



**INTERNATIONAL SOCIETY FOR  
BEHAVIOURAL NEUROSCIENCE**

**ISBN Annual Meeting 2026**  
Auckland, New Zealand

**Organizers: Donna Rose Addis with Lynette Tippett and Anna Mitchell**

Cordis Hotel, 83 Symonds St, Grafton, Auckland 1010, New Zealand

**Current Executive Members**

- President:** Scott Hayes (2025-2027)
- Vice-President:** Jutta Peterburs (2024-2026) — *End of first term*
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Annakarina Mundorf (2025-2028) – Website/Social Media  
Andrea Protzner (2024-2026) – Membership — *End of first term*

**Recipients of 2026 Travel Awards**

Emma Karlsson  
Soyun Kim

## MEETING SCHEDULE

### SUNDAY, FEBRUARY 22<sup>ND</sup>

6:00pm Welcome Reception – Dr Rudi’s Rooftop Brewing Co.

### MONDAY, FEBRUARY 23<sup>RD</sup>

8:30 – 9:00am *Coffee*

9:00 – 9:25am **Scott Hayes & Donna Rose Addis**, Introductory Remarks

**Symposium I – Advances in understanding autobiographical thought: From the lab to the real world**

**Organizer: Donna Rose Addis**

**(20 + 5 mins)**

9:25 – 9:50am **Donna Rose Addis**  
9:50 – 10:15am **Aleea Devitt - Prospective member**

10:15 – 10:35am *Coffee Break*

10:35 – 11:00am **Jessica Andrews-Hanna**  
11:00 – 11:25am **Sam Audrain**  
11:25 – 11:50am **Peggy St. Jacques**  
11:50 – 12:00pm Discussion

12:00 – 1:10pm *Lunch (on your own)*

**Traditional Talks (15 + 5 mins)**

1:10 – 1:30pm **Jonathan Peelle**  
1:30 – 1:50pm **Sebastian Ocklenburg**  
1:50 – 2:10pm **Emma Karlsson**

2:10 – 2:30pm *Coffee Break*

**Symposium II – Novel approaches for understanding brain and cognitive changes in aging and dementia**

**Organizers: Soyun Kim & Christine N. Smith**

**(20 + 5 mins)**

2:30 – 2:55pm **Soyun Kim**  
2:55 – 3:20pm **Christine N. Smith**  
3:20 – 3:45pm **Nichole Lighthall - Prospective member**  
3:45 – 4:10pm **Jasmeet P. Hayes (guest)**  
4:10 – 4:20pm Discussion

## TUESDAY, FEBRUARY 24<sup>TH</sup>

8:30 – 9:00am      *Coffee*

### **Symposium III – Advances in research on functional and structural connectivity – the cerebellum & beyond**

**Organizer: Jutta Peterburs**

**(20 + 5 mins)**

9:00 – 9:25am      **Kristen Kennedy**  
9:25 – 9:50am      **Jutta Peterburs**  
9:50 – 10:15am     **Mary Pat McAndrews**

10:15 – 10:35am    *Coffee Break*

10:35 – 11:00am    **Andrea Protzner**  
11:00 – 11:25am    **Dale Stevens**  
11:25 – 11:50am    **Reece Roberts - Prospective member**  
11:50 – 12:00pm    Discussion

12:00 – 1:10pm     *Lunch (on your own)*

### **Traditional Talks (15 + 5 mins)**

1:10 – 1:30pm      **Melanie Cohn**  
1:30 – 1:50pm      **Nicole McKay - Prospective member**  
1:50 – 2:10pm      **Steven Greening**

2:10 – 2:30pm      *Coffee Break*

### **Traditional Talks (15 + 5 mins)**

2:30 – 2:50pm      **Sarah Grainger - Prospective member**  
2:50 – 3:10pm      **Julia Kam**  
3:10 – 3:30pm      **Julia Cox - Prospective member**  
3:30 – 3:50pm      **Ludise Malkova**

## WEDNESDAY, FEBRUARY 25<sup>TH</sup>

8:30 – 8:45am *Coffee*

8:45 – 10:15am **Business meeting**

10:15 – 10:30am *Coffee Break*

### **Work in Progress (10 + 10 mins)**

10:30 – 10:50am **Alex Barnett**

10:50 – 11:10am **Natalie C. Ebner**

11:10 – 11:30am **Hicret Atilgan**

11:30 – 11:50am **Andrew Cotton**

11:50 – 1:10pm *Lunch (on your own)*

### **Work in Progress (10 + 10 mins)**

1:10 – 1:30pm **Magdalena Wojtowicz**

1:30 – 1:50pm **Scott Hayes**

1:50 – 2:10pm **Anna Mitchell**

2:10 – 2:30pm *Coffee Break*

### **Presidential Lecture**

**2:30 – 4:00pm Prof. Mike Dragunow**

Faculty of Medical and Health Sciences, Pharmacology, University of Auckland,  
New Zealand

