; and 2) RCTs to provide the highest quality evidence.

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**21: Prior Knowledge Effects on Young and Older Adults’ Reconstructive Memory Strategies**

**Presenter:** Jack M Kuhns, University of North Carolina at Greensboro

**Keywords:** Associative Memory, Everyday Memory, Reconstructive Memory

**Abstract:** Schematic support is the idea that information consistent with prior knowledge is better learned due to enhanced encoding and retrieval operations. Whereas prior knowledge increases memory performance for both young and older adults, less is known about how prior knowledge influences responses when retrieval operations return incomplete or noisy information. The present research investigated how knowledge for grocery prices affected young and older adults’ episodic memory with prices that were either consistent (market-priced) or inconsistent (overpriced) with prior knowledge across two experiments. Participants’ responses were influenced by the range of prices in each condition and experiment. Participants’ inaccurate responses tended towards the mean value in each condition, where lower prices were overestimated, and higher prices were underestimated. The degree of bias in inaccurate responses varied with underlying quality of memory, where the conditions with schematic support were less biased than those without schematic support. Older adults’ response bias was not different from young adults’ in the market-priced condition where their memory was equated. Older adults’ response bias was exaggerated in the condition without schematic support, where their memory was worse than young adults’ memory. These patterns suggest that schematic support improves memory by altering participants’ heuristic strategies.

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**22: The relationship between lifespan socioeconomic conditions and objective and subjective memory in older age**

**Presenter:** Morgane Künzi, Center for the interdisciplinary study of gerontology and vulnerability, LIVES, Overcoming Vulnerability: Life Course Perspective, Swiss National Centre of Competence in Research

**Keywords:** Prospective Memory, Memory Complaint, Socioeconomic Conditions, Lifespan

**Abstract:** Subjective and objective decline in different cognitive abilities is associated with aging but has more recently also been suggested to be linked to socioeconomic conditions. However, the differential impact of socioeconomic conditions at various stages of the lifespan on cognitive abilities is so far not well understood. Therefore, the present study investigates whether lifespan socioeconomic conditions predict subjective and objective measures of memory in older adults differently. Specifically, we examine memory complaints (complaints about memory difficulty in daily life) as reported by older adults as subjective measure, and prospective memory (the ability to remember to perform planned tasks after a certain
Data stem from the second wave of a large-scale Swiss longitudinal study on aging (“Vivre-Leben-Vivere”, n = 1059). Preliminary analysis shows that there is an overlap of lifespan socioeconomic indicators between subjective and objective memory (e.g., education), but that some factors seem to be specific to either subjective (e.g., occupation) or objective memory measures (e.g., father’s occupation, income, and making ends meet). Final analyses are ongoing and will examine the relationship between the different concepts using path analyses. Establishing these factors will allow to not only understand the impact of different lifespan socioeconomic conditions on older adults’ memory but also suggest factors that preventions should target in the future.

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23: Exploring Associations Between Openness to Experience and Cognitive Ability in Older Adults: The Mediating Role of Activity Engagement

Poster Session: E
Presenter: Calum Marr, Department of Psychology, Heriot-Watt University
Keywords: Activity Engagement, Cognitive Decline, Individual Differences, Lifestyle Correlates, Personality

Abstract: Among older adults, positive associations have been reported between Openness to Experience and global cognitive function, as well as performance in specific cognitive domains, including verbal ability, memory, executive function and processing speed. Potential mechanisms accounting for these associations have included the ‘investment theory’, proposing that individuals who are more open to experience engage in more intellectually stimulating leisure activities in their everyday life, which in turn maintains or enhances their cognitive function in old age. Current evidence for this theory is mixed – some studies have found activity engagement to mediate the relationship between Openness and cognitive ability, while others have not. The present study uses baseline data from an ongoing intervention study to examine associations between personality and various cognitive domains, and the extent to which such associations might be mediated by activity engagement. A preliminary analysis of 257 participants aged 65 and over revealed significant positive associations between Openness and verbal comprehension, perceptual reasoning and visual memory. Engagement in intellectually stimulating activities (e.g. visiting a library or learning a language) was found to partially mediate the association between Openness and verbal comprehension, but not perceptual reasoning or visual memory. These findings provide some support for the investment theory, suggesting that older adults who are more open tend to be more intellectually active, which in turn has a beneficial effect on their verbal ability. Planned future analyses will also explore how different types of activity engagement (e.g. physical or social) might also play a role in explaining personality-cognition links.

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Alan J. Gow, Heriot-Watt University
24: Does stereotype threat may reverse the gap between younger and older adults on associative learning tasks.

**Poster Session:** E  
**Presenter:** Marie Mazerolle, Université Bourgogne Franche-Comté  
**Keywords:** Memory, Social Context, Associative Memory, Cognitive Decline, Episodic Memory  
**Abstract:** There is now ample evidence that age-related stereotypes can alter older adults’ memory performance. For example, under stereotype threat, older adults recall and recognize less words (Kang & Chasteen, 2009; Hess, Emery, & Queen, 2009), or demonstrate smaller working-memory capacity (Mazerolle, Régner, Morisset, Rigalleau, & Huguet, 2012). Here we aim at reversing the gap between younger and older adults on a classic associative learning task inspired from Touron & Hertog (2004). More precisely, participants were randomly assigned to high-threat condition or a reduced-threat condition. In older adults, stereotype threat was induced/reduced by emphasizing/de-emphasizing the relevance of the test to examine memory capacity, whereas in younger adults, stereotype threat was induced/reduced by emphasizing/de-emphasizing the relevance of the test to examine intellectual abilities. Results show that stereotype threat may in part, be responsible for the “classic” gap observed between younger and older adults on memory tests. Practical implications for older adults’ memory assessment will be considered.  
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25: Machine Learning Classification of Brain Activity Reveals Unique Effects of Aging Stereotypes on Cognition

**Poster Session:** E  
**Presenter:** Ian M McDonough, The University of Alabama, Alabama Research Institute on Aging  
**Keywords:** Stereotype Threat, Beliefs about Aging, Neuroimaging: Functional, Episodic Memory, Working Memory  
**Abstract:** The activation of negative aging stereotypes – or stereotype threat – can impair memory in older adults, while positive stereotypes can boost performance (Barber & Mather, 2013; Meisner, 2012). Research suggests that the impact of stereotype activation can vary across individuals, and even some adults in “control” groups might feel threatened. Here, we developed a new method for investigating stereotype activation effects, using patterns of brain activity to classify each older individual’s mental state during working memory and episodic encoding tasks administered during fMRI. We first trained support vector machine algorithms to identify task-related brain patterns that differentiated the stereotype activation and control groups (on average) using a leave-one-out cross-validation procedure. Classifier confidence was then assessed from brain activity of untrained older adults into either category (stereotype activation-pattern vs. control-pattern), without knowing their actual group. This procedure was done separately for five brain networks representing different theoretical mechanisms underlying stereotype activation: increases in self-reflection via the default mode network and executive interference via cognitive control networks. We predicted that the neural stereotype activation signature would better predict cognitive performance than actual group membership (stereotype activation vs. control). We found that the stereotype activation neural signature within the executive frontal network predicted poorer recognition memory and that the neural signature within the cingulo-opercular network predicted poorer working memory. Both of these neural signatures better predicted performance than the stereotype activation category. This novel method reveals neural contributions of stereotype activation that helps understand the complicated underpinnings of this phenomenon.  
**Authors:**
26: Revisiting the Darkside of Context: Extending the Context Illusion on Memory to Older Adults  
**Poster Session:** E  
**Presenter:** Nicole E Miller, University of Chicago  
**Keywords:** Episodic Memory, False Memory, Context processing, Associative Binding  
**Abstract:** Context reinstatement is widely regarded as an adaptive memory process, as presenting the same context from encoding can serve as a strong retrieval cue at test, facilitating memory accuracy. However, Doss and Gallo (2018, Psychological Science) recently discovered a context reinstatement illusion, whereby presenting the same context (e.g., background scenes) between encoding and retrieval can distort memory for objects presented with the context. Here, we investigated the extent to which this effect is obtained in cognitively normal older adults. Using a modified version of the original task, participants viewed pictures of everyday objects (e.g., a cat) superimposed on background scenes (e.g., a beach). During retrieval, objects were presented with either a reinstated context (the same beach scene) or a switched context from encoding (e.g., a city scene). Participants were tested on their ability to discriminate studied objects (e.g., the studied cat) from similar but new objects (e.g., a different cat). Results indicated that context reinstatement significantly improved hit rates to studied objects, but also increased false alarm rates to similar objects, thereby replicating the context memory illusion. Critically, these effects were obtained in both younger and older adults, showing that the context illusion is intact with aging. We also investigated the extent to which levels of processing influences context-item binding with aging, and potential interactions with the context illusion. Altogether, these results demonstrated that older adults are equally susceptible to context-induced memory illusions as younger adults, even though age was associated with significant reductions in both object and context memory.  
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27: Interactive effect of Immediate Memory and Affective Symptoms on Physical Activity in Older Adults  
**Poster Session:** E  
**Presenter:** Lex Minto, Georgia State University  
**Keywords:** Emotion and Affect, Exercise and Fitness, Memory  
**Abstract:** Objective: Physical activity (PA) is related to decreased depressive symptoms and better neurocognitive performance in late life. However, many cross-sectional studies that investigated this relationship used self-report of PA. Research suggests that participants may inaccurately represent PA levels and that using objective measures of PA may help reduce the inconsistencies in the literature. We investigated the interrelationships between affective symptoms, immediate memory and PA as measured by pedometer in a diverse sample of older adults.  

Method: Participants included twenty-eight adults age 60 and older (mean age = 70.2; 82.1% Black; 85.7% female) who were administered the Digit Span Forward task, completed the self-report Short Form-36 (SF-36), and wore a pedometer for 14 days. Sex, education, race, and socioeconomic status were included
as covariates in a regression model in which Digit Span Forward and SF-36 Mental Component Summary (MCS) scores predicted PA level.

Results: Higher PA was associated with lower MCS scores. A significant three-way interaction between age, Digit Span Forward scores and MCS was also observed, such that in older adults, digit span scores were significantly and positively correlated with PA in individuals with lower MCS scores.

Conclusion: These findings are consistent with previous research showing that PA is beneficial for cognitive function. Findings further suggest that at older ages, higher affective symptoms might minimize the benefits of PA on immediate memory. Future studies with larger samples and that include an intervention component are needed to further clarify moderators of the impact of PA on cognitive functioning and mood.

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28: Age Differences in the Impact of Context on Emotion Discrimination

Poster Session: E
Presenter: Alyssa R Minton, DePaul University, Psychology Department, Western Kentucky University, Department of Psychological Sciences

Keywords: Emotion and Affect, Sensation and Perception, Person Perception

Abstract: Younger and older adults were asked to discriminate between negative emotional expressions that varied in facial cue similarity (e.g., anger/disgust for high similarity and fear/disgust for low similarity). Judgments were made under two experimental conditions. First, participants evaluated the emotional content of face stimuli with direct or averted eye gaze but absent background context. Then participants evaluated the emotional content of face stimuli presented in a congruent or incongruent context (i.e., evocative body language of target with an emotionally laden focal point). In the former condition, younger adults outperformed older adults when evaluating expressions with emotion cues high in similarity, but not when evaluating expressions with cues that were only moderately similar or less. Additionally, averted gaze expressions were more difficult for participants in both age groups to accurately judge. When background context was manipulated, both younger and older adults displayed superior emotion discrimination in congruent compared to incongruent contexts. However, discrimination performance declined for both age groups when the facial emotion cues were incongruent with those cues reflected in the background posture of the targets, especially when discriminating between facial emotions with highly similar cues. Younger and older adults were both susceptible to discrimination errors when the target’s eye gaze was averted away from the observer and toward the emotional focal point in the image. These findings suggest that context, when available, plays an important role in decoding facial expressions for both age groups, facilitating performance when congruent and hindering performance when incongruent.

Authors:
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29: Socioemotional Goals and Definitions of Emotion Terms: A Qualitative Analysis Across Age
Poster Session: E
Presenter: Irina Orlovsky, University of Massachusetts Amherst
Keywords: Emotion and Affect
Abstract: Major theories of adult development posit that knowledge about emotion might evolve across the lifespan. Socioemotional Selectivity Theory (SST) and the Strength and Vulnerability Integration (SAVI) models imply that the manner in which older (OA) and younger adults (YA) conceptualize emotions may differ in valence, arousal, reference to social partners, time perspective, and the self. Quantitative accounts of age differences in conceptualizations of emotion-terms offer mixed support for theoretical expectations, but many predictions have yet to be tested qualitatively. In this study, 90 OA and 210 YA provided narrative descriptions of 11 (5 positive, 6 negative) emotion-terms. Responses were coded on valence, reference to self/others, and arousal. O/YA used similar synonyms to define emotion-terms. As predicted, YA used high arousal language in their definitions of negative (OR = 10.29, p = 0.018) and positive terms more than OA (i.e. Happy: OR = 1.27, p<0.001); OA referenced other persons such as family and friends (pos: OR = 0.13, p<0.001; neg: OA = 0.32, p=0.002) more than YA. Contrary to predictions, OA self-referenced more often than YA in positive (OR = 0.12, p=0.001) and negative definitions (OR= 0.11, p=0.004); this may be attributed to OA providing more situational examples in their responses than YA. Somewhat consistent with SAVI and SST, OA may reference high-arousal states less when conceptualizing emotions and associate their definitions more with social partners than YA. Future research should address OA greater use of situational examples when defining emotion terms, motivational factors and emotional impact of these age differences.
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30: Context-dependent memory between e4 carriers and non-carriers
Poster Session: E
Presenter: Justin M Palmer, University of Arizona
Keywords: Memory, Context processing
Abstract: Distinguishing between highly similar objects requires the use of pattern separation or orthogonalizing information into distinct representations in the brain. Older adults generally perform worse on pattern separation tasks compared to younger adults by incorrectly identifying similar objects as ones seen previously. Therefore, older adults may have a decreased ability to create distinctive representations for objects with many overlapping features compared to younger adults. The background in which an object is placed can lead older adults to make even more similarity judgement errors. Older adults are more likely to make similarity errors when similar objects are embedded in a previously seen background. Our goal was to understand how the apolipoprotein (APOE) e4 allele moderates this effect. Participants were recruited from an existing pool. Older adults were screened to exclude cognitive impairment. APOE status was determined from saliva by the Translational Genomics Institute. Objects were embedded in semantically-related scenes and presented one at a time. Participants indicated whether the object was “new”, “similar”, or “same” compared to objects seen previously. Each object was either embedded in a repeated context, a new context, or on a white background. Behavioral performance was compared between e4 carriers and noncarriers. Preliminary results indicate that older e4 carriers and noncarriers do not differ on traditional recognition performance. However, older e4 carriers were less
likely to falsely recognize a similar object as a repeated object. The e4 allele may confer a memory benefit that moderates older adults’ susceptibility to rely on contextual familiarity, rather than object details.

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31: Social selectivity theory and age-related differences in social economic decision-making: Performance on the Ultimatum Game among Korean adults
Poster Session: E
Presenter: Sun Woo Park, Chungbuk National University
Keywords: Decision making, Cognitive Control, Emotion and Affect, Emotion Regulation
Abstract: This study examined the differences in social economic decision between the old and young. According to Carstensen's social selectivity theory (SST), as people get older, people try to maintain their emotion as positive in a way that spends more time with emotionally important people (i.e., close friends and family members), and regulate negative emotions. Therefore, SST predicts that if a proposer proposes an unfair offer in the Ultimatum Game, the older respondents are more likely to accept the offer than the younger respondents by regulating the anger felt at the proposer. In addition, compared to the young, the old respondents are more likely to accept the unfair offers proposed by the emotionally important people more than the unfair offers from the strangers.