**Title: Human brain neuropharmacology**

4:00pm *Travel to dinner*

**Note: Ferry for Waiheke Island departs from Piers 11 and 12 at the Auckland Ferry Terminal.  
Departure is at 5pm!**

5:00 – 10:15pm *Banquet Dinner - Mudbrick Vineyard*

## THURSDAY, FEBRUARY 26<sup>TH</sup>

08:30am – 4:30pm *Networking session – Tiritiri Matangi*

**Note: Ferry departure time is 9am!**

## FRIDAY, FEBRUARY 27<sup>TH</sup>

*End of meeting. Departure.*

## ABSTRACTS

### SYMPOSIA

MONDAY, FEBRUARY 23<sup>RD</sup> (9:25am – 12:00pm)

**Symposium I – Advances in understanding autobiographical thought: From the lab to the real world**  
**Organizer: Donna Rose Addis – Rotman Research Institute, University of Toronto, Canada**

**Summary:** There has been a recent move in cognitive neuroscience towards the use of more naturalistic tasks to assess cognitive processes such as memory. Although autobiographical cognition is arguably the most natural type of memory tested in the lab, traditional assessment methods are still limited in ecological validity. In this symposium, we present new developments in behavioural and neuroimaging approaches to assessing autobiographical cognition in younger and older adults as well as amnesia. Donna Rose Addis will discuss behavioural and fMRI evidence from tasks that do not constrain the responses generated by participants to theory-driven forms of autobiographical thoughts, uncovering other types of representations that are common and important in everyday life. Alea Devitt will present findings from fMRI and behavioural studies examining the specificity and episodicity of autobiographical memories, showing that objective measurements may not adequately capture the subjective experience of these inherently internal phenomena. Jessica Andrews-Hanna will present results from a multi-method approach to examine autobiographical thoughts across the adult lifespan, revealing similarities and differences between real-world and in-lab assessments. Samantha Audrain will discuss new approaches to probing the neural correlates of autobiographical memory in the scanner, as well as findings from lab-based vs real world assessments of autobiographical memory in amnesia. Peggy St. Jacques will present behavioural and fMRI studies using immersive virtual reality to investigate how depth and first-person experience shape the encoding of real-world events that underlie autobiographical memory. Together, these talks provide a comprehensive overview of advances in the cognitive neuroscience of autobiographical thought.

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#### **Speakers:**

**Donna Rose Addis — Rotman Research Institute, Canada**

**Title: Recasting the past into the future: Examining naturalistic future thinking in aging**

Research on episodic future thinking has primarily used paradigms that elicit the imagining of novel, unplanned and sometimes unrealistic future events. Although these paradigms have been essential to demonstrating the overlapping neurocognitive correlates of memory and future thinking, we hypothesize that in everyday life there is less distinction between remembered and imagined events. Specifically, we propose that people often think about past events re-occurring in the future, a process we have called “recasting”. I will present the results of an online behavioural study that used a more naturalistic, unconstrained future simulation task to investigate the recasting in younger and older adults. We found that irrespective of age, 83% of future events were based on a past event. Recasting was more frequent when thinking about the near future, suggesting the relevance of past events decreasing across future time. We also found that recast future events were easier to imagine and more detailed and plausible than novel future events. I will also discuss preliminary findings from an fMRI study exploring the neural correlates of recasting. Spatiotemporal Partial Least Squares analysis showed that recast future events exhibited overlapping activity with recalled past events in regions such as lateral parietal, cingulate and parahippocampal cortices. In contrast, imagining novel events in either the past or future was associated with increased activity in bilateral hippocampus, anterior temporal and lateral prefrontal cortices. These results advance our understanding of the naturalistic ways people think about their futures in everyday life, showing that the past often becomes the future.

**Aleea Devitt — The University of Waikato, New Zealand (Prospective member)**

**Title: It's all in the details: Objective and subjective measures of autobiographical memory detail in aging**

Different ways of characterising the internal phenomena of autobiographical thoughts do not necessarily align with one another, especially with age. For instance, using experimenter-driven methods, the specific episodic content (e.g., who, what, when, where details) of remembered and imagined events declines with age. In stark contrast, self-report measures of event detail are often inflated with age. I present research investigating the neural and cognitive underpinnings of these age-related changes in memory and imagination of real-world events. We examined modulation of whole-brain networks when retrieving memories that vary in episodic specificity, which parallels the continuum along which autobiographical thought naturally varies in daily life. When recalling episodically specific events, aging was associated with a reduction in the modulation of default mode areas, and upregulation of an area typically involved in semantic retrieval. These neural patterns provide a potential mechanistic explanation for the divergence of experimenter-driven and self-report measures of detail with age: older adults may rely preferentially on semantic over episodic content when making detail judgements. In subsequent research, we tested this idea by examining the trial-by-trial relationship between autobiographical event content and subjective detail ratings. Contrary to predictions, older adults used both episodic and semantic event content to a lesser extent than younger adults when judging the detail of past events. Intriguingly, this pattern reversed for imagined future events. Together these findings demonstrate that experimenter-based methods of assessing autobiographical event detail do not necessarily reflect internal experience, particularly as we age.