Fifty-seven older adults and 60 university students participated in this study. Whether the offers were proposed by strangers or by emotionally important people, the old and the young respondents accepted most of the fair offers. In the case of the unfair offers, the old accepted the offers more than the young, and the difference in the acceptance rates between the old and the young was greater in the unfair offers proposed by the strangers than in those proposed by the emotionally important people. That is, even the young accepted 70% of unfair offers proposed by the emotionally important person, although the acceptance rate of the young was lower than that of the old. The present findings were discussed in terms of the generality of SST across different cultures.

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32: Hearing and visual acuity predict cognitive function in adults aged 45-85 years: Findings from the baseline wave of the Canadian Longitudinal Study of Aging (CLSA)
Poster Session: E
Presenter: Natalie A Phillips, Concordia University
Keywords: Sensation and Perception, Executive Function, Memory, Hearing Loss
Abstract: Aging affects multiple domains, including sensation, perception, and cognition. Importantly, there is a strong inter-relationship between cognitive function and both hearing and visual abilities and evidence has emerged showing that age-related sensory decline predicts cognitive decline and the
development of cognitive impairment leading to dementia. This study examined the relationship between hearing (pure-tone thresholds) and vision (pinhole-corrected visual acuity) and cognitive function (composite measures of executive function and memory) using baseline data from a population sample of 30,097 Canadian adults aged 45–85, participating in the Canadian Longitudinal Study of Aging (CLSA) Comprehensive cohort. Controlling for known covariates such sex, education, and socioeconomic status, we found that poorer hearing function was associated with poorer performance on the measures of executive function and memory and poorer vision function was associated with poorer performance on the measures of executive function. These associations were not simply a matter of people with poorer sensory function in a specific modality performing more poorly on tests dependent on that modality. Moreover, the negative association between hearing and cognitive function was greater for persons who were older, had lower income, or had more health conditions. This study contributes novel findings to the growing sensory-cognitive literature. We demonstrated meaningful sensory-cognitive associations in generally healthy adults (ranging from middle to late age) with relatively healthy sensory abilities. Our ability to consider hearing and vision jointly allowed us to compare the independent effects of each sensory modality on cognition whilst controlling for the other modality and a wealth of important covariates.

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33: Does semantic knowledge influence older adult’s ability to read and remember everyday activities?

Poster Session: E
Presenter: Barbara L Pitts, Kansas State University
Keywords: Everyday Memory, Semantic Memory
Abstract: Narratives, both in text and video, are made up of a series of events separated by event boundaries, which often correspond to important situational changes. People’s ability to identify event boundaries at encoding predicts later memory for the activity. Although this ability declines with age, semantic memory remains intact and may even increase with age. Here, we investigated how young and older adults use semantic knowledge to more efficiently read and later remember everyday events. Participants read a series of self-paced written narratives describing everyday activities that are generally more familiar to older adults (e.g., balancing a checkbook) and other activities that are generally more familiar to younger adults (e.g., setting up a video game console). Consistent with previous research using visual narratives, participants spent longer reading event boundaries than non-boundaries (i.e., the event boundary advantage). However, this effect did not hold when we accounted for the number of syllables in each phrase. Importantly, older adults performed better on memory measures when they had relevant, prior knowledge for activities compared to when they lacked the relevant knowledge, whereas younger adults did not show this knowledge-related memory effect. These results indicate that older adults use their intact knowledge to better remember new instances of everyday activities that they are familiar with. Future work will evaluate the extent to which patterns in reading time are associated with later text memory.

Authors:
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34: The effects of cardiovascular risks on task switching in healthy older adults: an fMRI study

Poster Session: E
Presenter: Shuo Qin, University of Texas at Dallas,
Keywords: Neuroimaging: Functional, Executive Function, Activity Engagement, Cognitive Control,
Abstract: In the current fMRI study, we examined the separate and the combined effects of two cardiovascular risk factors, arterial plasticity and physical fitness, on brain activation patterns during task switching in healthy older adults.

A hybrid design task switching paradigm (Basak et al., 2018; Nashiro et al., 2018) was used, allowing examination of both sustained (global switch cost, GSC) and transient (local switch cost, LSC) activations. Sixty older adults (Mage=70) were recruited for this study, and their data were compared to data from 28 younger adults (Mage=21). Arterial plasticity was measured by pulse pressure (systolic – diastolic blood pressure). Physical fitness was measured by metabolic equivalent (MET) of VO2Max. Older adults with low arterial plasticity and low MET showed reduced suppression of bilateral lingual gyrus, than those with lower cardiovascular risk for GSC. Older adults with low MET showed increased activation for GSC in the left inferior frontal gyrus (IFG) than those with high MET. Furthermore, increased GSC activations in the left IFG was associated with worse task performance in older adults. Older adults with 2 risk factors showed reduced suppression in lingual gyrus and increased left IFG activation compared to older adults with lesser number of risk factors (0 and 1).

Across all analyses, older adults with low cardiovascular risk (high plasticity, high fitness, and with 0 risk factor) showed similar activation patterns compared to younger adults. Such results suggested that high cardiovascular risk was associated with both maladaptive overactivation and exaggerated age-related differences in brain activations in older adults.

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35: Older Subjective Age Predicts Dementia-Related Anxiety

Poster Session: E
Presenter: Jennifer R Roberts, University of Colorado, Colorado Springs
Keywords: Subjective Age, Beliefs about Aging, Predictors
Abstract: Chronological age has been variably associated with dementia-related anxiety (DRA; Cutler, 2015; Bowen et al., 2019). As older subjective age (SA) relates to higher likelihood of dementia diagnoses (Stephan et al., 2017), it was hypothesized that older SA would also be associated with greater DRA. Results from two studies are reported. Study 1 participants (N = 2908; Mage = 38.15, SD = 12.78) completed a single item DRA measure. Study 2 participants (N = 85; Mage = 37.08, SD = 12.14) completed a 12-item DRA measure. Regressions were calculated to predict DRA based on age and SA across studies. Both regressions were significant [study 1: R2 = .004, F(2, 2905) = 5.51, p = .004; study 2: R2 = .33, F(2, 82) = 5.10, p = .008]. Chronological age was not a significant predictor of DRA across studies, whereas SA was (Study 1: beta = -.06, p = .001, Study 2: beta = -.34, p = .003). Study 2 participants grouped by SA (younger, same, older) were evaluated with one-way ANOVA for DRA differences, F(2, 82) = 3.51, p = .03.
Participants reporting older SA endorsed greater DRA (M = 2.64, SD = 1.11) than those reporting younger SA (M = 1.83, SD = 1.11; p = .01) but neither differed from those reporting equivalent subjective and chronological age (M = 2.18, SD = 0.96). Differences in SA may explain anxiety about cognitive impairment more effectively than chronological age alone; thus, future projects may benefit from the inclusion of SA.

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36: Training older adults’ decision-making ability.

Poster Session: E

Presenter: Alessia Rosi, Brain and Behavioral Sciences Department, University of Pavia, Pavia, Italy

Keywords: Decision making, Training, Metacognition, Strategy Use

Abstract: Decision making is a fundamental skill we use throughout our lifetime in order to make choices and maintain independent living. Previous studies found that some decision-making skills decrease with age. Despite these age-related declines, no study has yet investigated the possibility of promoting improvements in decision-making skills in older adults. We addressed this gap in literature by developing a new training to promote improvements in older adults’ performance in decision-making tasks. The training was based on the use of specific metacognitive principles and analytical strategies for promoting an analytical mode of thinking in the decision-making process.

Sixty-six older adults (age range 60-81) were assigned to one of the two groups: the metacognitive-strategy decision-making training group (n = 36) or the active control training group (n = 30) involved in a strategic memory intervention. Both training groups attended four 2-hour training sessions conducted once a week. We investigated the efficacy of the metacognitive-strategy decision-making training by using a target task that was practiced during the intervention, and a non-practiced task aimed to measure the generalization of participants’ behavior to new material.

Results showed that, after intervention, the decision-making training group improved its decision-making skills significantly more than the active control training group. Crucially, the positive effect of the training was evident in both practiced and non-practiced decision-making tasks. This is the first study showing that decision-making skills may be enhanced in healthy aging through an intervention using metacognitive principles and analytical strategies to promote an analytical mode of thinking.

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Poster Session: E

Presenter: Nasreen Sadeq, University of South Florida

Keywords: Assessment, Human Computer Interaction, Cognitive Testing

Abstract: Regular cognitive monitoring among older adults is a promising method for the early detection of cognitive decline. We used a sample of 158 older adults enrolled in a monthly cognitive monitoring study for up to five years to examine participant adherence and satisfaction with using the Cogstate Brief
Battery (CBB) - a computerized cognitive screening tool that measures speed, working memory, attention, and visual learning. We used a mixed methods approach to analyze quantitative data on study adherence (e.g., number of days participants needed to complete their assessment, number of reminders needed) and qualitative data about participants’ likes, dislikes, and suggestions for study improvement. On average, participants were 74.59 years old (SD=7.87), mostly female (n=109), had 16 years of education (SD=2.19), completed their monthly assessment within 4.02 days (SD=2.87) of receiving it, needed three reminder calls per year, and skipped one assessment per year. Participants who were higher in conscientiousness and married needed fewer days and fewer reminders to complete their assessments, while those with more subjective memory complaints and lower CBB performance needed more reminders and skipped more assessments. Most participants (87%) felt satisfied with the study and liked that the CBB was relatively easy and that their participation could potentially help others. However, some disliked that the working memory task was considerably more difficult than the others and thought the CBB tasks eventually became repetitive. Participants’ suggestions for increasing their satisfaction included providing them with individualized feedback about their performance and a greater variety of tasks.

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38: Older Adults Dual-Task Walking with Cognitive Load Manipulation: A fNIRS Study

Poster Session: E

Presenter: Talia Salzman, University of Ottawa

Keywords: Neuroimaging: Functional, Multi-Tasking, Executive Function, Working Memory, Cognitive Decline

Abstract: This study examined behavioural and cerebral oxygenation changes (ΔHbO2) in the prefrontal cortex (PFC) of older adults (OAs) using functional near infra-red spectroscopy (fNIRS) as they walked with four levels of cognitive load. In line with the CRUNCH hypothesis, as cognitive load increased, an HbO2 decrease was expected with behavioural performance declines. 20 healthy OAs (71.8 ± 6.4) completed four single cognitive (SC), single motor (SM) and dual-task (DT) blocks. The cognitive tasks included: simple reaction time (SRT), Go-no-Go (GNG), N-back (NBK) and Double number sequence (DNS). As the GNG involved inhibition and NBK and DNS working memory, significant differences were expected between these tasks. Behaviourally, SRT (393.99 ms) was significantly faster (p < .001) than the GNG (559.25 ms) and NBK (605.13 ms) tasks. Gait speed slowed significantly from SM (1.09 m/s) to DT (1.04 m/s; p = .014) but only in the DNS. Accuracy-wise, there was a main effect of task (p = .028), where SC (89%) was more accurate than DT (87%) and a main effect of difficulty (p < .001), such that SRT (100%) > GNG (92%) > NBK (81%) but NBK and DNS (80%) were not significantly different. In the PFC, there was a main effect of task (p = .047), in which there was a lower ΔHbO2 in DT (.028 μM) compared to SM (.078 μM). Findings partially support CRUNCH whereby working memory and inhibition tasks resulted in greater declines in behaviour while HbO2 demonstrated a drop when dual-tasking across all levels of load.

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39: Do Younger and Older Adults Know What They Know? A Study of Valenced Word Pairs and Picture Pairs

**Poster Session:** E

**Presenter:** Susie Shepardson, Emory University, University of Richmond

**Keywords:** Associative Memory, Metacognition, Emotion and Affect, Memory, Positivity Effect

**Abstract:** We examined age differences in associative memory and metacognition for positive, negative, and neutral word pairs and picture pairs. Participants studied 48 word pairs (Exp 1; n=40 YA, n=40 OA) or 48 picture pairs (Exp 2; n=40 YA, n=40 OA) for 3 sec per pair while asked to “think aloud” (verbalize while encoding pairs). Participants then completed yes-no item and associate recognition tests and, following each trial, gave memory confidence judgments (0% to 100%). Analyses of word recognition accuracy (hits minus false alarms) revealed main effects of age (YA > OA) and test type (associates > items). This “associative advantage” was observed in both age groups. Positive pairs were recognized at higher rates than neutral and negative pairs. Analyses of picture recognition accuracy revealed a main effect of age (YA > OA) and an associative deficit in OA for pairs relative to items. Memory for positive and negative pairs was comparable between YA and OA. In both experiments, metacognitive accuracy (gamma coefficients) was greater in YA than OA but did not vary by valence. Quality of mediator use was a significant predictor of associative word recognition in both age groups. These experiments provide mixed support for the associative deficit hypothesis (Naveh-Benjamin, 2000) and for metacognitive monitoring and mediator efficacy (Baker, Dunlosky, & Hertzog, 2010; Fox, Baldock, Freeman, & Berry, 2016), but no evidence for an age-related positivity effect for recognition memory (Carstensen, Isaacowitz, & Charles, 1999; Lucas & Allard, 2019). Theoretical and methodological implications will be discussed.

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40: Self-Conscious and Distracted: Interference and Facilitation Effects in Older Adults in the Stroop Task

**Poster Session:** E

**Presenter:** Brandy N Tiernan, University of the South

**Keywords:** Social Cognition, Emotion and Affect, Cognitive Control, Beliefs about Aging, Context processing

**Abstract:** We bombard senior adults with stereotypes and mischaracterizations of what it’s like to grow older. Over time we all begin to pathologize average cognitive decline to avoid social ostracism and other social consequences.

We used Kuhl and Kazen’s (1999) Stroop paradigm, which, in younger adults, eliminated the interference effect after the presentation of a positive prime word, compared to neutral or negative words. We successfully replicated the elimination of the Stroop effect in younger adults, and hoped, due to the SST and the positivity bias, we would see similar results for older adults. Our pilot data reveal typical age differences—unlike younger adults, older adults show interference after the presentation of a positive, negative, and neutral word. We also see a facilitation effect, with faster reaction times after positive words on congruent trials.

To get people to pay attention to the words, we tell them we will test their recall and recognition memory at the end of the task. Overall, older adults remember more words than younger adults. Together, the
facilitation effect and age differences in recall provide insight into older adults’ performance. Older participants change the task context and focus on remembering prime words to avoid stigma and shame associated with cognitive decline.

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41: Hippocampal Iron Relates to Integrity and Predicts Episodic Memory
Poster Session: E
Presenter: Anu Venkatesh, University of California, Riverside
Keywords: Diffusion Tensor Imaging, Hippocampus, Episodic Memory, Inflammation
Abstract: A number of studies have reported an age related increase in hippocampal iron deposition across the lifespan. While iron plays an important role in cellular function, excess accumulation and resulting oxidation may contribute to inflammation of glial cells and ultimately affect cognitive functioning. Here we will test the hypotheses that iron content in the hippocampus increases with age, is associated with declines in tissue integrity, and relates to episodic memory decline. In this study, 38 young (age 18-28) and 24 older (age 65-86) adults underwent Quantitative Susceptibility Mapping (QSM) to measure hippocampal iron content (R2*) and diffusion imaging to assess tissue integrity. They also completed the Rey Auditory Verbal Learning Task (RAVLT) to measure episodic memory. Independent sample t-tests revealed age-related declines in hippocampal integrity (increases in restricted, hindered, and free diffusion) and RAVLT immediate and delayed recall, but no age group difference for hippocampal iron content. However, independent of age, increased iron content was significantly correlated with increased restricted diffusion and worse episodic memory. In line with our predictions, these results suggest that iron accumulation in hippocampal gray matter negatively affects tissue integrity and ultimately episodic memory performance in cognitively normal adults across the lifespan. Finding these effects for restricted but not hindered or free diffusion is consistent with the notion that excessive iron is accompanied by inflammation of glial cells (astrocytes) within gray matter.

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42: Curiosity and activity engagement among older adults: implications for successful aging
Poster Session: E
Presenter: Sirui Wan, University of California, Irvine
Keywords: Activity Engagement, Health and Well Being, Emotion and Affect
Abstract: It has been proposed that curiosity plays an important role in maintaining cognitive function, mental health, and physical health in older adults, thus serving as a conduit for “successful aging.” Specifically, a few previous studies have found positive associations between curiosity and activity engagement among older adults, such that older adults reporting high levels of curiosity had higher levels of engagement in activities. Given that staying highly engaged in activities is usually found to be related to lower levels of depression and overall positive well-being among older adults, it is important to understand the role of curiosity in successful aging and the association between curiosity and activity engagement. Using a dataset with 189 retired healthy older adults (64-85 years old), however, we failed to obtain such a positive association between curiosity and activity engagement. We then summarized
the existing studies which have reported the relations between curiosity and activity engagement among older adults, and identified several potential issues with the conceptualizations and measurements of older adults’ curiosity and activity engagement in the current literature. We conclude that previous studies are potentially measuring different dimensions of curiosity, leaving it unclear how exactly older adults’ curiosity is related to activity engagement. Implications and future directions will be discussed.

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43: Task-relevant but not task-irrelevant emotion impacts response inhibition in younger and older adults
Poster Session: E
Presenter: Samantha E Williams, Department of Psychology, Saint Louis University
Keywords: Emotion and Affect, Executive Function
Abstract: To assess the impact of emotion and age on response inhibition, we conducted a series of three behavioral studies employing a Stop-Signal Task (SST) featuring faces (fearful, happy, neutral expressions) as Stop-signals. We predicted 1-emotional faces would evoke less efficient stopping compared to neutral faces across age groups, and 2-aging would adversely affect response inhibition. In study one, all faces served as Stop-signals, and age but not emotion impaired response inhibition; older adults were less efficient at stopping than younger adults. We theorized the lack of emotion effect was due to shallow stimulus processing. Studies two and three manipulated the SST instructions to encourage deeper processing of the faces as Stop-signals. Study two assigned gender as Stop-signals to encourage focus on facial features, while keeping emotion irrelevant to task instructions. Deeper stimulus processing did not change the pattern of emotion results, as younger and older adults performed similarly across emotion conditions, as well as compared to one another. Emotion being irrelevant to task instructions may explain the lack of emotion effects, and increased task difficulty in study two may explain the lack of age effect. Study three used facial expressions as Stop-signals to test if directly attending to emotion would impact response inhibition. In older adults happy faces facilitated response inhibition versus neutral and fearful faces while happy and neutral faces facilitated younger adults’ response inhibition versus fearful faces. Emotional features affect response inhibition only when relevant to a task, and these task-relevant effects may change with age.

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44: Effect of age and culture in Theory of Mind: UK and Malaysia
Poster Session: E
Presenter: Min Hooi Yong, Sunway University
Keywords: Social Cognition, Working Memory, Culture
Abstract: Age-related deficits in some cognitive functions also extend to social cognitive tasks such as recognising and understanding others’ mental states, also known as ‘Theory of Mind’ (ToM). Prior research has shown clear age-related impairments in ToM in both Western and Eastern samples, but no comparison of the age-effects across cultures. In this study, we tested the effects of culture (Western: Scotland, versus Eastern: Malaysia) on the aging of ToM using two tests which make differential demands on the more basic cognitive mechanisms (the false belief task) as opposed to the more pragmatic
societally-learnt social rules (the faux pas task). We predicted that the cultural differences may be greater in terms of aging effects on the faux pas task, which is more dependent on acquired knowledge about societies’ rules. In contrast, the aging effects might be more similar across two cultures on the false belief task, which is more dependent on the basic cognitive mechanisms influenced by aging. A total of 312 participants from UK and Malaysia completed faux pas task, false belief task, and working memory (WM) task. Results showed that the effect of age and culture were evident in the lie deception (false belief) and WM tasks, and effects of culture was significant in all faux pas and false belief tasks. Our findings suggest that in social understanding situations cultural differences may have contributed in developing relevant skills and is less dependent on cognitive capacity.

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45: Assessment of Older Adults’ Cognitive Functioning: Can Online-Tools Be a Reliable Alternative to Laboratory Testing?

Poster Session: E
Presenter: Sascha Zuber, University of Geneva
Keywords: Assessment, Cognitive Decline, Episodic Memory, Prospective Memory, Technology Adoption
Abstract: As the population ages, risks for cognitive decline threaten independence and quality of life for older adults. Fortunately, early signs of cognitive decline can often be detected long before important changes of cognitive functioning are noticed. Different psychological assessment tools have been developed to evaluate cognitive functioning. In particular, COGTEL represents a short but valid tool, allowing assessment of performance on different key domains, such as retrospective memory, verbal fluency and reasoning. In addition, Prospective Memory (PM) tasks are frequently administered, as PM abilities typically relate to autonomy, personal well-being and overall cognitive functioning. Classically, these tools are administered in face-to-face laboratory sessions, which is time- and resource-consuming. With the aim of reducing such costs, previous projects administered the COGTEL via telephone. Following up on this and extending the effort to reduce assessment costs, the present study set out to develop and validate two new online tools, allowing a rapid assessment of general cognitive abilities and of PM abilities.

Data collection is ongoing and planned for 150 participants aged 50 years and older. Results will examine whether performance assessed via these newly developed online tools is comparable to results obtained in a controlled face-to-face laboratory setting. If such were the case, these online tools would have the advantage of 1) reducing the cost of reliably measuring older adults’ cognitive functioning, 2) allowing to reach a broader population as they can be administered from far, and thereby 3) help detect individuals potentially at risk of developing age-related cognitive disorders.

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46: Emotion regulation across adulthood in daily life and lab contexts

Poster Session: E
Abstract: The aim of this talk is to examine whether there are age-related differences in the emotion regulation strategies individuals spontaneously deploy. In Study 1 married couples (aged 23-85 years) reported their daily use of strategies spanning the process model of emotion regulation for nine days. No age-related differences emerged for any strategy. In Study 2 a diverse sample of community members (aged 25-83) reported their use of a wide range of strategies after being instructed to regulate in a pro-hedonic fashion while watching emotion-inducing films. Some age-related differences emerged when regulating sadness, but not disgust. Specifically, relatively older adults used less distraction and more acceptance. There was no age difference in the emotional impact of regulation during this task. The findings generally suggest there may be more similarity than differences in emotion regulation strategy selection across age groups.

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47: Age Differences in Stress, Incidental Emotion Regulation, and Emotional Adjustment to Cancer

Poster Session: E

Presenter: Dr. Bruna Martins-Klein, University of Massachusetts-Amherst

Keywords: Emotion and Affect, Strategy Use, Stress, Communication, Context Processing

Abstract: Cancer-related stress is common and can negatively impact the physical and psychological well-being of patients. Older adults are at higher risk for developing cancer, yet little research has explored age-differences in cancer-related stress. This study investigated stress following diagnosis and cancer treatment across age. Patients (N= 147, aged 27-88) recruited from VA tumor registries answered open-ended questions regarding stress 6-months following cancer diagnosis (T1), treatment-related stress at 12-months post-diagnosis (T2), and emotional distress at T2. Reported sources of stress were coded into themes, relative frequencies, and age differences were explored. Results revealed decreased stress associated with uncertainty, social stress, and situational stress for older than younger adults. Interestingly, older adults made more spontaneous references to emotion regulation (ER) when discussing sources of stress. Reported stress and concurrent ER was associated with better emotional outcomes. Incidental ER may be key to resilience and positive adjustment to cancer.

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48: Cross-hemispheric Connectivity Benefits Cognition in Normal Aging

Poster Session: E

Presenter: Simon W Davis, Duke University

Keywords: Neuroimaging: Functional, Memory, Functional Connectivity, Neurovascular Coupling

Abstract: The left and right cerebral hemispheres collaborate to complete complex cognitive tasks and healthy older adults often take advantage of this mechanism to offset the deleterious effects of aging. Bilateral patterns of fMRI and EEG activity are often associated with increases in memory and attention, suggesting a compensatory mechanism; however, under different task conditions, these patterns have also been seen to relate to decreases in performance, suggesting a lack of contralateral inhibition. Thus,
a central question in the neurocognition of aging is: what is the benefit of bilateral brain interactions in PFC? Relating bilateral activity with performance provides some evidence for either view, but these approaches are inherently correlational. Here we use neuroimaging and neurophysiology in combination with bilateral TMS delivered online to PFC during a memory task. We find that 1) bilateral structural connections in the PFC play a strong role in measures of both crystallized and fluid intelligence (e.g., working memory); 2) bilateral brain stimulation via TMS, increased functional connectivity between frontal regions, and that this connectivity was 3) predictive of episodic memory success, and 4) mediated by the structural connectivity between the hemispheres. Furthermore, these effects were frequency-specific, with disruption of episodic memory performance in bilateral alpha, but not beta stimulation. This work helps to confirm the hypothesis that bilateral connectivity patterns support cognition in older adults, and suggest specific neurophysiological correlates of this effect.

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49: Interpreting BOLD across the lifespan: Challenges and perspectives
**Poster Session:** E
**Presenter:** Kamen Tsvetanov, University of Cambridge
**Keywords:** Neuroimaging: Functional, Memory, Functional Connectivity, Neurovascular Coupling
**Abstract:** The preservation of cognitive function is critical for well-being across the lifespan and requires homeostatic and resilient systems of brain function. Previous research on neurocognitive aging, traditionally based on blood-oxygenation level-dependent (BOLD) fMRI signal, provides a partial understanding of these systems due to methodological and conceptual limitations. On a methodological level, common approaches to the analysis of fMRI BOLD data are confounded by age-related changes in neurovascular signalling. On a conceptual level, previous studies have typically separated the evaluation of differences in activity of focal brain regions from differences in the interactions between them. In this talk, we will demonstrate examples of recent developments on both levels that aim to refine current approaches and traditional interpretation of fMRI BOLD signal. To demonstrate that findings generalize across multiple cognitive states we used data from the population-based lifespan Cam-CAN cohort (N = 120 – 635; age range, 18-88 years). These developments provide a rich description of the brain’s dynamic repertoire across the lifespan with implications for our understanding of the influence of neurovascular health on the normal process of individual differences, ageing and neurodegenerative disorders.

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50: Aging-Related Changes in Association between Affect and Response Time Inconsistency
**Poster Session:** E
**Presenter:** Eric S Cerino, Pennsylvania State University
**Keywords:** Intraindividual Variability, Emotion and Affect, Lifestyle Correlates, Attention, Methods
Abstract: Identifying early indicators of age-related cognitive decline and pathological impairment is crucial in informing approaches to optimizing cognitive health and reducing decline. Negative affect (NA) and positive affect (PA) are established modifiable psychosocial correlates of cognitive health and have demonstrated capacity for meaningful within-person fluctuations based on person-environment interactions, age, and measurement approach. Previous research has shown NA is associated with increased response time inconsistency (RTI), an early performance-based indicator of cognitive health and aging. It is unclear, however, whether PA is associated with RTI, and whether affect-RTI associations exist within persons over time or change as individuals get older. We employed an intraindividual variability approach utilizing data from a measurement burst study to explore within- and between-person associations between affect and RTI in community-dwelling older adults (N=111, M=80.04 years, SD=6.30). Affect and RTI were assessed on six days over a two-week period, every six months for two years. Results revealed a significant association between NA and RTI within persons over time. RTI was higher on sessions when NA was higher than usual (b=0.22, SE=.07, p<.01). This association decreased in magnitude over time (b=-0.09, SE=.03, p<.001), ultimately resulting in increased NA being associated with decreased RTI two years later (b=-.14, SE=.07, p<.05). No PA-RTI associations emerged. Results suggest efforts focused on maximizing resource allocation and personalizing cognitive health efforts should consider for whom and when mitigating NA may be maximally beneficial for experiencing cognitively sharper days and prompting lifestyles that prioritize cognitive health.

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Poster Session: E

Presenter: Robert S Stawski, Oregon State University

Keywords: Intraindividual Variability, Emotion and Affect, Lifestyle Correlates, Attention, Methods

Abstract: Trial-to-trial variability in response times, response time inconsistency (RTI), reflects both transient (e.g., processing efficiency) and more durable (e.g., central nervous system integrity) characteristics of cognitive health, status and function. Despite increasing interest in RTI, no systematic comparisons have explored the distribution of variability in RTI (i.e., within- vs. between-persons), nor examined RTI-attention switching associations as a function of cognitive status. Using a measurement burst design, we aimed to address three research questions. First, does RTI exhibit both within- and between-person variation. Second, is variation in RTI associated with attention switching performance. Finally, do RTI-attention switching associations differ as a function of cognitive status. A sample of 302 adults (age 62-94) completed a 4-choice RT task weekly for 4-5 weeks, with this protocol repeated annually for 4 years. Cognitive status was determined according to the cognitively-impaired-not-demented (CIND) classification, where those who performed 1SD or more below average on one or more standard neuropsychological tests were considered cognitively impaired. Preliminary results using multilevel modeling revealed three findings. First, RTI varied significantly both within-persons and between-persons but was disproportionately stable among cognitively compromised individuals. Second, both within- and between-persons, increased RTI was associated with decreased attention switching performance among cognitively compromised, but not cognitively intact older adults. Finally, slower average RT was associated with decreased attention switching performance, but primarily for cognitively intact older adults. Taken together, RTI reflects both transient and durable characteristics of individuals’ cognitive health and function and is uniquely predictive of cognitive performance among cognitively compromised older adults.
Poster Session F

1: Metacognitive IT-tools: Innovating training procedures for promoting active and engaged aging

**Poster Session:** F
**Presenter:** Erika Borella, Department of General Psychology - University of Padova, Italy, Civitas Vitae Research Centre, Opera Immacolata Concezione -OIC- Onlus Padova, Italy
**Keywords:** Training, Technology Adoption
**Abstract:** The focus of growing aging research is to develop cognitive interventions capable of supporting older adults’ cognitive functioning. Targeting cognitive functioning alone might not be enough, however, for ensuring training efficacy. It is well documented that older adults might develop inappropriate beliefs concerning their cognitive resources (metacognitive factors), which lower their confidence in their cognitive skills and lead, in turn, to a shift towards negative attitudes, less motivation and a tendency to avoid challenging cognitive activities (motivational factors), such as the case of a cognitive intervention. This ongoing project aims thus to assess the feasibility of combining the training of cognitive abilities that are sensitive to aging (e.g., memory, processing speed, visuo-spatial abilities) with the promotion of older adults’ engagement in situations that might be “cognitively challenging”. Taking advantage from new technologies, such a combined intervention will be computer-based: participants aged 50 and over will complete a multi-domain training program after having attended video-recorded psychoeducational sessions aiming to: i) nurturing awareness of their cognitive functioning, also by eradicating their misconception and stereotypes about aging (metacognitive factors); ii) improving confidence in their skills; and iii) promoting a positive attitude and motivation to engage in “cognitively challenging” tasks (motivational factors). Short- and long-term training benefits will be assessed using a battery of cognitive, metacognitive-motivational, and everyday functioning measures, to understand whether such a new combined program might not only promote longer lasting benefits from a cognitive point of view, but also broadly facilitate an engaged lifestyle, crucial to active aging.