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**Jessica Andrews-Hanna — University of Arizona, USA**

**Title: How age and context shape autobiographical thinking: a multi-method approach**

Although recent decades have brought major advances in our understanding of autobiographical memory and thought, much of this progress stems from experimentally prompted studies conducted within laboratory settings. Whether these findings generalize to the kinds of autobiographical thoughts people experience in everyday life remains an open—and critical—question, especially for shaping how we conceptualize changes in normal and pathological aging. In this symposium, I will present three studies involving roughly 4,000 individuals across the adult lifespan that highlight our laboratory's efforts to evaluate whether insights from traditional laboratory-based assessments of autobiographical thought generalize to less constrained tasks and real-world contexts. These studies draw on multiple methods—including ecological momentary assessment, ambulatory audio recordings, and think-aloud paradigms—and incorporate both subjective and objective indices of autobiographical memory and thought. Collectively, the findings both corroborate and challenge conclusions about cognitive aging from the existing literature, including by revealing contexts in which cognitively healthy older adults' autobiographical thoughts may be even more episodically specific than younger adults. I will conclude this talk by emphasizing the practical and scalable value of measuring thought in contexts that better mimic real-world cognition, and preview our current efforts to characterize the neurobiological underpinnings of everyday autobiographical thinking.

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**Sam Audrain — McGill University, Canada**

**Title: The hippocampus and real-world memory: insights from fMRI and amnesia**

The hippocampus plays a central role in encoding and retrieving autobiographical memories, yet its precise contribution remains contested. Standard consolidation models propose that autobiographical memories gradually become independent of the hippocampus, whereas alternative accounts argue that all richly episodic memories are hippocampus-dependent. Functional MRI studies have provided important insights, but the ability to characterize retrieved content and richness of autobiographical memory in the scanner has been limited. In this talk, I will describe work that overcomes this limitation by allowing participants to speak freely in the scanner, enabling precise quantification of autobiographical memory detail as participants construct and elaborate upon retrieved memories.

We revealed a dissociation along the hippocampal long axis: posterior hippocampal activity declined with memory age despite rich autobiographical retrieval, whereas anterior hippocampal engagement remained robust during the construction phase. These findings illustrate the unique contribution of the anterior hippocampus to autobiographical memory construction of even the oldest memories, and highlight that retrieval processes offer novel insights to hippocampal subregion function over time. I will then turn to the question of whether one can acquire new memories without a hippocampus. Drawing on a case of severe amnesia, I will show that although laboratory tests indicate profound deficits, real-world encoding opportunities—rich, multimodal, and personally meaningful—can support long-term memory formation, likely via neocortical mechanisms. Together, these findings highlight the dynamic nature of hippocampal involvement and underscore the importance of studying memory in ecologically valid contexts.

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**Peggy L. St. Jacques — University of Alberta, Canada**

**Title: Bringing the real world into the scanner: How depth influences memory encoding in immersive VR**

Autobiographical memory research faces a persistent challenge: capturing the richness of real-world experience while maintaining experimental control. Building on controlled real-world encoding paradigms, I introduce a new immersive virtual reality (VR) approach that brings everyday events into the MRI scanner through first-person 360° video. This method recreates the spatial richness of lived experience within a fully controlled fMRI environment. We used this paradigm to test how 3D depth, a central characteristic of real-world vision, influences the formation of event memories. Across behavioural and fMRI studies, 3D depth enhanced scene memory above and beyond subjective presence, emotion, and familiarity. During encoding, 3D experiences had stronger neural recruitment of ventral visual cortices than 2D experiences, and this enhanced perceptual processing predicted increased left hippocampal activation linked to subsequent scene memory fidelity. Eye-tracking further showed that 3D depth produced fewer but longer fixations, a focused gaze pattern consistent with strengthened ventral visual input feeding into hippocampal binding. Together, these findings support a mechanistic account in which 3D depth elicits a focused gaze strategy that intensifies ventral visual cortical processing, increasing the fidelity of the perceptual representations that the hippocampus binds into coherent scene memories. These findings illustrate how immersive VR enables controlled investigation of real-world event encoding, offering a powerful new tool for understanding autobiographical memory.

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MONDAY, FEBRUARY 23<sup>RD</sup> (2:30 – 4:20pm)

**Symposium II – Novel approaches for understanding brain and cognitive changes in aging and dementia**  
**Organizers: Soyun Kim – University of California Irvine, USA; Christine N. Smith – Veterans Affairs San Diego Healthcare System, University of California San Diego, USA**

**Summary:** Understanding the behavioral and brain changes associated with normal aging versus changes that lead to dementia are essential for advancing risk assessment and prevention efforts. This symposium brings together researchers leveraging novel methods, including assessment of novel cognitive tests, cognition in technology-mediated contexts, neuroimaging, and genetics, to capture changes linked to normal as well as pathological aging.

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**Speakers:**

**Soyun Kim — University of California Irvine, USA**

**Title: Toward Digital Cognitive Biomarkers: Normative Mnemonic Discrimination Performance Across the Lifespan**

Episodic memory declines in normal aging and is significantly impacted in the earliest stages of Alzheimer's Disease. Mnemonic discrimination, the ability to differentiate similar events into distinct memories, is an integral facet of episodic memory and is known to rely on hippocampal pattern separation. Prior work has demonstrated the utility of this task as a potential digital cognitive biomarker for age-related memory loss and Alzheimer's disease. While several studies have previously demonstrated impaired mnemonic discrimination with older age and in patients with mild cognitive impairment, large-scale, web-based unsupervised testing has not been previously validated across the lifespan. Moreover, norms for mnemonic discrimination tests have not yet been established. In this study, we analyzed data from the Mnemonic Discrimination Task (MDT), implemented in MindCrowd (<https://mindcrowd.org/>), a web-based cognitive assessment platform administered on participants' choice of device (e.g., phone, tablet, computer) without supervision. We used data from N = 2080 (mean age = 60.7, range = 18 – 101 yrs, 82% Female) participants who reported no memory concerns and completed at least one of the three versions (object, spatial, or temporal domain) of the MDT between June 2022 and November 2024. Using the data, we derived regression-based normative models for MDT performance. We found that performance in mnemonic discrimination declines with age across object, spatial and temporal domains. Regression-based norms for the MDTs may provide an important reference for interpreting MDT performance in other samples. Overall, our findings support the feasibility of remote, unsupervised testing of memory function in large samples across the adult lifespan.