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2: Lack of cognitive benefit to twelve weeks of physical activity promotion among community-dwelling African Americans: Program for African American Cognition and Exercise (PAACE)

**Poster Session:** F
**Presenter:** Owen T Carmichael, Pennington Biomedical Research Center
**Keywords:** Exercise and Fitness, Activity Engagement, Interventions, Health and Well Being
**Abstract:** Interventions that increase physical activity (PA) engagement among cognitively healthy older adults have been reported to provide cognitive benefits, but these interventions have largely not included
substantial representation of African Americans. The Program for African American Cognition and Exercise (PAACE) randomized 56 sedentary African American adults in the Baton Rouge, Louisiana area (mean age +/- s.d.: 69.2 +/- 3.4 years) to a 12-week PA promotion program or 12-week educational program. The PA program, aiming to increase moderate to vigorous PA to national guideline levels, provided supervised PA 2 days per week (90-120 minutes/week) at local YMCAs along with 30-60 minutes/week of home-based PA. The control group completed 12 60 minute educational sessions on successful aging. The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) was assessed before and after the intervention. Groups were well matched by age, sex, BMI, employment, education, and income. In ANOVA models, the control group significantly increased scores on the RBANS overall scale and scales of visuospatial function, immediate memory, and delayed memory, along with the story memory, figure copying, coding, and figure recall sub-scales (all p<.05). The physical activity group significantly increased scores on only the list learning sub-scale (p=.047). Scores on the overall scale (p=.034) and story memory sub-scale (p=.0008) increased significantly more in the control group than in the PA group. Possible contributors to these results include inadequate duration or intensity of PA stimulus; beneficial health behavior changes or cognitive stimulation in the control group; and practice effects in the control group.

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3: Effects of Resistance Exercise Training on Cognitive Function in Older Chinese Americans: A Randomized Controlled Trial

Poster Session: F
Presenter: Mei-Lan Chen, School of Nursing, Georgia State University
Keywords: Exercise and Fitness, Cognitive Impairment, Executive Function, Attention, Memory
Abstract: Physical activity interventions have shown to be potentially effective for preventing cognitive impairments or mitigating cognitive decline in older adults. However, few studies assessed the effect of resistance exercise on cognition in older Chinese Americans. The purpose of this study was to examine the effects of a 12-week resistance exercise intervention (50 minutes per session, 2 times per week) on improving cognitive function in community-dwelling older Chinese Americans. The study was a two-group randomized controlled trial with pre-test/post-test design. Thirty older adults (mean age 77.9 ± 5.0 years) were randomly assigned into the resistance exercise intervention group or the wait-list control group (15 participants in each group). Seven cognitive domains were evaluated using the Montreal Cognitive Assessment at baseline and 12 weeks. The results showed that the resistance exercise intervention group had significant improvements in cognitive performance after receiving the 12-week resistance exercise training. At pre-test, there was not a significant difference on cognitive function between the intervention and the control groups, but there was a significant difference between the two groups on cognitive performance at the end of the trial. Older adults participated in resistance exercise program had greater improvements in executive functions, attention, language, and orientation domains than their control counterparts at post-test. However, there were no significant differences between both groups on naming, abstraction, and delayed recall domains at post-test. The study findings suggest that resistance exercise training has a positive effect in improving cognitive function in older adults.
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4: Cognitive Reserve Moderates the Executive Dysfunction associated with Parkinson’s Disease
Poster Session: F
Presenter: Vanessa T Cleary, University of New Hampshire
Keywords: Parkinson's Disease, Cognitive Reserve, Executive Function
Abstract: Parkinson’s disease (PD) is an age-related neurodegenerative disorder predominantly impacting executive functioning (EF), often progressing to dementia. Dementia onset may be masked by cognitive reserve (CR), and neuropsychological evaluations neglecting to acknowledge this may fail to identify cognitive decline in this population. We hypothesized that highly educated individuals with PD would perform better on a commonly used neuropsychological test of EF. We also hypothesized that tests such as the Delis-Kaplan Executive Function System (D-KEFS), although comprehensive, would not be sensitive to executive dysfunction in highly educated individuals with PD. Thirty-four PD participants were matched with 21 healthy controls (HC) based on age, education and sex. Overall participants were 66.8 years old (SD=7.6) and had a minimum of 16 years of education. All participants were administered the D-KEFS, which is a measure of EF, using nine separate subtests. One-sample t-tests were used to examine differences between PD participants and age appropriate nationally representative normative data. The PD group performed significantly better (i.e. p-values <.05) across all subtests. Independent-samples t-tests performed on PD and HC raw scores revealed that the groups were similar on seven of the nine subtests (i.e. p-values >.05). It is well-established that PD is associated with executive dysfunction. However, we found that highly educated individuals with PD performed better than average on a comprehensive measure of EF, suggesting that CR moderated the expected executive dysfunction. Additionally, we found that several commonly used clinical measures of EF are insensitive to these deficits in PD.

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5: Mechanisms underlying cognitive-motor dual-task improvements following cognitive or physical training in healthy older adults
Poster Session: F
Presenter: Rachel Downey, PERFORM Centre, Concordia University, Montréal, Québec
Keywords: Interventions, Cognitive Decline, Multi-Tasking, Executive Function
Abstract: Walking while simultaneously performing a cognitive task (dual-tasking) predicts falls risk and cognitive impairment in older adults. While dual-task performance can improve following cognitive or physical training, less is known about what mechanisms underlie these training-related improvements. Additionally, it is unclear how individual differences in cognitive functioning predicts change in dual-task performance following training. To investigate this, thirty-three healthy older adults were randomized to
one of three training arms: Cognitive (COG) = 9, Aerobic (AE) = 11, Motoric (GMA) = 13 (12 weeks; 1 hour, 3 x/week). Single and dual-task performance (gait speed, m/s; cognitive accuracy, %) was evaluated before and after training, using the 2-back task as a concurrent cognitive load. Cardiorespiratory fitness (VO2peak), energetic cost of walking (ECW), and executive function (Stroop) was assessed before and after training as potential mechanisms underlying training gains. Compared to baseline levels, dual-task cognitive accuracy improved (d = 0.51). Individuals with lower baseline cognitive status (MoCA) showed greater improvements in cognitive accuracy dual-task costs. There were no dual-task differences across training groups. We expect that improvements in dual-task performance will correlate most strongly with improvements in VO2peak following AE training, ECW following GMA training, and Stroop following COG training. Together, our results suggest that regardless of the type of intervention, training can improve cognitive dual-task performance, and may be particularly beneficial to individuals with poorer cognitive functioning. Understanding what mechanisms underlie these changes will be important for advancing the development of intervention programs to improve the quality of lives of older adults.

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6: Can music enhance source memory and confidence for new information in young adults and healthy older adults?

Poster Session: F
Presenter: Alyse Finch, Texas State University
Keywords: Memory, Implicit Learning
Abstract: As the average lifespan increases in our society, so does the incidence of age-related memory dysfunction. Recent research has highlighted that one potentially effective way to reduce memory decline is to pair new, to-be-learned, information with music. This strategy, known as musical mnemonics, can lead to better memory in young adults, healthy older adults, and patients with Alzheimer’s disease, but the limitations of musical mnemonics have not been fully explored. The goal of this study is to further explore the efficacy of musical mnemonics as well as its effect on memorial confidence. In the current study, we examined both implicit memory, using the mere exposure effect, and explicit memory, using a source memory judgment, for novel sung lyrics compared to spoken lyrics in young adults and healthy older adults. In addition to the memory judgments, participants were also asked to rate their confidence in their memory performance. We found that while explicit source memory did not appear to be significantly enhanced by the musical pairing, confidence was greater for memory judgments of sung lyrics compared to spoken lyrics. These findings suggest that pairing new information with music may not always lead to improved memory performance, but that there may be meta-cognitive differences related to memory for musically encoded information.

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7: Association between Perceived Stigma and Discussion of Experiences in Parkinson’s Disease: Findings from an Online Survey
Poster Session: F
Presenter: Joshua T Fox-Fuller, Boston University,
Keywords: Parkinson's Disease, Stigma
Abstract: Objective: Perceived stigma is common in persons with Parkinson’s disease (PwPD), but their willingness to openly endorse and discuss stigma is mainly unknown. We conducted a large online survey that examined stigma perception with questionnaires. Additionally, we measured response rate and length on free response questions (FRQs) about the challenges faced by PwPD and their advice to those impacted by the disease.

Methods: 304 PwPD (144 men, 160 women; mean age 64.9 [SD 8.8 years]) responded to four stigma scales (Parkinson’s Disease Questionnaire-39 stigma items; Stigma Scale for Chronic Illness; Mental Health Consumers’ Experience of Stigma; Stigmatization Scale) and five FRQs. Correlations assessed relations between stigma scales and a stigma composite (composed by summing participants’ z scores of the four stigma scales), as well as between the stigma composite and age, FRQ response rate (#questions answered), and FRQ length (#words).

Results: 93% of the sample answered at least one FRQ. Stigma scale scores and the composite were moderately-to-strongly intercorrelated, and the stigma composite negatively correlated with age (r=-.31, p<.001). FRQ length correlated positively with the stigma composite (r=+.15, p=.007) and negatively with age (r=-.30, p<.001). There was a trend between FRQ response rate and the stigma composite (p=.10, p=.074).

Conclusions: On an anonymous online survey, PwPD endorsed stigma and discussed their experiences. Those perceiving greater stigma – especially younger PwPD – were more likely to discuss their experiences at length. PwPD may discuss stigmatizing experiences more freely using online tools – an opportunity that should be studied further in healthcare and research settings.

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8: The Intervention Factory: Exploring Community-Based Activities as Interventions for Cognitive Ageing
Poster Session: F
Presenter: Alan J Gow, Heriot-Watt University
Keywords: Activity Engagement, Cognitive Decline, Interventions
Abstract: Keeping mentally, socially and physically engaged have all been proposed as potentially protective against age-associated cognitive decline. These factors have been incorporated in interventions for cognitive ageing, though are often developed and tested in lab-based settings that may not translate to ‘real world’ environments. Studies examining activity-based interventions have suggested novelty of the experience for the individual and active engagement might be required for specific cognitive benefits.
The Intervention Factory is exploring existing community-based activities and learning programmes as potential interventions to reduce cognitive ageing. Participants aged 65 and older completed baseline cognitive, physical and psychological assessments. A pseudo-randomisation procedure allocated them to one of five novel community-based activities, varying in levels of mental, social and physical engagement, for example: computer classes (predominately mental), language classes (mixed intellectual-social), exercise (predominantly physical/mixed physical/social), creative (mixed mental/physical), social groups (predominantly social), plus a no contact control group. Participants completed their allocated activity for about 10 weeks, approximately 2 hours per week, before returning for follow-up assessments. To August 2019, 303 participants had been recruited and completed baseline assessments across 7 cohorts, with 267 returning for follow-up assessments; a final cohort are to complete the study by February 2020. The presentation will therefore explore associations between activity allocation and changes in cognitive domain scores (including verbal comprehension, perceptual reasoning, working memory and processing speed) for about 300 individuals. Analyses will consider the mental, social and physical engagement contributors to any intervention-associated benefits.

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9: Revisiting Classical Assumptions about Cognitive Aging by Means of Innovative and real-life Methods in Prospective Memory Research
Poster Session: F
Presenter: Maximilian Haas, University of Geneva
Keywords: Prospective Memory, Everyday Memory, Technology Adoption, Assessment, Longitudinal
Abstract: Around the turn of the millennium, the so-called “age – prospective memory paradox” was revealed – a phenomenon comparing prospective memory (PM) performance in and outside the lab that has challenged the classical assumption that older adults necessarily evidence a marked decline in PM functioning. The present contribution intends to tie in with existing research using established naturalistic PM tasks, and to extend it through use of emerging technologies – such as the Electronically Activated Recorder (EAR; Mehl, 2017) or the use of smart sensor systems – that may provide novel insights into cognitive aging. In a first study, 60 young adults and 45 older adults completed three measures with different levels of ecological validity (experimenter-given task, self-assigned intention diary, EAR) over the course of nine days in a fully counterbalanced design. In a second and ongoing study, traditional laboratory measures of a population of younger and older adults will be contrasted to an unobtrusive assessment of everyday PM and daily cognitive functioning with a multi-method approach including smart sensor technology. Results deriving from the assessment with the EAR to detect spontaneous speech production related to memory and everyday memory failures underpin an age-related benefit in real-life PM that joins with results from existing PM research. Extending the field by the use of innovative and unobtrusive measures through sensor technology is to be considered promising for research in cognitive aging.

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10: Differentiating Parkinson’s Subtypes Using Motor Cognitive Assessments
Poster Session: F
**Presenter:** Kayla Hamilton, Emory University  
**Keywords:** Motor Skills, Cognitive Impairment, Parkinson's Disease, Interventions  
**Abstract:** Background and Aims: Parkinson's disease (PD) can be classified into two distinct phenotypes, tremor dominant (TD) or postural instability and gait difficulty (PIGD). Those classified as PIGD subtype are more susceptible to severe cognitive decline and dementia. Differentiation in the diagnosis of PD would allow for early treatment and preventative care. PD motor symptoms are often worsened by dual motor and cognitive paradigms likely as a result of the overlapping neural symptoms for both cognitive and motor functions. Clinical assessments that require the use of motor planning, initiation, and coordination may reveal neural deficits that are necessary for dividing attention between mental processing and postural control. The objective of this research project is to assess if motor-cognitive assessments, the four-square step test (FSST), body position spatial task (BPST) and Timed up and go-cognitive (TUG-C) can differentiate PD subtypes in older adults.

**Methods:** We performed a cross-sectional study analysis with individuals diagnosed with PD (n=116). Blinded raters assessed participants with the), and motor-cognitive assessments: FSST, BPST, and Timed “Up and Go” – Cognitive (TUG-C). Participants were classified as either TD or PIGD subtypes based on Movement Disorders Society Unified Parkinson Disease Rating scale revision (MDS-UPDRS) scores. Differences between TD and PIGD groups were assessed with univariate analyses. A receiver operating characteristic (ROC) curve analysis was used to investigate the ability of motor-cognitive exams to predict PD subtype.

**Results:** Patients with PIGD phenotype performed worse on all motor-cognitive assessments compared to patients with TD phenotype. In a combined model incorporating TUG-C, BPST, the area under the curve (AUC) was .66, and discriminative ability sensitivity was .84. Individually, BPST Trials was the most sensitive (sen=.71), while TUG-C was the most specific (Spe=.82).

**Conclusion:** BPST, FSST, and TUG-C are brief motor-cognitive assessments that require minimal time to administer and can accurately differentiate between PD subtypes. BPST and TUG-C may be useful when differentiating PD subtypes in a clinical setting when performing the MDS-UPDRS is not possible. Combined assessment using the BPST and TUG-C may improve diagnostic ability. Early diagnosis of PD subtypes might identify those who need early physical therapy and cognitive interventions.

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11: Investigating adherence to technology-based cognitive interventions with the potential to slow or reverse cognitive decline associated with aging  
**Poster Session:** F  
**Presenter:** Erin R Harrell, Florida State University, University of Alabama  
**Keywords:** Cognitive Decline, Decision making, Interventions, Strategy Use, Technology Adoption  
**Abstract:** The aim of this study was to determine the effectiveness of two theory-based strategies to promote cognitive training adherence among older adults over an extended period. Strategies either incorporated elements of implementation intentions or positive message framing, both of which have been found to promote adherence to health-behaviors in other domains. Participants were asked to engage in technology-based cognitive training at home comprised of seven neuropsychological tasks that
were gamified (the Mind Frontiers software program) while adherence was monitored across two phases. The primary focus of this presentation is Phase 1. In Phase 1 (structured), participants were provided with a recommended adherence schedule that required them to engage in an hour of cognitive training for five days out of the week over two months. In Phase 2 (unstructured), participants were allowed to engage in as little or as much training as they wanted for one month. In general, adherence was adequate, but large variability was observed. Contrary to expectations, neither the implementation intention nor the positive message framing produced greater adherence compared to a control group. Individual difference predictors of adherence did not predict adherence over Phase 1 either. Results confirm that adherence is a challenge within this domain as well, and that adherence can be challenging to improve and predict. Phase 2 will examine whether any benefits might be observed when participants were given more freedom to determine their own level of intervention engagement.

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12: Remembering intentions in younger and older adults: Do associative demands matter?
Posters Session: F
Presenter: Alexandra Hering, University of Geneva, Switzerland
Keywords: Prospective Memory, Associative Binding, Memory
Abstract: Prospective memory describes the ability to remember delayed intentions. To do so, we have to encode the intended action together with the appropriate moment (i.e., prospective memory target) when to execute the action. The association between target and action can be high and result in spontaneous intention retrieval, or low and demand more strategic intention retrieval. We assumed that these differences in associative demands could explain age differences in prospective memory performance between younger and older adults. Twenty-six younger and 26 older healthy adults worked on a two-back picture task as ongoing activity with an embedded prospective memory instruction. At the beginning of each block, participants had to encode two prospective memory targets and respective action-words. The target-action word pairs varied in their lexical association being highly associated or not. When detecting the prospective memory target, participants had to press a key and then they were prompted to recall the intended action-word. We investigated the influence of the target-action association on target detection as well as intention retrieval. First preliminary results show age differences depending on the association condition for retrieving the intention (i.e., correctly recalling the action words). The results suggest that the binding between the prospective memory targets and the intended actions influence prospective remembering in older adults. The findings are discussed in light of theories of intention retrieval in prospective memory and binding mechanisms in episodic memory in older age.
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13: Health Behaviors and Their Impact on Self-Reported Cognitive Impairment, Domains of Daily Function, and Resultant Quality of Life
**Poster Session:** F

**Presenter:** Sarah Hubner, University of Nebraska Omaha

**Keywords:** Cognitive Impairment, Quality of Life, Lifestyle Correlates, Health and Well Being, Dementia

**Abstract:** Modifiable health behaviors may impact the risk of cognitive decline and subsequent quality of life (QOL). Relationships between cognitive decline, modifiable health behaviors (i.e., tobacco/alcohol consumption, BMI, exercise), and QOL (e.g., self-rated health indicators) were examined utilizing the Behavioral Risk Factor Surveillance System. Cognitive decline was based on self-reported presence of memory impairment. Questions assessing QOL also included cognition-based interference with IADLs/social activity and frequency of need for assistance. Respondents were aged 45 and older. The weighted majority were white (67%) and female (52%). Demographic variables were included as covariates. The binary logistic regression included participants who reported yes/no for cognitive impairment and had valid responses for all other non-cognitive variables of interest (unweighted n=29,734; weighted n=22,624,224). Results revealed that lower self-reported mental and physical health, smoking history, obesity, inactivity, and heavy alcohol consumption were positively associated with self-reported cognitive impairment (all p’s<.001). Multinomial logistic regressions included participants who had valid responses for IADL/social activity interference, need for assistance, and all other non-cognitive variables of interest (unweighted n=3,001; weighted n=2,295,301). Results indicated that lower self-reported health and inactivity were positively associated with increasing burden in the domains of IADL/social activity interference and need for assistance (all p’s<.001). Being underweight/overweight/obese and occasional smoking was associated with the greatest burden (all p’s<.001) in the various QOL domains. These results suggest that modifiable health behaviors and self-reported mental and physical health significantly modify cognitive decline, and although more varied, have a similar effect on resultant QOL; this may inform future research and interventions.

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14: How Do Individual Differences in Stress, Personality, and Cognitive Ability Relate to the Experience of Stress in Everyday Life?

**Poster Session:** F

**Presenter:** MacKenzie L Hughes, Georgia Institute of Technology

**Keywords:** Stress, Ecological Momentary Assessment, Physiological Arousal, Cognition, Personality

**Abstract:** While previous research has found age, perceived stress, neuroticism, and cognitive ability to influence reported daily stress exposure and perceived stressor severity, less is known about how these measures relate to physiological indicators of arousal. A cross-sectional sample of adults completed the following individual differences measures: Perceived Stress Scale, Perceived Stress Reactivity Scale, Big Five Inventory, and six measures of cognitive ability (i.e., digit symbols, advanced vocabulary, letter sets, category fluency, number series, and size judgment span). Using palm pilots, participants were randomly prompted five times per day for 10 consecutive days to complete short surveys pertaining to their experiences with daily stress. If a participant indicated that they had experienced a stressful event on the palm pilot, additional information related to their experience was collected, including their rated severity of the stressor. During the same 10-day period, participants provided seven saliva samples throughout each day: once upon awakening, 30-minutes post-awakening, and five additional times corresponding to the palm pilot surveys. Saliva samples were assayed for cortisol and alpha-amylase. We will summarize the influences age, personality, and cognitive ability have on perceived stress and perceived stress.
reactivity. We will also discuss how the individual differences measures relate to repeated assessment of daily stressor exposure and severity as well as cortisol and alpha-amylase. Results will provide further insights into the complex relationships between perceived stress as indicated by self-report questionnaires, the experience of stress exposure in everyday life, and stress observed on a physiological level.

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15: The Effects of Everyday Reading Engagement on Cognitive Abilities in Older Adults

**Poster Session:** F

**Presenter:** Sueyoun Hwang, Beckman Institute, University of Illinois

**Keywords:** Activity Engagement, Cognitive Reserve, Language Comprehension, Interventions, Working Memory

**Abstract:** While literacy is often believed to have beneficial effects on cognitive function, there is a lack of empirical evidence to support a causal relationship. To examine the effects of sustained reading activities on late-life cognition, we contrasted the effects of sustained reading engagement against an active control among older community-dwelling adults (N=71, MoCA range: 13-30) with intact reading skills but underdeveloped literacy habits. Participants were randomly assigned to a reading engagement group or a puzzle-solving control, with both conditions delivered via a home-based iPad intervention with a target dose of 90 minutes per day for 5 days a week for 8 weeks. As an indicator of adherence, the total time allocated to the assigned activity was 47.7 hours (SD=32.9) for the puzzle group and 51.2 hours (SD=29.9) for the reading group. A battery of cognitive assessments was administered before and after the intervention. Based on an intent-to-treat analysis, preliminary data indicate that the reading group selectively benefited in verbal working memory (measured by Category and Reading Span), but enhancement was not observed in nonverbal working memory (Operation Span), reading fluency (WJ-Reading Fluency), verbal fluency (category or FAS), or episodic memory (Hopkins Verbal Learning). The advantage of literacy engagement appeared to be restricted to those without cognitive impairment at baseline (i.e., baseline MoCA≥26). Findings from this pilot study suggest the promise of sustained literacy engagement for maintaining certain aspects of cognition. Individual differences suggest the need for tailoring according to baseline cognitive status. (Supported by NIA R21 AG052237)

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16: Perceived Stigma and Quality of Life in Persons with Parkinson’s Disease and Comorbid Chronic Illnesses

**Poster Session:** F

**Presenter:** Samia S Islam, Boston University

**Keywords:** Parkinson's Disease, Quality of Life, Illness and Chronic Disease

**Abstract:** Objective: Higher perceived stigma and reduced quality of life (QoL) are common in persons with Parkinson’s disease (PwPD). Comorbid chronic illnesses may exacerbate these problems. Using an online survey, we investigated the potential impact of comorbidities on both stigma and QoL in PwPD.
Methods: 361 PwPD (186 women, 175 men) received the Parkinson’s Disease Questionnaire (PDQ-39) as a QoL measure; the Stigma Scale for Chronic Illness (SSCI), Mental Health Consumers Experience of Stigma, and PDQ-39 stigma subscale as stigma measures; and questions about motor symptoms, daily functioning, and various comorbid illnesses. Mann-Whitney U-tests and t-tests assessed the relations between presence/absence of individual comorbidities and both extent of stigma and QoL. We also correlated the number of comorbidities with stigma and QoL scores.

Results: The number of comorbidities was positively correlated with PDQ-39 scores ($\rho=0.12$, $p=0.025$). PwPD with comorbid kidney disease, lung disease, or diabetes scored significantly higher on all stigma scales ($p's<0.01$). Those with diabetes or thyroid disease reported lower QoL ($p's<0.01$). PwPD with a history of head injury had higher SSCI scores and reported a larger number of and more severe motor symptoms and more impaired daily functioning ($p's<0.025$).

Conclusions: In PwPD, the presence of certain comorbidities was associated with more perceived stigma and poorer QoL, and the number of comorbid illnesses was correlated with poorer QoL. These findings provide a foundation for understanding how comorbid chronic illnesses may put PwPD at risk for stigma and reduced quality of life.

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17: Executive control training in older adults with chronic heart failure: Results from a randomized controlled trial
Poster Session: F
Presenter: Julia Karbach, University of Koblenz-Landau
Keywords: Cognitive Control, Executive Function, Individual Differences, Interventions, Training
Abstract: With increasing age, executive control (working memory, inhibition, cognitive flexibility) is subject to significant changes. Recent work indicated that intensive cognitive training yielded long-lasting performance improvements that transferred to untrained tasks and abilities. While evidence for these transfer effects is mixed, there is consensus that individual differences in performance gains are massive. Given that recent evidence showed larger gains after executive control training in low-performing individuals (compensation effect), the current study examined a group of older adults that exhibited cognitive impairments going beyond those reported in healthy aging: patients suffering from chronic heart failure. These patients are known to be impaired in terms of memory, perceptual speed and executive control, which increases hospitalization rates and mortality. In a randomized controlled trial, we examined 105 patients (mean age=67.10 years, SD=9.40) that were assigned to a training group (n= 35), an active control group (n=33) or a passive control group (n=37). The training group performed six training sessions including tasks tapping working memory, inhibition and flexibility. The active control group performed six sessions of general knowledge training. Pretest and posttest included measures of short-term memory, episodic memory, working memory, inhibition, cognitive flexibility, fluid intelligence, processing speed as well as self-rated depression, anxiety, self-care and daily cognitive performance. Results showed that the training group significantly improved on all training tasks. Pretest-posttest comparisons revealed that the training group improved more than the control groups in terms of short-term memory, working memory
and self-reported cognitive performance. Improvements were larger for individuals with lower baseline performance.

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18: Impact of Exercise on Non-Motor Symptoms of Parkinson’s Disease  
**Poster Session:** F  
**Presenter:** Shraddha B Kinger, Boston University  
**Keywords:** Parkinson’s Disease, Exercise and Fitness, Depression, Anxiety  
**Abstract:** Objective: In addition to motor symptoms, persons with Parkinson’s disease (PwPD) commonly experience non-motor symptoms (NMS). Physical exercise is known to attenuate motor symptoms in PwPD, but its role in managing NMS is less well understood. We investigated the relation between self-reported exercise and NMS in PwPD, hypothesizing that more exercise would be associated with fewer and less severe NMS.

Methods: Participants with PD (273; 152 women, 121 men) took an online survey, responding to the NMS Questionnaire (NMSQ), the Beck Depression-II and Anxiety Inventories, and questions about exercise habits. Independent sample t-tests compared NMS scores between exercisers and non-exercisers. We also examined whether there was a dosage effect for the exercisers, indexed by self-report of continuous minutes of exercise per day and number of days of exercise per week.

Results: PwPD who exercised had fewer and less frequent symptoms on the NMSQ and lower depression and anxiety scores (all ps<.001). More exercise per day correlated with lower levels of anxiety (p=-.16, p<.05), but not with other NMS. Number of days of exercise per week was not associated with any NMS.

Conclusions: NMS were fewer and less frequent, and depression and anxiety less severe, in PwPD who exercised relative to non-exercisers. Those who exercised longer per day reported less anxiety. Exercise may relieve NMS, and/or those with fewer or less frequent NMS may be more likely to exercise. Further studies are needed to establish causality between exercise and NMS in PwPD.

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19: Generation for Generation: Older adults’ experiences of participating in a school-based intergenerational engagement intervention in Scotland.  
**Poster Session:** F  
**Presenter:** Anna Krzeczkowska, University of Strathclyde

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Keywords: Older Adults, Intergenerational Engagement, Volunteerism, Focus Group, Qualitative Research Methods

Abstract: Generation for Generation is a moderate-intensity, intergenerational engagement intervention designed to promote cognitive, health and social function in older adults. Volunteers assisted primary school teachers in the classroom by helping pupils aged 4-8 with reading, writing and numeracy tasks. They were asked to commit eight hours per week for six months during 2018-2019. Although benefits of intergenerational engagement for both older adults and children have been demonstrated and promoted, evidence regarding positive or negative impacts on older people is still limited. This study explored benefits and challenges associated with intergenerational engagement volunteering from the volunteers’ perspective. After completing their 6-month programme, seven older adult volunteers (63-80 years old; 86% female) participated in a 2-hour focus group. Data from this focus group, as well as volunteers’ weekly reflective journals completed during the programme, were analysed using thematic analysis. A number of intra- and inter-personal benefits and challenges of intergenerational engagement were reported by the volunteers, including physical demands, financial issues, decision making under uncertainty, regaining a sense of purpose, a sense of achievement, and building new social connections. Notably, five out of the seven focus group participants were still engaging with the programme beyond their 6-month placement, which emphasises the importance of and a need for the new role in their lives. Understanding older adults’ perceptions of intergenerational engagement is important to improve programme design, increase retention in future interventions, and maximise the rewarding aspects of intergenerational engagement.

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20: Project GUSTO: A cooking intervention to improve cognitive-motor dual-tasking and executive functions
Poster Session: F
Presenter: Karen ZH Li, Concordia University, PERFORM Centre
Keywords: Training, Executive Function, Multi-Tasking, Working Memory, Interventions
Abstract: Planning meals, shopping, and cooking are complex tasks requiring considerable executive function and motor coordination. These core processes are age-sensitive, and their decline may deter individuals from these activities. The GUSTO protocol was designed to improve social engagement and cooking skills in people with acquired brain injury. However, the effects of GUSTO in healthy older adults are not known, nor have cognitive-motor and executive functions been examined as outcomes. Community-dwelling older adults (65-85 years) were recruited, who reported infrequent cooking, and a desire to improve their cooking ability. Assessment of single-and dual-task mobility (Timed-Up-and-Go, n-back) cooking skills, and executive function (computerized Breakfast Task) were given before and after training, and at 3-month follow-up (T1, T2, T3). A subset of participants also contributed baseline data (T0) to assess learning effects. The GUSTO protocol (planning, shopping and cooking meals), was delivered to groups of 5 participants over 7 weeks (2, 4h session/wk) in community kitchens, by a bilingual occupational therapist. Preliminary results include 22 participants (M=71 years; range: 61-81). The primary outcome, cooking proficiency, was significantly improved (p<0.001) post intervention, with no significant change between post-intervention and follow-up, indicating skill maintenance (p=0.55). In the Breakfast Task, processing speed was significantly improved post-intervention (p=0.02) and between post-intervention and follow-up assessments (p=0.09), similar to task completion time (p=0.03). In cognitive-
motor dual-tasking, n-back working memory improved significantly from T1 to T3, under single- and dual-task conditions (p≤.012). These results suggest that GUSTO benefitted healthy older adults in terms of practical cooking skill as well as executive control and working memory.