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**Christine N. Smith - Veterans Affairs San Diego Healthcare System, University of California San Diego, USA**

**Title: Differential sensitivity of news event memory to medial temporal lobe subregion volumes susceptible to Alzheimer's disease**

Individuals with Mild Cognitive Impairment (MCI) are at risk for developing Alzheimer's disease (AD) and exhibit extensive impairment in remembering the past (retrograde memory) together with only mild impairment in new learning according to traditional tests. Specific medial temporal lobe regions [MTL, transentorhinal cortex (BA 35/36), subiculum (SUB), and CA1] are the first regions in the MTL affected by tau pathology and volume loss in those at risk for AD, whereas the dentate gyrus (DG) is most affected by normal aging. In older adults with either MCI (N=33) or normal cognition (NC) (N=34), we examined if a novel RM news events test (RM-NET) could significantly predict brain volumes of MTL subregions that decline in AD. The MCI group was significantly impaired on the RM-NET compared to the NC group. In the MCI group, the RM-NET significantly predicted SUB and rostral perirhinal (35/36r) volumes, with strong trends for CA1, DG, and entorhinal. The strength of the brain-behavior

correlations for the SUB and 35/36r significantly decreased as memory age increased, suggesting recent time periods were more predictive than remote. No significant relationships between the RM-NET and MTL volumes known to decline in AD were identified in the NC group. Performance on the RM-NET was associated with volumes of regions known to decline early in AD in those at risk for dementia, and the association was stronger than for traditional memory tests. Thus, unlike traditional tests, lower performance on the RM-NET is more likely to reflect risk for AD than it is to reflect normal aging.

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**Nichole R. Lighthall — University of Central Florida, USA (Prospective member)**

**Title: Decision making in aging and ADRD across traditional and technology-mediated contexts**

From everyday choices about food and socializing, to major decisions in domains such as health, career, family, and finances — value-based decision making shapes the direction and quality of our lives across the lifespan. In this context, determining age-related vulnerabilities and pathways to successful aging requires research that can clarify when and why age differences in value-based decision making occur. My talk will feature work from my lab that addresses these questions through research on mechanisms of decision processing in healthy cognitive aging and Alzheimer's disease and related dementias (ADRD) across both traditional and novel, technology-mediated contexts (e.g., AI-generated faces, videochat platforms). I will discuss findings that identify decision-processing subcomponents that drive age differences in decision making, including learning and memory, affective processes, and social factors – and to what degree these alterations can be attributed to age-related changes in brain function. Finally, my talk will discuss how decision behavior may be impacted by the introduction of novel technologies and modes of communication in normal cognitive aging and ADRD.

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**Jasmeet Hayes — The Ohio State University, USA (Guest)**

**Title: Traumatic brain injury as a risk factor for accelerated aging and Alzheimer's Disease**

Traumatic brain injury (TBI) is a common neurological insult and an established risk factor for later-life dementia, including Alzheimer's disease (AD). However, the mechanisms by which TBI accelerates AD-related pathology remain unclear. In this talk, I will present our latest work examining the independent and combined effects of AD genetic risk and TBI on brain, biomarker, and cognitive outcomes. We first show that polygenic risk scores for AD are associated with neural, protein, and cognitive markers of vulnerability before clinical symptom onset, highlighting genetic risk as a powerful tool for identifying preclinical susceptibility. Building on this, we test a double-hit framework in which TBI interacts with elevated AD genetic risk to confer disproportionate risk for adverse outcomes. Our findings demonstrate that the combination of TBI and high AD polygenic risk is associated with altered brain structure, increased AD-related protein burden, and worse cognitive performance. Together, this work identifies early neurobiological pathways linking genetic risk and brain injury to Alzheimer's disease vulnerability long before diagnosis.

TUESDAY, FEBRUARY 24<sup>TH</sup> (9:00am – 12:00pm)

**Symposium III – Advances in research on functional and structural connectivity – the cerebellum & beyond**  
**Organizer: Jutta Peterburs – MSH Medical School Hamburg, Germany**

**Summary:** Understanding the organization of the human brain is essential for uncovering the neural dysfunctions underlying neurological and psychiatric disorders, as well as age-related brain changes in health and disease. This symposium brings together five presentations highlighting recent advances in structural and functional brain connectivity research. Kristen Kennedy will open with findings on age-related changes in cerebello-cerebral structural connectivity, showing that executive function performance in a large sample of healthy adults (aged 20–94 years) is linked to white matter integrity in cerebello-thalamo-cortical tracts. Building on cerebello-cerebral interactions, Jutta Peterburs will present results from resting-state fMRI analyses after cerebellar stroke, revealing increased within-cerebellar directed connectivity, as well as chronicity-dependent changes in connectivity between the cerebellum, salience, fronto-parietal, and default mode networks. Expanding beyond the cerebellum, Mary Pat McAndrews will discuss how functional connectivity during task performance informs our understanding of autobiographical and semantic memory retrieval in left temporal lobe epilepsy. Andrea Protzner will then examine how robust, group-level connectivity features linked to treatment response in major depression translate to the individual level, emphasizing variability in functional networks. Focusing on neurodevelopmental disorders, Dale Stevens will present results demonstrating that atypical connectivity of intrinsic functional networks in autism spectrum disorder (ASD) is associated with individual differences in symptomatology. Finally, Reece Roberts will address the convergence of static and dynamic measures of functional connectivity in large datasets.