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21: Structural Equation Modeling of two Version of Senior WISE Memory Training
Poster Session: F
Presenter: Graham J McDougall Jr, Florida State University, College of Nursing
Keywords: Memory, Memory Complaint, Interventions, Depression, Yoga
Abstract: Purpose: Using structural equation modeling (SEM) we empirically tested the Senior WISE model with full information maximum likelihood estimation predicting episodic from memory complaints, memory performance, trait anxiety, state anxiety, and depression after exposure to the Senior WISE intervention. Methods: Two studies conducted from 2006-2011 were combined. The intervention group received the Senior WISE intervention (N=130). The other sample received the Senior WISE intervention with an added YOGA element to the beginning of each session (N=103). Methods. SEM was implemented to allow for the correlations among all research variables and constrain the variances of each variable to be the same at both time points. The hypothesized model included paths from pre-intervention to post-intervention values for each research variable of age, gender, years of education, and ethnicity to each of the six pre-intervention research variables along with all covariance's among pre-intervention research variables and all covariance's among post-intervention research variables. Results: Significant predictors of cognitive function post-intervention include pre-intervention trait anxiety and pre-intervention cognitive function. Significant correlations were present between post-intervention cognitive function and post-intervention memory complaints and trait anxiety. The hypothesized model was not supported by the data (RMSEA=0.141, CFI=0.624). Compared to the group who received Senior WISE, the group that received Senior WISE + YOGA resulted in higher scores post-intervention in memory complaints, memory performance, and state anxiety. Neither the control group nor the Senior WISE + YOGA group experienced significant changes in trait anxiety, depression, or cognitive function when compared to the control group.
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22: Repetitive Head Impacts and Suicidality Among the Homeless
Poster Session: F
Presenter: Philip H Montenigro, Department of Anatomy and Neurobiology, Boston University, Department of Neuropsychology, UNH Manchester
Keywords: Concussion, Suicide, Homeless, Head Injury
Abstract: An association between repetitive head injuries from sports and later-life neurobehavioral impairments has been reported. To date, no research has investigated these associations in homeless individuals and the potential relationship between multiple head injuries and suicidality. The purpose of this study was to examine the relationship between repetitive head injuries and clinically significant suicidality among homeless individuals. A sample of 120 male and female homeless patients were interviewed in Boston, MA. The interview included a well-validated assessment of suicidality (Suicide Behaviors Questionnaire-Revised SBQR), and retrospective self-report measures of head injury (Brain
Injury Screening Questionnaire) and homelessness. Data analysis was performed using Pearson, \( \chi^2 \) tests, and t-tests to compare 82 participants (mean age=52.29, SD=9.61) with repetitive head injuries (two or more) versus 38 participants (mean age = 52.36, SD=13.58) with no history of repetitive injuries (one or none). The number of head injuries correlated significantly with a higher SBQR score (\( r=1.97, p=.032 \)). Also, longer duration of homelessness correlated significantly with SBQR score (\( r=.217, p=.018 \)). Furthermore, the proportion of participants with clinically significant SBQR scores (defined as attempted suicide) is significantly higher in the group with two or more concussions (chi square=4.64, p=.018), and longer duration of homelessness significantly correlated with SBQR score (\( r=.217, p=.018 \)). While preliminary, these findings suggest that homeless persons with history of multiple head injuries have greater risk of suicidality. Furthermore, the risk of suicidality increases with greater duration of time being homeless. Future research would benefit from a larger sample size and longitudinal study design.

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23: Examining Risk of Incident Dementia and Cognitive Trajectories in Lifestyle Engagement Subgroups of Community-Dwelling Older Adults: A Latent Class Approach

**Poster Session: F**

**Presenter:** Kyle D Moored, Johns Hopkins Bloomberg School of Public Health

**Keywords:** Activity Engagement, Measurement, Longitudinal, Lifestyle Correlates, Cognitive Decline

**Abstract:** Engagement in lifestyle activities can be neuroprotective, but it remains unclear what aspects of engagement are most beneficial. For self-reported activity inventories, examining response patterns may better characterize both quantitative (e.g., number) and qualitative (e.g., characteristic/motivational) differences in engagement. We used a subset of 18 physical, intellectual, or social activities from the Lifestyle Activity Questionnaire. We performed latent class analysis to characterize subgroups with distinct activity response patterns and examined whether they have differential risk of incident dementia and different cognitive trajectories over time. A three-class model was chosen based on fit statistics and interpretability. Class 1 (Highly intellectually/socially active) participated in more social leisure activities (e.g., movies) than Classes 2 (Socially/less intellectually active) and 3 (Less intellectually/socially active). Class 2 participated in more institutional social activities (e.g., church) than Class 3. In Cox proportional hazard models adjusted for potential demographic and health confounders, Class 1 had a reduced risk of dementia compared to Classes 2 and 3. These results suggest that subgroups characterized by less engagement in leisure social and intellectual activities have increased risk for dementia. Extending upon these findings, we examine whether Classes 2 and 3 also have accelerated declines in domain-specific cognitive measures, which may better specify how class membership influences cognitive aging for both those who do and do not advance to dementia. Finally, our findings also highlight subgroup differences in activity types (e.g., participation in social institutions in Class 2) that may be leveraged by further behavioral interventions to reduce cognitive impairments with age.

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24: Learning to preserve: foreign language training as a cognitive ‘vaccine’ to prevent old-age disorders?
Poster Session: F
Presenter: Saskia E Nijmeijer, University Medical Center Groningen, University of Groningen
Keywords: Bilingualism, Cognitive Control, Memory Complaint, Depression, Interventions
Abstract: With the number of older adults reaching record levels, so too does the number of elderly experiencing old-age disorders such as mood- and cognitive disorders. Older adults typically show weakened cognitive flexibility, which has been related to cognitive decline or depression. Learning a new foreign language might help combat these disorders by increasing cognitive flexibility and could well be among the cognitively stimulating activities – such as playing music and physical activity - that promote healthy aging. Previously, foreign language training has been shown to improve self-esteem and well-being (Pot, Porkert, & Keijzer, 2019).

The objective of this study is to determine whether learning a new language affects cognitive flexibility, its neural underpinnings, and improves symptoms of common old-age disorders. We specifically target seniors at risk for Mild Cognitive Impairment (MCI) and depression. The effects of an intensive three-month foreign language training (n=66) are compared to music training (n=66) and a social intervention (n=66) to control for non-specific cognitive training and social activation effects.

We present preliminary results of the first cohort of participants (n=63) regarding the effects on cognition and emotional health. Data shows that over time, participants all improved in global cognition (p < 0.0) but no significant effect of group was found (p = 0.2). The results of this study can shed light on the ultimate question whether foreign language training in seniors can slow down cognitive aging and reduce vulnerability for old age depression and what its role is vis-à-vis other cognitive intervention program, such as musical training.

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25: Younger and Older Adults’ Prospective Memory: The Role of Delay Task Difficulty and Thinking About One’s Future Intention
Poster Session: F
Presenter: Alison M O’Connor, Brock University
Keywords: Prospective Memory, Mind Wandering
Abstract: Previous research suggests that delay task difficulty can impact subsequent prospective memory (PM) performance (i.e., one’s memory to carry out future intentions); however, results have been inconsistent and little research has examined this among older adults. The present study examined younger (N = 60) and older (N = 57) adults’ PM performance after completing an easy or difficult task (easy vs. difficult series of Raven’s matrices). To assess if delay difficulty impacted the extent to which participants thought about their PM intention, participants were asked to report on what they thought about during the delay interval at two-time points (during the delay task itself and retrospectively after all tasks were complete). Younger adults outperformed older adults on the PM task (p = .018); however, delay task difficulty did not impact PM for either age group (p = .162). Compared to younger adults, older adults were more likely to report thinking about their PM intention when probed during the delay interval (p = .023); however, doing so did not predict PM performance (p = .652). From the retrospective reports, younger adults reported thinking about the PM intention during the delay at higher rates than older adults (p = .036), and more frequent PM thoughts predicted superior PM performance (p < .001). These results contribute to the limited research on how delay tasks affect subsequent PM performance among younger adults.
and older adults and help to provide new insight into various methods for capturing what participants think about during the delay interval.

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**26: Younger and Older Adult Perceptions of Health-Related Risk**
**Poster Session:** F
**Presenter:** Emily L Onken, University of Wisconsin - Eau Claire
**Keywords:** Sensation and Perception, Health and Well Being

**Abstract:** Older adults face a much larger risk for developing certain ailments (e.g. heart disease) than do younger adults (Jaul & Barron, 2017). Accurate perception of this increased risk is crucial since older adults’ risk perceptions are directly related to the likelihood of being physically active (Stephan et al., 2011). Inaccuracies can either be over- or underestimations of actual risk, with some older adults underestimating their risk because they already practice preventative measures (Ruthig, 2016). Older adults’ self-perceptions of their health can also reflect underestimation in comparison to assessments made by a family member (Rolison et al., 2019). Regardless of the underlying cause, inaccurate perceptions of risk can lead to a lack of engagement in preventative measures and thus increase risk of disease. This study compares the risk perceptions of older and younger adults across a variety of ailments, with participants evaluating both their personal risk and the risk for someone else their age. We predict that estimations of risk will be lower for personal risk than the risk for someone else their age in both older and younger adults. Additionally, younger adults will have lower risk perceptions overall due to older adults’ tendency to perceive more risk in a health domain (Bonem et al., 2015). We aim to illuminate inaccuracies in risk perception to enable educators and health professionals to provide greater knowledge to the public on how to practice preventative measures and maintain health well into older adulthood.

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**27: Walking and rhythm: factors that improve versus interfere with gait in aging**
**Poster Session:** F
**Presenter:** Averil Parker, Concordia University
**Keywords:** Multi-Tasking, Cognitive Capacity, Executive Function, Exercise and Fitness, Music

**Abstract:** Cognitive and motor tasks draw on common prefrontal regions in the brain. Competition for common resources results in costs to performance while simultaneously performing cognitive (e.g., talking) and motor (e.g., walking) tasks. Multi-tasking is age-sensitive, with costs to performance being larger for older adults compared to young adults. Recent research shows that walking to an auditory beat (rhythmic auditory cueing) can facilitate walking in patients with Parkinson’s disease. Less well known are how complexity and rhythmic properties of a secondary task interact to impact walking performance in the context of normative aging. The current study investigates these issues using the dual-task design. Young and older adults were asked to perform a listening task and a walking task separately, then simultaneously. The listening task had 3 levels of complexity. In the Simple condition participants synchronized their steps to a series of low tones, in the Moderate condition, to a series of low tones and high tones, and, in the Complex condition, to a series of low and high tones, while also responding via a manual clicker each time they heard a particular pattern of tones. While data collection is ongoing, preliminary results suggest that older adults do not benefit from rhythmic auditory stimulation to improve their walking. The walking performance of younger adults, however, becomes more stable with increasing
complexity of the secondary task. These findings are in line with previous research showing that simple cognitive loads may facilitate gait while complex cognitive loads interfere with gait.

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28: Discordance in Ratings of Quality of Life in Persons with Parkinson’s Disease and Their Informants Through Online Survey
Poster Session: F
Presenter: Celina F Pluim, Boston University
Keywords: Parkinson’s Disease, Quality of Life
Abstract: Objective: Motor or cognitive impairment in persons with Parkinson’s disease (PwPD) often requires care partners to serve as informants in the assessment of PD-related symptoms, including changed quality of life (QoL). Findings are inconsistent regarding concordance between PwPD- and informant-reported QoL, possibly because of inhibition of frank responses in the presence of partners. Using an online survey, we examined the extent of concordance between self- and informant-reported QoL.

Methods: Sixty PwPD-informant pairs completed self- and proxy-versions of the Parkinson’s Disease Questionnaire–39 (PDQ-39) to assess PwPD QoL. In PwPD, we assessed mood (Beck Depression Inventory-II, Beck Anxiety Inventory, and Parkinson Anxiety Scale), and subjective motor symptoms (Unified Parkinson’s Disease Rating Scale Part II). Paired samples t-tests examined differences between groups on scores for total PDQ-39 and 8 subscales. Difference scores were correlated with demographic data and with PwPD mood and motor symptoms.

Results: PwPD reported more PDQ-39 Stigma and Bodily Discomfort than informants (p’s<.05). For PwPD, younger age, more depression and anxiety, and more severe motor symptoms were associated with greater discordance on ratings of Stigma (r’s>.28; p’s<.05). No group differences were found on ratings of total QoL or the other PDQ-39 subscales.

Conclusions: Whereas most aspects of PwPD QoL were concordant, informants underestimated Stigma and Bodily Discomfort, especially for PwPD who were younger and had more mood and motor symptoms, suggesting that certain PD symptoms experienced internally may not be reliably detected by informants. The anonymity provided by online assessment may have enhanced endorsement of internalized symptoms by PwPD.

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29: The Utility of Bingocize for Engaging High-Risk Older Adults in a Health Promotion Program: Evidence from Waves 1 and 2 of the Bingocize Clinical Trial

**Poster Session:** F  
**Presenter:** Heather E Putman, Western Kentucky University  
**Keywords:** Exercise and Fitness, Interventions, Executive Function, Health and Well Being, Activity Engagement  

**Abstract:** There is an increasing need for efficacious programs that encourage older adults to exercise, which can improve cognitive and physical performance. Unfortunately, adherence among older adults is poor, especially for high risk individuals (e.g., low SES, low education). Our clinical trial investigates the efficacy of Bingocize: a socially engaging, technology-based app that integrates bingo games with exercise and health education. Our aim was to investigate whether those in exercise and health education conditions show improvements in aspects of cognition and mental well-being. Participants were randomly assigned to one of four conditions (exercise, exercise & health-education, health-education, or a bingo-only control). All participants completed pre- and post-intervention assessments including neurocognitive tests, health knowledge, and other demographics. During the intervention, participants played Bingocize in groups, biweekly, for 12 weeks. Adherence to the program was high (>90%), suggesting the program can be leveraged to increase desirable behaviors. Participants increased their health knowledge from pre to post-intervention, $F(1,83)=26.73, p<.001$, with a marginally greater increase in those that received health education during the game, $F(1,83)=3.58, p=.06$. The Continuous Performance Test (an inhibition test) was analyzed using signal detection. Post-intervention, better sensitivity (dL) scores on strongly predicted fewer days within the last month of (a) feeling “sad, blue, or depressed”, $r=-0.56, p<0.01$, and (b) not “getting enough rest/sleep”, $r=-0.46, p=0.01$. Response bias (cL) marginally improved in all participants from pre- to post-intervention, $F(1,71)=3.47, p=.07$, but did not interact with condition. Our findings suggest Bingocize is a high-adherence program that shows promise for improving connections between physical and cognitive well-being.

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30: Dementia-friendly intervention for hospitalized elderly with cognitive decline: preliminary results of the Italian Dementia-Friendly Hospital Trial

**Poster Session:** F  
**Presenter:** Alessia Rosi, Brain and Behavioral Sciences Department, University of Pavia, Pavia, Italy  
**Keywords:** Alzheimer's Disease, Dementia, Interventions  

**Abstract:** Acute hospitalization of older patients with cognitive impairments is often followed by a range of adverse outcomes, including physical, functional, cognitive, and well-being decline. These negative outcomes may also result in an increased risk of institutionalization in nursing homes and increased mortality. It is, therefore, essential to investigate how to reduce the adverse outcomes of hospitalized elderly with cognitive decline.

The present study tested the efficacy of a dementia-friendly intervention to promote functional and well-being recovery in hospitalized older adults with cognitive impairments. The dementia-friendly intervention implemented consisted of a five-hour training course for the hospital staff, focusing on...
Sixty-four hospitalized older patients aged 65 years or older were included in this study. Of these participants, 34 (M=82.38; DS=6.79) were recruited before the staff training, representing the control group, and 34 (M=81.97; DS=6.52) were recruited after the staff training, representing the intervention group. Participants were evaluated within 48 h of admission and at discharge with the following measures: Mini Mental State Examination (MMSE), ADL performance measured using Barthel Index, Instrumental Activity of Daily Life (IADL), Hospital Anxiety and Depression Scale (HADS).