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**Speakers:**

**Kristen Kennedy — The University of Texas at Dallas**

**Title: Age-related cerebello-thalamo-cortical white matter degradation and executive function performance across the lifespan**

The cerebellum supports higher-order cognition, such as working memory and executive function (EF) both directly and through connection with prefrontal areas via cortical loops. Thus, age-related degradation to white matter connectivity comprising cerebello-thalamo-cortical (CTC) loops may underlie age-related differences in EF. In 190 healthy adults (aged 20-94 years) we collected diffusion tensor imaging scans and multiple tests of working memory and EF. Deterministic tractography was used to generate CTC tracts from which white matter metrics (mean, radial, axial diffusivities) were extracted. General linear model results indicated that reduced white matter integrity (i.e., higher diffusivity) was associated with significantly poorer EF performance in an age-dependent fashion. Higher mean, radial, and axial diffusivities in fronto-cerebellar white matter was associated with lower EF scores in older, but not younger, adults. These findings suggest fronto-cerebellar white matter connectivity is important for executive function performance and lend mechanistic evidence to the role of the cerebellum in age-related differences in higher-order cognitive operations

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**Jutta Peterburs — MSH Medical School Hamburg, Germany**

**Title: Cerebello-cerebral functional connectivity after cerebellar stroke as revealed by causal discovery analysis (CDA)**

Cerebellar stroke can lead to persistent cognitive, affective, and executive deficits, often described as the Cerebellar Cognitive Affective Syndrome (CCAS). While acute and subacute phases of recovery have been associated with cerebello-cerebral disconnection as well as reorganization in chronic stages, the reorganization of large-scale brain networks after cerebellar injury remains poorly understood. Directed connectivity analysis applying the Best Order Score Search algorithm was used to examine interactions between the cerebellum and three large-

scale networks, salience (SAL), frontoparietal control (FPN), and default mode (DMN), in resting-state fMRI of chronic cerebellar stroke patients (n = 21; mean chronicity >9 years) and healthy controls (n = 29). Group comparisons revealed preserved average cerebello-cortical connectivity but significantly greater within-cerebellar directed connectivity in patients. Additionally, patients exhibited a chronicity-dependent greater SAL-driven outputs to both the FPN and DMN, and a chronicity-dependent decline in cerebellum-to-SAL connectivity. These results indicate that chronic cerebellar stroke recovery involves stage-specific network reorganization, with salience-network coupling shifting towards cortical hub dominance over time post-lesion. Longitudinal, multimodal imaging combined with behavioral measures is needed to determine whether these patterns represent adaptive compensation or maladaptive overreliance on cortical switching hubs, and to guide targeted rehabilitation strategies.

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**Mary Pat McAndrews — Krembil Brain Institute, University Health Network, Canada**

**Title: What connectivity adds to activation in understanding episodic and semantic retrieval in temporal lobe epilepsy**

It takes a brain village to retrieve a memory, but how does the cross-talk amongst the villagers illuminate mechanisms of dysfunction underlying aberrant activation at retrieval? I will discuss two sets of studies in which we examine task-related activation and functional connectivity, an older one assessing autobiographical memory (AM) and a recent one examining retrieval of information about common (e.g., cat) and proper (e.g., Puss in Boots) semantic memory (SM) entities. In both AM & SM, patients with left TLE show behavioral deficits and reduced task-related activations in the affected hippocampus and other components of the relevant networks. In AM there are striking differences in network connectivity between patients and controls, where the typical dynamics of anterior and posterior connectivity between hippocampus and neocortex during successive retrieval stages are derailed by a lack of flexibility in intrinsic hippocampal connectivity. In our SM task, differences between groups were more modest, and principally related to network efficiency. These disparate findings may relate to the degree to which task-relevant damage affects a 'hub' of the retrieval network or possibly the intrinsic resilience of these networks. Both sets of results give rise to hypotheses regarding the import of activation and connectivity in cognitive networks.

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**Andrea Protzner — University of Calgary, Canada**

**Title: Functional Connectivity and Its Individual Variation in Treatment for Major Depression**

Several studies have explored whether functional connectivity metrics can be used to predict treatment outcomes in major depression (MD), as this could enhance clinical decision-making. However, inconsistent findings and methodological issues limit generalizability. Moreover, little is known about how connectivity features apply at the individual level, which is essential for translation to clinical practice. In this talk, I will discuss opportunities and challenges toward personalized care. First, I will address the robustness of fMRI functional connectivity features in three networks implicated in MD—the default mode (DMN), salience (SN), and cognitive control (CCN) networks—using data from a large multi-site sample. Second, I will examine the relative contribution of individual variation versus group differences in functional connectivity across several comparisons including patients versus controls, treatment responders versus non-responders, and females versus males. Results show that individual-specific and shared connectivity patterns across participants and sessions explain most of the variance, while group-level differences account for only a small proportion. Overall, these findings suggest that although robust, group-level connectivity features of treatment success can be identified with large samples and standardized methods, individual variability needs to be considered to achieve clinical applicability. I conclude with ongoing work examining how individual differences in functional connectivity can be leveraged to inform personalized treatment in depression.

**W. Dale Stevens — York University, Canada**

**Title: Atypical connectivity among three intrinsic functional networks in autism relates to individual differences in symptoms**

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by difficulties in social interaction and communication, and by restricted and repetitive behaviours. Flexible goal-directed cognition and action, which underlie domains of cognition/behavior impacted in ASD, require integrating internal goals and knowledge with information from the external environment to achieve desired outcomes. This fundamental ability is subserved by three intrinsic functional brain networks—the antagonistic default and dorsal attention networks, which support internally and externally directed cognition, respectively, and the frontoparietal control network, which flexibly couples with either the default or dorsal attention network to dynamically direct the locus of attention. We used a novel method of analyzing resting-state fMRI data to compare the hierarchical organization of these networks between a group of young individuals with ASD ( $n = 25$ ) and a matched group of typically developing (TD) individuals ( $n = 25$ ). Our findings demonstrate that ASD is associated with attenuated anticorrelation between the default and dorsal attention networks and fractionation of the frontoparietal control network, which predicts ASD symptomatology. These results provide a framework for understanding how differences in intrinsic brain network interactions are related to individual differences in ASD symptoms and suggest potential targets for interventions.

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**Reece Roberts — The University of Auckland, New Zealand (Prospective member)**

**Title: Do static and temporal measures of functional connectivity converge at large sample sizes?**

Using functional MRI data, researchers routinely assess task-related functional connectivity. This method generally takes two forms. In static functional connectivity, a summary measure of brain activity (e.g., percent signal change) is calculated for each region and each participant, and inter-subject correlations are computed. In temporal functional connectivity, correlations are calculated on the time-series signal within participants for each region pair. Although these two approaches share the same statistical procedure (Pearson's correlation) and the same name ("functional connectivity"), there is no necessary correspondence between them. Indeed, we have previously shown that while the two methods often agree, there are cases in which they produce Simpson's paradox effects—that is, reliable effects in opposing directions. However, that study used a very small sample size ( $N = 16$ ), making it unclear to what extent the pattern of results reflected sampling error. In the current study, I present a systematic evaluation of the correspondence between static and temporal task-related connectivity measures in a large dataset (HCP N-back task;  $N = 1032$ ). The results indicate the following: i) at large  $N$ , the two measures produce similar patterns of results within a condition; ii) the measures show no correspondence when comparing connectivity between conditions; iii) temporal connectivity measures yield more statistically reliable effects; and iv) using resampling procedures, temporal connectivity measures are remarkably stable at smaller sample sizes ( $N < 100$ ) relative to static connectivity measures. The relevance of these findings to related questions (e.g., brain-behaviour correlations, functional connectivity in other imaging modalities) will be discussed.

## **TRADITIONAL TALKS**

MONDAY, FEBRUARY 23<sup>RD</sup> (1:10 – 2:10pm)

**Jonathan Peelle — Northeastern University, USA**

**Title: Approaching a neuroscience of real-world speech comprehension using movies**

Although most cognitive neuroscientists are interested in how humans interact with the real world, our data collection often prioritizes tight experimental control over ecological validity. In the context of communication, much of what we know about the neuroscience of speech and language comes from fMRI studies in which auditory-only words and sentences are played in the absence of broader context. I will discuss a set of experiments in which we have been using brain responses during movie watching to improve the sophistication of our speech and language modeling. In experiments using both fMRI and high-density fNIRS we have identified regions of the temporal lobe and beyond that respond more to audiovisual speech than to auditory only speech. We have also found that listeners with cochlear implants, who must contend with a degraded auditory signal, rely more on DLPFC than listeners with normal hearing when processing auditory speech in movies, consistent with an increase in cognitive demands during listening. Finally, we have been able to tease apart semantic relationships between presented words from overall predictability. Together these studies highlight the possibilities of using naturalistic stimuli to study the neuroscience of speech and language.

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**Sebastian Ocklenburg — MSH Medical School Hamburg, Germany**

**Title: The behavioral neuroscience of whistled languages**

Left-hemispheric language dominance is a well-known characteristic of the human language system. For spoken languages, almost all right-handers and 75% of left-handers show a clear left-hemispheric processing dominance. However, it has been shown that leftward language lateralization decreases dramatically when people communicate using whistles. Whistled languages present a transformation of a spoken language into whistles, facilitating communication over great distances. In my talk, I will present the results from an ongoing project on the behavioral neuroscience of whistled languages. In particular, I will focus on the results of a recent mobile EEG study on whistled Spanish. Mobile EEG was recorded during dichotic listening in 117 participants, consisting of proficient Spanish whistlers and two control groups from two different language families. On the behavioural level, the typical right ear advantage was found in all three groups for spoken stimuli but was strongly reduced for whistled stimuli. On the electrophysiological level, all three groups showed stronger negativity of the N1 over the left side for both spoken and whistled stimuli. This suggests that the left hemisphere played a crucial function in the perception, processing, and comprehension of whistled syllables. However, the behavioral data also suggest the involvement of right-hemispheric networks when processing whistled Spanish. Considering its potential clinical value, future research in this field, leveraging modern multimodal fusion approaches, is needed to further elucidate the neuronal mechanisms underlying the functional and structural asymmetries of whistled languages.