The intervention group demonstrated a significantly shorter hospital length of stay, better ADL and IADL performance, and a decrease of anxiety levels at discharge compared to the control group. These results show that a dementia-friendly intervention, focused on improving dementia care practices in health staff is feasible and has the potential to improve outcomes for hospitalized older adults with cognitive impairment.

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31: Dynamics and dimensions of subjective age in response to challenge
Poster Session: F
Presenter: Tanaijah D Rutledge, University of North Carolina at Greensboro
Keywords: Subjective Age, Stereotype Threat, Activity Engagement
Abstract: Subjective age, or the age one feels, predicts health and life satisfaction. Older adults tend to feel around 20% younger than their chronological age, whereas younger adults tend to feel older. Most studies measure subjective age with an overall report of the age an individual feels. Other work considers subjective age to be multidimensional; Montepare (1996) described subjective cognitive age, physical age, and social age. Subjective age is also dynamic, changing in response to one’s experiences. Previous research has shown that older adults’ overall subjective age changes when they are confronted with challenges such as taking a test of memory (Hughes et al., 2013) or grip strength (Stephan et al., 2013). In the current study, we compared the impact of cognitive and physical challenge on overall subjective age as well as targeted dimensions. Participants completed either a balance test (physical challenge), a memory test (cognitive challenge), or a vocabulary test (control). We compared how these tests impact both overall subjective age as well as subjective age within each targeted domain. This research informs our understanding of how subjective age responds to experiences. The link between subjective age and well-being suggests that older adults might avoid healthy activities when they feel older, or vice versa. Accordingly, we also examined how physical and cognitive challenges impact how often a participant anticipates engaging in various everyday activities, both overall and within relevant dimensions.
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32: Exploring Individuals’ Willingness to Engage in Cognitive Training as a Means to Prolong Late-Life Independence

**Poster Session:** F  
**Presenter:** Edie C Sanders, Florida State University  
**Keywords:** Training, Predictors, Activity Engagement  
**Abstract:** Many interventions have been proposed to boost cognition, including “brain game,” meditation, and aerobic exercise training. While it is not yet clear which approach is most effective, an important question is whether, and for how long, individuals are willing to engage in training to reap potential benefits. We explored how much time individuals would hypothetically engage in training to gain prolonged functional independence later in life as a result of cognitive improvements. Young, middle-aged, and older adults (N = 169; M = 41 years, SD = 12 years) completed surveys assessing their willingness to engage in daily training, as well as their health, perceived cognitive ability, beliefs in training efficacy, and personality. Of primary interest was whether willingness to engage in training would differ as a function of training type, and predictors of willingness to engage in training. Participants reported being least willing to engage in daily meditation compared to brain and aerobic exercise training, and participants rated meditation training as the least likely to improve cognition. For all training types, participants reported being willing to engage in significant amounts of training to gain even a small extension of functional independence (12 minutes daily to gain just one week of independence). Perceived enjoyment of training was the strongest predictor of willingness to engage in training. Age was not found to be a significant predictor. Results provide insights into why, and for how long, individuals may be willing to engage in training to improve cognition and prolong independence.

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33: Leisure activity and cognitive performance in the context of healthy aging: cross-sectional and longitudinal evidence across the adult lifespan

**Poster Session:** F  
**Presenter:** Sharon Sanz Simon, Columbia University  
**Keywords:** Activity Engagement, Cognitive Reserve, Cognitive Capacity, Cognitive Decline, Longitudinal  
**Abstract:** Higher rates of leisure activity (LA) have been associated with better cognitive performance and reduced risk of Alzheimer disease. Nevertheless, the specific types of LAs that are more beneficial to cognitive functioning it is still unclear. The aim of this study was two-fold: (1) examine cross-sectional associations between self-reported frequency of LA and cognitive performance in 460 adults (19-80 years), and (2) examine longitudinal associations between baseline LA and cognitive trajectories over 5-years in a subsample of 182 participants. Participants completed neuropsychological measures assessing reasoning, vocabulary, memory and speed of processing; and a LA questionnaire. We considered LA variables reflecting sum of all items, and also four LA categories: cognitive, physical, social, and artistic. Associations between LA and cognition (baseline and % of change) were investigated through regression models adjusted by age, sex, education, and SES. In the case of longitudinal analysis, we also adjusted for baseline performance. In addition, we investigated whether age and sex moderated these associations. Cross-sectional analysis showed that total-LA was positively associated with vocabulary, reasoning and speed, but not memory. In addition, cognitive and physical leisure were independently associated with vocabulary, while art leisure with reasoning. Age moderated the association between LA-physical and reasoning, and between LA-cognitive and speed, indicating these associations were stronger in younger
individuals. In the longitudinal analysis, the baseline cognitive-leisure was positive associated with % of change in speed (i.e., less slowing). We demonstrated that specific types of LA are associated with better cognitive performance and may be relevant for cognitive trajectories. More evidence is needed to confirm these preliminary findings.

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34: Predictors of daily life functionality in dementia patients differ by APOE-ɛ4 carrier status –Results from The Sunnybrook Dementia Study

**Poster Session:** F
**Presenter:** Shraddha Sapkota, Sunnybrook Health Sciences Centre

**Keywords:** Dementia, Methods, Activity Engagement, Predictors, Parkinson's Disease

**Abstract:** Introduction: The role of Apolipoprotein E(APOE)-ɛ4 in predicting functional independence in dementia is debated. In a cohort of dementia patients with Alzheimer’s disease (AD) and Dementia with Lewy Bodies (DLB), we examined the relative importance of demographic and clinical risk factors in predicting Activities of Daily Living (ADLs) by APOE-ɛ4 status.

Method: In the Sunnybrook Dementia Study, we examined various predictors of ADLs by APOE-ɛ4 status in dementia patients (n=214; mean age 70.8±10.0; 52% women; AD=180; DLB=34). Using Random Forest Analysis (RFA), relative predictive importance of the following variables were tested: age, sex, education, APOE-ɛ4, global cognition (assessed by Mini-Mental State Examination-MMSE), white matter hyperintensities, neuropsychiatric symptoms, and dementia diagnosis. Basic and instrumental ADLs (BADL and IADL) were assessed and scores were dichotomized as low and high using a median-split for RFA. In an RFA stratified on APOE-ɛ4 carrier-status, we examined which predictors discriminated the low and high ADL groups.

Results: In order of significance, in APOE-ɛ4- group, worse BADL performance was predicted by (i)higher NPI scores and (ii)DLB, whereas worse IADL performance was predicted by higher NPI score. In APOE-ɛ4+ carriers, worse BADL performance was predicted by (i)higher NPI scores, (ii)male sex, (iii)increasing age, and (iv) lower MMSE score. Worse performance on IADL in carriers was predicted by (i)higher NPI scores, (ii)lower MMSE score, and (iii)male sex.

Conclusion: Predictors of functionality differed by APOE-ɛ4 status. Identifying relative importance of commonly examined demographic and clinical variables on functionality stratified by APOE-ɛ4 genotype may lead to novel pathophysiological insights, and guide personalized interventions in dementia.

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35: Type of Initial Motor Symptom in Parkinson’s Disease Affects Verbal Memory

**Poster Session:** F
**Presenter:** Daniel R Seichepine, University of New Hampshire
Keywords: Parkinson’s Disease, Memory, Executive Function, Cognitive Impairment

Abstract: Parkinson’s disease (PD) is a neurodegenerative disorder, which affects both motor and cognitive functioning and the type of initial motor symptom may differentially impact cognition. Individuals with PD and non-tremor motor symptoms may have worse executive functioning (EF) when compared to the tremor subtype. Neuropsychological evaluations typically evaluate contextual and non-contextual verbal memory as well as visual memory. Non-contextual verbal memory relies heavily on EF; therefore we hypothesized that non-tremor PD would perform worse on this measure when compared to the tremor subtype and healthy controls (HC). Contextual verbal memory and visual memory are less dependent of EF, therefore we hypothesized that groups would not differ on these measures. Forty-six individuals with PD (23 tremor; 23 non-tremor) and 25 age and education matched HCs participated in this study. Overall, the sample was 67.2 (SD=7.2) years old, with 16.6 (SD=2.3) years of education. Participants were administered the Repeatable Battery for the Assessment of Neuropsychological Status, Update. Mixed design and one-way ANOVAs were used to compare groups and follow-up analyses were performed when indicated. On non-contextual verbal memory we observed a significant interaction between group and trial (p=.02) and follow-up analyses indicated that on trials #3 and #4 the non-tremor PD group performed worse than the HC and tremor PD groups (all p-values <.05). The non-tremor PD subtype also performed worse on delayed memory when compared to the HC group (p=.01). No other comparisons were significant. These findings indicate that type of initial symptom in PD differentially affects only non-contextual verbal memory.

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36: Investigating Memory Consolidation Through Transcranial Direct Current Stimulation and Distribution of Training in Older Adults

Poster Session: F
Presenter: Rachel N Smith, University of California, Irvine
Keywords: Working Memory, Training, Verbal Learning, Brain Stimulation

Abstract: The current study aims to improve the memory functions of older adults through the combined use of transcranial direct current stimulation (tDCS) and cognitive training. tDCS is a noninvasive form of electrical brain stimulation that can modulate task-relevant brain activity, and evidence has been accumulating that it may also influence downstream processes related to memory consolidation. Healthy older participants were randomly assigned to receive either active or sham tDCS while studying different word lists. We assessed participants’ immediate and delayed recall, with an engaging 20-minute working memory (WM) training task introduced in-between. Training sessions were spaced apart by either 24 or 48 hours. We hypothesized that tDCS might compensate for age-related deficits in consolidation and boost learning, especially in conjunction with the 48-hour spacing condition. Data collection is ongoing, but preliminary results from 30 participants indicate that the active group recalled more words than the sham group by the end of the training in the delayed recall task, and this effect persisted at a 3-month follow-up. Results from an untrained word list learning task at post-test further support this effect, suggesting that benefits from tDCS go beyond consolidation of words learned during training, but may also boost strategy learning, making it applicable to non-trained material. Unfortunately, there were no differential effects as a function of spacing, and no significant tDCS effects on the WM task. Although preliminary, our results support the potential benefits of tDCS to enhance verbal learning in older adults.
37: Moderators of Exercise Effects on Cognition: Trends Across the Literature
Poster Session: F
Presenter: Matthew J Sodoma, University of Iowa
Keywords: Exercise and Fitness, Cognitive Decline, Executive Function, Associative Memory, Interventions
Abstract: A recent National Academies report summarized effects of physical exercise in randomized controlled trials (RCT) on cognition, and concluded results are not strong enough to recommend exercise as a primary defense against age-related cognitive decline. However, positive RCT outcomes were viewed as beyond random chance, especially considering converging evidence from large prospective and cross-sectional studies, and highly controlled animal experiments supporting causal mechanisms. Therefore, we investigated whether there are key moderating factors driving inconclusive RCT results, such as age, sex, cognitive status, training paradigm and adherence, and how the influence of moderators varies by cognitive domains. Using more inclusive criteria for interventions than the National Academies report, moderators were evaluated across 85 RCT studies based on proportion of negative, null, and positive trial outcomes for the interaction of exercise and control groups. Effects of exercise on cognition were examined for tasks targeting domains representative of hippocampal and prefrontal networks sensitive to aging, such as flexibility, inhibition, associative and episodic memory, and working memory. Significant moderators included session adherence, age, cognitive status, and intervention length. Specifically, interventions that were 3 months or shorter showed more positive interaction outcomes than longer trials, especially when participants were cognitively normal, 50-69 years old, or attended greater than 85% sessions. However, only 2 of 85 studies had the optimal combination of these moderators, suggesting an important direction for future research. Additionally, associative memory was the most sensitive cognitive outcome, but also remains the least studied.
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38: Symptom Dimensions of Depression and White Matter Hyperintensities in Older Adults with Impaired Cognition
Poster Session: F
Presenter: Zinat Taiwo, Georgia State University
Keywords: Depression, Cognitive Impairment
Abstract: Late-life depression (LLD) is associated with increased incidence and progression of dementia, and is considered an important modifiable risk factor. Prior work suggests that cerebrovascular disease is associated with LLD and cognitive impairment in older adults. However, depression remains inadequately treated in older adults, likely due to the heterogeneity in depressive symptoms. This study examined the association between volume of white matter hyperintensities (WMH), a marker of vascular burden, and symptom dimensions of depression, using the National Alzheimer’s Coordinating Center Uniform Data Set. Participants (n = 545, age = 74.61 ± 6.26, 52% female) completed the 15-item Geriatric Depression
Scale (GDS-15) during their baseline visit and had quantified volumes of T2 FLAIR WMH within one year of this visit. Impaired cognitive status (i.e., early MCI, MCI, dementia) was designated based on established diagnostic criteria. Three subscales of the GDS-15 were derived based on prior factor analytic studies: Positive Affect, Dysphoria and Motivation/Withdrawal. Multiple regression was used to examine whether WMH volume was associated with GDS-15 total and subscale scores, controlling for age, sex, race and education. Parallel follow-up models were stratified by clinical diagnosis of major depressive disorder (MDD). Higher Motivation/Withdrawal subscale scores were associated with greater WMH volume, while the total GDS-15, Positive Affect and Dysphoria subscale scores were not significantly related. In stratified analyses, the Motivational/Withdrawal subscale remained associated with WMH in those with MDD only. These findings suggest that motivational depressive symptoms are specifically associated with vascular pathology in older adults with comorbid LLD and cognitive impairment.

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39: Comorbid Diabetes Mellitus Impacts Motor Symptoms, Cognitive Function And Quality Of Life In People With Idiopathic Parkinson's Disease

Poster Session: F
Presenter: Dwaina Thomas, Clark Atlanta University, Emory School of Medicine
Keywords: Cognitive Impairment, Parkinson's Disease, Motor Skills, Quality of Life, Spatial Ability

Abstract:
Introduction: Individuals with diabetes mellitus (DM) have a greater risk of developing Parkinson’s disease (PD). DM has been shown to possibly cause earlier cognitive decline and postural inability in patients with PD. The purpose of this study is to determine the impact of DM on cognitive, motor and psychosocial function in individuals with mild-moderate PD.

Methods: We conducted a cross-sectional analysis of participants with PD (n=198) from five studies conducted over a period of 8 years. We compared performance on cognitive, motor, and psychosocial assessments in people with PD-DM (n=35) versus those with PD without DM (n=163). Pre-test/baseline data were reviewed for normality and statistical analyses to determine differences between groups were performed using appropriate Chi square test and T-tests.

Results: The PD-DM group had fewer years with PD than the PD group (p= 0.034), but had more comorbidities (p<.001), more prescription medications (p=0.018), more males (p=0.016), and greater BMI scores (p=0.001). PD-DM participants had lower Montreal Cognitive Assessment scores (p=0.036), worse Brooks spatial memory performance (p=0.007), worse motor symptoms scores (as per the Unified Parkinson Disease Rating scale, subscale III, p=0.013), were able to rise fewer times during the chair stand without using their hands, (PD N=22; PD-DM N=6 (p=0.041)). Participants with PD-DM also reported lower Short-form 12 mental composite scores (p=0.037), and reduced life space (p=0.048). Trends (p<0.1) were noted in reduced health literacy, mental status/attention testing (serial3’s), reaction time, backward gait speed, communication and freezing of gait. However, there were no differences between groups on performance of PD Health related quality of life, forward gait speed, executive function tests, endurance (6 minute walk test), mobility or motor-cognition.

Conclusions/Discussion: DM may be a risk factor for PD and may impact cognitive, motor and psychosocial function in people with PD. Participants with PD-DM were shown to have more global and spatial cognitive
impairment, greater motor symptoms, less mental quality of life and less life space. Future studies should examine differences in Parkinson’s prognosis between those with and without DM.