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**Emma Karlsson — Ghent University, Belgium**

**Title: Beyond the prototypical brain: investigating diversity in functional hemispheric segregation**

Several core cognitive networks in the human brain show marked left–right differences in their functional organization. While these asymmetries are well described at the level of individual functions, overarching patterns of variability in hemispheric functional organization across multiple domains have not been mapped in a representative sample. Addressing this gap, we explored the phenotypic diversity of hemispheric segregation patterns across four lateralized functions (language, tool-use, spatial attention, and face perception) at the individual level using fMRI. The sample included 100 left-handed and 100 right-handed individuals, carefully selected to represent the adult Flemish population, but with deliberate enrichment for left-handedness. We

challenge the traditional one-size-fits-all view of hemispheric organization by showing that deviations from the typical pattern of functional segregation are surprisingly common, occurring in about 60% of left-handers and 30% of right-handers. Mirrored brain organization was found exclusively in left-handers and more often than expected if lateralization were independent across functions. Critically, we found no evidence that the prototypical “textbook” pattern of brain organization confers any advantage in general cognitive ability. These results challenge the assumption of a single optimal brain organization and demonstrate that hemispheric functional segregation in humans is much more variable than previously anticipated.

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TUESDAY, FEBRUARY 24<sup>TH</sup> (1:10 – 2:10pm)

**Melanie Cohn — Krembil Brain Institute, University Health Network, Canada**

**Title: Characterizing Episodic Memory Impairment in Parkinson’s Disease: A Meta-Analytic Synthesis**

Memory impairment is common in Parkinson’s disease (PD) and often emerges before dementia onset. Despite its importance for cognitive diagnosis and prognosis, memory is frequently treated as a unitary construct in PD even though deficits can arise from fronto-executive dysfunction and, in some patients, from disruptions outside fronto-striatal circuits including the medial temporal lobes. The literature describing the characteristics and moderators of memory dysfunction remains fragmented. I will present findings from a large meta-analysis (~400 studies) aimed at providing a comprehensive characterization of expected episodic memory impairment. We concurrently examined multiple task features (e.g., encoding and retrieval task formats, modality, associative and semantic features of the material, and delay duration). We also assessed demographic and clinical predictors including age, sex, education, disease stage, disease duration, medication status, and medication dose. In addition, we reviewed performance in at risk subgroups including individuals with mild cognitive impairment, hallucinations, and gait disorder. Results indicate that younger age, female sex, and higher education are protective factors. Impairment is larger for recall than recognition and is more pronounced at short delays even when immediate memory was excluded. In contrast, several task characteristics including modality, encoding instructions, and associative or semantic features do not significantly moderate performance. Memory decline is linked to disease stages marked by the emergence of gait disorder but is not related to disease duration or dopaminergic medication dose. At risk subgroups show greater deficits, although even lower risk groups demonstrate reduced memory relative to controls. These findings clarify the nature and magnitude of episodic memory impairment in PD, identify factors associated with vulnerability or resilience, and offer guidance for selecting memory measures in clinical and research settings.

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**Nicole S. McKay — Washington University in St. Louis, USA (Prospective member)**

**Title: White matter microstructural degeneration correlates with tau spatial progression and cognition in Autosomal Dominant Alzheimer disease**

In Alzheimer disease (AD), tau impacts white matter microstructure through axonal injury from its prion-like spread. Tau accumulation and white matter microstructural decline prior to symptom onset, emphasizing their pivotal role in AD manifestation. Autosomal dominant AD (ADAD) has a relatively uniform phenotype that can be leveraged to investigate the preclinical relationship between tau, white matter, and cognitive decline. Those with ADAD exhibit early pathology with few age-related comorbidities, and the high penetrance of ADAD mutations enables precise disease staging relative to expected symptom onset. Using data from the Dominantly Inherited Alzheimer Network, we characterized tau pathology, white matter integrity, and cognition in ADAD mutation-carriers and non-carrier siblings. Whole-brain analyses indicated that symptomatic mutation-carriers have significantly different white matter microstructure compared to asymptomatic mutation-carriers and non-carriers. These abnormalities emerged following tau pathology but concurrently with progression in symptomatic status. In contrast, our tract-of-interest analyses observed changes within the cingulum bundle and uncinate fasciculus emerging five years prior to symptom onset. While global white matter differences are detected close to symptom onset, tracts that are adjacent

to regions of significant tau accumulation show microstructural abnormality much earlier. This confirms that ADAD white matter decline does not occur uniformly across the brain, and may suggest a spatial correlation with tau. Given that white matter is critically important for transduction and integration of signals across disparate brain regions, the characterization of tau and white matter progression may provide important insight into the mechanism through which tau drives cognitive symptom onset in ADAD.