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40: Reducing Fall Risks: The Role of Cognitive Impairment in Dual-task Intervention

Poster Session: F
Presenter: Zachary Tuttle, California State University, Long Beach
Keywords: Cognitive Impairment, Cognitive Decline, Attention, Training, Mild Cognitive Impairment
Abstract: Age-related functional decline negatively affects older adults’ ability to perform two tasks simultaneously, increasing fall risks. Dual-task training has been shown to improve older adults’ dual-task performance. However, studies often include either cognitively healthy older adults or those with full cognitive impairment. The effects of dual-task training in older adults with mild cognitive impairment have not been investigated. The current study investigated the effectiveness of dual-task training designed for cognitively healthy older adults as a function of degree of cognitive impairment. Thirty-eight participants, (76.24 ± 8.61 years old), classified as having no impairment (NI; n=16; MoCA>25), mild impairment (MI; n=13; MoCA=22-25), or full impairment (FI; n=9; MoCA<22), participated in an eight week (twice weekly, 75-min each) motor-cognitive dual-task intervention. Participants practiced gait variation, quadrato motor, and balance exercises, and then practiced the same exercises while simultaneously performing cognitive tasks. Gait parameters were collected using the Zenomat walkway. Cognitive performance was measured using percent correct on the Stroop task. These measures were obtained in single-task (ST; tasks performed alone) and dual-task (DT; tasks performed simultaneously) conditions. Dual-task costs were computed as [(DT-ST)/ST]*100. Results of a mixed MANOVA showed that dual-task walking performance improved after intervention for the NI group (p=.013) and the MI group (p=.006), but not for the FI group (p=.383). Results of a mixed ANOVA showed that dual-task cognitive performance after intervention improved equally for all groups (p=.045). These results suggest that older adults with mild cognitive impairment can experience benefits from dual-task training designed for healthy older adults.

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41: Effectiveness of Cognitive Training in Modifying age-related declines in elderlies: A Systematic Review

Poster Session: F
Presenter: Samira Vafa, Sunway University
Keywords: Cognitive Decline, Training, Interventions, Memory, Executive Function
Abstract: Cognitive training has been touted as a possible intervention to minimize the age-related decline in neurotypical older adults. However, most research reported using computer-based tasks that have little
or poor ecological validity, and thus the impact of such training onto untrained tasks is still unclear. Here, we have reviewed prior research using the following criteria: (1) a minimum of 10 training sessions conducted in the last ten years, (2) focuses on cognitive function (3) a neurotypical population. We first had 3198 papers obtained from three databases and came up with 36 papers that met the criteria. Results showed the effect sizes for the overall training gains ranged from small to large (d= 0.1 to d= 3.9). We noted a significant Cohen’s d range for transfer of training gains to untrained cognitive domains by 0.1 to 3.06. Moreover, a level of gains’ persistency ranged from small (d= 0.13) to large (d= 2.80) has been discerned.

Our findings suggest that cognitive intervention is a promising approach for improving cognitive changes associated with aging, however, we detected three gaps that are yet to be investigated. First, the extent to which gains stemming from a classical or computerized training conducting under a well-controlled laboratory condition may transfer to real-life context and daily cognitive tasks; Second, the degree of inducing a homogenous and replicable near and far transfer; Last, the effect of training duration on the durability and transferability of training effects. Hence, further research is required to fill these gaps in the aging literature.

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42: Foreign Language Learning to Promote Cognitive Flexibility in Mild Cognitive Impairment

Poster Session: F
Presenter: Floor A van den Berg, University of Groningen
Keywords: Bilingualism, Cognitive Reserve, Mild Cognitive Impairment, Interventions, Learning
Abstract: The prevention and treatment of preclinical memory disorders are vital in our aging society, considering their association with an increased risk of developing Alzheimer’s disease and other dementias. Strikingly, bilingualism has been linked to a delay in symptom onset of dementia, suggesting that lifelong bilingualism boosts cognitive reserve. This project assesses whether the introduction of a bilingual experience later in life, through foreign language learning, could serve as an innovative preventative anti-aging tool and, potentially, a cognitive therapy. Learning a foreign language involves interference in relation to the new language and the mother tongue, which requires cognitive flexibility (CF) to solve. CF may be especially impaired in Mild Cognitive Impairment (MCI); thus, by engaging in foreign language learning, CF may be enhanced in this population as well as in their neurotypical peers. In this presentation we outline the method underlying this investigation. Through eye-tracking paradigms and neuropsychological testing we aim to capture the effects that ensue from foreign language learning in MCI and neurotypical seniors. To isolate the contribution of foreign language learning to CF vis-à-vis other cognitive interventions, effects are compared to those that emerge in two additional groups of neurotypical seniors participating in musical training and creative workshops. Due to the unique interference process involved in learning a foreign language, it is expected that foreign language learning will boost CF more than other cognitive training programs. If proven successful, foreign language learning could be used to prevent and/or treat late-life memory disorders.

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43: In age we trust: Implicit age bias as a moderator of training outcomes

**Poster Session:** F

**Presenter:** Andrea Vranic, Faculty of Humanities and Social Sciences, University of Zagreb

**Keywords:** Training, Beliefs about Aging, Cognitive Decline, Memory, Strategy Use

**Abstract:** Cognitive trainings for elderly often find benefits of the program, evidenced in near- or even far-transfer on a range of cognitive measures. A few studies have investigated transfer to non-cognitive measures, i.e. dispositional variables or everyday functioning proxies (metamemory, optimism, subjective well-being). These measures are positively correlated to ultimate intervention goals - better everyday functioning. Posttraining gains in these measures often show greater individual differences, and these gains are often not maintained. The lack of maintenance effects might lie in the implicit age bias. Implicit age bias does not appear to be age-related – hence, older participants tend to have negative implicit attitudes towards the elderly. In this study we aimed at investigating the role of implicit age bias in elderly as a potential cognitive bias leading to low maintenance of training-related gains in non-cognitive variables. A sample of 50 community-dwelling older adults participated in the study, divided in treatment (6-session visual mnemonics training) and active control group. Participants were tested (pre-, post-test, follow-up at 3 months) on a range of cognitive and non-cognitive measures, explicit and implicit age attitude. Preliminary results show significant relations of self-assessed everyday functioning and cognitive abilities with implicit attitudes on aging. Implicit age bias seems to be a significant mechanism serving individual differences in training-related gains on non-cognitive, but also cognitive measures.

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44: DLPFC Plasticity-based Video Game Training in Older Adults

**Poster Session:** F

**Presenter:** Ping Wang, CAS Key Laboratory of Behavioral Science, Institute of Psychology

**Keywords:** Training, Interventions, Working Memory, Neuroimaging: Functional

**Abstract:** Among the age-related changes of brain regions, dorsolateral prefrontal cortex (DLPFC) is one of important compensation scaffolding to maintain cognitive performance for older adults. However, both structure and function of DLPFC is decline with aging, limiting the compensation capacity of it. Previous studies showed DLPFC retains plasticity and could be ameliorated. Here we designed a DLPFC plasticity-based video game, aiming to ameliorating the DLPFC structure and function of older adults and improve its compensation capacity. The present study recruited 70 older participants and assigned them randomly into either experimental group or active control group. All participants completed 12 1-hour training sessions in the laboratory over a period of 6 weeks. The training game for experimental group was designed according to N-back paradigm, a typically working memory task related to DLPFC; while the game for active control group was designed only according to 0-back task. Cognitive assessments in different cognitive domains, including working memory, visuospatial ability, attention, memory and processing speed were conducted on participants pre-training, post-training as well as 6 months after training. Structural magnetic resonance imaging (MRI) scans and resting state functional MRI scans were conducted before and after the training. The results suggested that compared to the control group, participants in the experimental group increased their gray matter volume and intrinsic dynamic in DLPFC. These changes improved DLPFC compensation scaffolding capacity and enhancing the cognitive functions, including visuospatial ability, memory, working memory and attention. The present study highlights the
plasticity of DLPFC in the aging brain and demonstrated that combining the neuroscience with the cognitive training could produce extensive effects on older adults.

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**45: Investigating the Benefits of a Combined Cognitive and Motivational Intervention for Older Adults**

**Poster Session:** F

**Presenter:** Alexandria N Weaver, University of California, Irvine

**Keywords:** Working Memory, Motivation, Aging, Metacognition, Interventions

**Abstract:** Most adults over the age of 65 will experience age-related changes in cognitive functions. Previous research has found potential benefits of training cognitive abilities that decline with age, such as working memory (WM). However, despite some promising findings, there is evidence suggesting that standalone cognitive interventions might have limited effects, and that there might be other factors that contribute to improvements in training and transfer. Such factors include motivation, beliefs about the potential to improve one’s intellectual abilities, and memory-self-efficacy. This study considers all these factors by combining WM training and a metacognitive-motivational intervention. Forty healthy older adults aged 65-85 participated in weekly small-group sessions that addressed topics related to healthy cognitive aging and benefits of living an engaged lifestyle while completing a daily tablet-based WM training at home over the course of four weeks (EngAge group). Their performance was compared with the performance of two alternative interventions (WM training; N= 76 or knowledge skills training; N = 76; both without group sessions). Preliminary analyses reveal that overall, there are little differences between the WM training group and EngAge group, but both groups outperform the knowledge skills intervention group. Still, the EngAge group shows stronger effects in inhibitory control and self-reported everyday memory performance as compared with the WM training group at post-test. We are in the process of administering the 3-month and 6-month follow-up assessments, which will reveal whether any intervention-specific improvements persist over time.

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**46: Sensory and cognitive functioning in older adults referred for low vision rehabilitation: Baseline measures**

**Poster Session:** F

**Presenter:** Walter Wittich, University of Montreal, Center for Interdisciplinary Rehabilitation Research of Greater Montreal

**Keywords:** Sensation and Perception, Hearing Loss, Visuo-Spatial Abilities, Vision Loss, Rehabilitation

**Abstract:** Age-related macular degeneration (AMD) is the most common cause of vision impairment among older adults and has been associated with higher risk of dementia. Successful visual rehabilitation,
using magnification devices, has been shown to reduce reading effort. In line with the sensory deprivation hypothesis, this reduced effort may result in improved cognitive function through increased reading activity. The present study aims to investigate the effect of reading rehabilitation on cognitive function of older adults with acquired vision impairment over the course of 1 year. Thirty older adults (age range 69-97 years, Mage = 83.5, SD = 8.55) with visual acuity of 20/60 or less in the better eye, newly referred for reading rehabilitation, completed vision, hearing and cognition tests. Pearson coefficients explored relationships among the variables at baseline. Better cognitive function (Montreal Cognitive Assessment – Blind version), was associated with better speech-in-noise perception (Canadian Digit Triplet Test), r² = -0.23, < 0.05, and faster reading speeds (MNRead), r² = 0.21, p < 0.05; however, these relationships were not significant after controlling for age. The sample remains to small to explore these sensory and cognitive association after considering age and education level. Follow-up with these participants in 6 and 12 months will clarify the potential effect of reading rehabilitation on improving or protecting cognitive abilities in older adults with low vision.

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47: Post-intervention Effects of ICE-ACT Trial (#NCT03141281) on Older Adult Cognition including Performance of Simulated Tasks of Daily Living
Poster Session: F
Presenter: Jong-Sung Yoon, University of South Dakota
Keywords: Interventions, Longitudinal, Training
Abstract: Encouraging improvements in cognitive abilities have been shown for various short-term interventions (e.g., the ACTIVE trial, digital games, aerobic exercise) but there is little evidence for direct impact on independence in older adults. This project compared the effect of broad and directed (narrow) technology-based training on basic perceptual and cognitive abilities in older adults and on the performance of simulated tasks of daily living including driving and fraud avoidance. Participants (N = 230, Mean age = 72) were randomly assigned to four training conditions: broad training using either 1) a commercial web-based “brain game”; 2) a video game; 3) directed training for Instrumental Activities of Daily Living (IADL) training using web-based programs for both driving and fraud avoidance training; or 4) to an active control condition of puzzle solving. Training took approximately 15-20 hours for each intervention condition across four weeks. After the intervention the brain training group reported higher expectation of training effectiveness for perceptual and cognitive abilities whereas the IADL group reported higher expectation of training effectiveness for simulated measures. However, no significant interaction between session and the training conditions has been found across outcome measures at posttest. We found session effects on several measures which could be interpreted as practice effects and some signs of near transfer (e.g., better UFOV performance after the brain training, higher scores in IADL knowledge test after IADL training). We discuss how this project addresses the limitations of previous intervention studies as well as project challenges.
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48: Characterizing and predicting growth components in ACTIVE reasoning session data

**Poster Session:** F

**Presenter:** Brad Taylor, University of Florida

**Keywords:** Training, Music, Interventions

**Abstract:** This study quantified and sought to predict individual differences in level and rate of reasoning training gain in older adults. Predictors were drawn from domains of demographics/health, trainer expectancies, self-belief, and adherence/compliance. Participants included 671 elders from the Reasoning training arm of the multi-site ACTIVE trial (mean age = 73.5 years, mean education = 13.5 years). Ten training sessions occurred between pretest and initial posttest, and the dependent variable was the correct responses on each of the ten end-of-session Reasoning tests. Unconditional mixed effects growth models revealed a piecewise approach fit best: improvement slopes were modeled in two phases: Session 1 to 2, "early improvement"; and Session 2 to 10, "later improvement". Fixed effects for both early and later improvement slopes were significantly (p < .005, Ionnides, 2018) greater than zero, although the latter was shallower. Both evinced significant random variance. Higher education, better initial Mini-Mental Status Examination (MMSE), lower Concern About Aging, higher Self-Efficacy, younger age, and white race were associated with a higher mean level of Reasoning (eta-squared = 0.54), and age and race also predicted greater early improvement (eta-squared = 0.71). Meeting one's trainer's expectations and having higher initial MMSE predicted better later improvements (eta-squared = 0.21). Demographic/self-belief measures predicted both higher level and higher early improvements in Reasoning; trainer expectancies and cognitive status further predicted later improvements. Future work must consider how to adapt training for less advantaged participants and identify additional predictors of later improvements.

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49: Dynamic Useful Field of View Training to enhance older adults’ cognitive and motor function

**Poster Session:** F

**Presenter:** Jerri D Edwards, University of South Florida

**Keywords:** Training, Music, Interventions

**Abstract:** Research indicates that Useful Field of View (UFOV) cognitive training may improve gait speed and balance among older adults (Smith-Ray et al. 2013; 2014). We investigated the acceptability, feasibility, and potential efficacy of a new dynamic form of UFOV cognitive training, Training Under Cognitive Kinematics: TUCK. We hypothesized that TUCK would be acceptable, feasible, and expected TUCK to show improved UFOV and motor performance (i.e., Timed Up and Go, Functional Reach, and Turn 360 tests) effect sizes relative to controls. Analyses were pre-registered (osf.io/ktq6). Older adults (N=107) were screened for eligibility: 69 were enrolled and randomized to one of three arms: TUCK (n=23), computerized cognitive training (n=23), or computer games active control (n=23). Three BrainHQ training exercises were completed in the TUCK and computerized training conditions: Hawkeye, Double Decision,
and Eye for Detail. The randomized sample had an average age of 73, an average education of 15 years and included 59% females: 91% reported Caucasian race and 4% indicated Hispanic ethnicity. Participants agreed that TUCK training was enjoyable, challenging, engaging and satisfying, indicating acceptability. Demonstrating feasibility, 85% of participants randomized to TUCK completed training. To examine efficacy, we calculated the TUCK- and UFOV- training arm effect sizes relative to controls. The effect sizes for TUCK training did not indicate efficacy. However, UFOV training showed effect sizes indicating improved UFOV (d=0.32) and Turn 360 performance (d=0.28). Although computer-based cognitive training may enhance gait speed and balance, a dynamic version of the training incorporating movement did not show potential efficacy.

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