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**Steven Greening — University of Manitoba, Canada**

**Title: Can patterns of inter-network connectivity be used to differentiate between reappraisal and passive viewing during emotion regulation?**

While literature on emotion regulation shows a recurring pattern of activation of the dorsolateral prefrontal cortex (dlPFC), ventrolateral prefrontal cortex (vlPFC), and dorsomedial prefrontal cortex (dmPFC), along with deactivation of the insula and the amygdala, research does not focus as much on inter-network functional connectivity during emotion regulation. The present study aims to determine whether the pattern of communication between intrinsic brain networks is distinct when one is reappraising versus passively viewing emotional scenes. The dlPFC, vlPFC, and dmPFC are often found in cognitive networks, such as the attention control network (ACN). On the other hand, the insula is associated with the salience network (SN) and the amygdala is associated with the limbic network. In addition, the default mode network (DMN) is believed to be associated with the processing of emotion and is less commonly discussed in studies of emotion regulation. We conducted a novel study that determined inter-network functional connectivity during reappraise and passive viewing tasks using univariate and multivariate fMRI methods in an N=31. I will present the results evaluating whether inter-network functional connectivity can predict whether one is reappraising or passively viewing at a rate greater than chance using leave-one-subject-out cross validation.

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TUESDAY, FEBRUARY 24<sup>TH</sup> (2:30 – 3:50pm)

**Sarah A. Grainger — The University of Queensland, Australia (Prospective member)**

**Title: Is the Age-Related Positivity Effect in Attention to Faces an Artefact of Traditional Lab Paradigms?**

There is a well-established age-related positivity effect in attention to emotional faces, whereby older adults look less at negative faces and/or more at positive faces relative to their younger counterparts. However, all of these studies have relied on traditional computer paradigms where individuals are directed to look at faces on a screen. The primary aim of this study was to test whether the age-related positivity effect emerges under more naturalistic circumstances. The secondary aim was to test whether an own-age bias exists in attention to emotional faces, and whether task ecological validity moderates any observed effect. In total, 49 older and 49 younger adults took part in this study. They completed a naturalistic positivity effect task that involved sitting in a mock waiting room with emotional faces on the walls while their eye movements were monitored with a wearable eye-tracker. They also completed a traditional positivity effect paradigm that involved viewing emotional faces on a computer screen while their eye-gaze was monitored. As predicted, a positivity effect emerged in the computer task whereby older adults looked less at negative faces compared to young, but no age-related positivity effect emerged in the naturalistic task, with older and younger adults showing almost equivalent allocation of gaze to the emotional faces. There was no evidence of an own-age bias in older adults – both groups looked longer at young faces and this effect was strongest in the naturalistic task. These findings highlight the importance of considering ecological validity in studies of emotional ageing.

**Julia Kam — University of Calgary, Canada**

**Title: Neurophysiological Mechanism underlying Attentional Switching**

The human capacity to flexibly allocate neural resources between external and internal attention states is essential for optimal performance in professional and everyday situations. Yet, the neurophysiological mechanisms that underpin such attentional switching remain underexplored. To address this, we examined intracranial electroencephalogram from several large-scale networks as participants performed an attention switching task. Our results indicate that the control networks -- fronto-parietal control network and ventral attention network -- were preferentially engaged during attentional switching, showing differential patterns of low frequency activity when switching to external or internal attention. Inter-network interactions were characterized by information flow from both control networks to attention networks -- dorsal attention network and default network -- across theta, alpha and beta during the moments of switching between external and internal attention. Importantly, they corresponded with subjective experiences of attentional switching, underscoring their functional significance. We further demonstrate that oscillatory power patterns across these four networks can successfully decode switching states and attention states. Taken together, these findings highlight the regulatory role of control networks in engaging relevant attention networks through low frequency oscillations as a core mechanism underlying the flexible allocation of attention to either our external environment or internal thoughts.

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**Julia Cox — University of Chicago, USA (Prospective member)**

**Title: An operant foraging task for mice to reveal the neural mechanisms of decision making**

Foraging, a behavior vital for survival, requires making choices based on expected outcomes. Foraging involves sequential decisions about which resources to pursue and which to forgo. These decisions involve integrating information about the benefit of consuming a resource and the cost of obtaining it. Despite the importance of this behavior, how cost and benefit information are processed in the brain to affect choice remains incompletely understood. To address this, we developed a new task for mice inspired by natural foraging decisions and well-suited to the investigation of the neural mechanisms of these choices. In this task, mice choose to pursue or reject offers with independently varying costs (nose poke hold time) and benefits (reward size). Mice make choices based on both features. Additionally, when we change how often mice encounter different offers, mice adjust their choices even though the cost and benefit of individual offers are unchanged. We are now using this task to test a model of the basal ganglia whereby the direct pathway computes information in favor of performing an action (benefit) while the indirect pathway computes information against performing an action (cost) by imaging activity in the two major cell types in the striatum, direct and indirect pathway spiny projection neurons using genetically encoded calcium indicators and a miniaturized, head mounted single-photon microscope. By independently varying cost, benefit and environmental value, our task provides a powerful context to disentangle how this information is encoded in the brain to regulate foraging behavior.

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**Ludise Malkova — Georgetown University Medical Center, USA;**

Authors: Ludise Malkova, Carleigh J. Turner, Patrick A. Forcelli.

**Title: Pharmacological Modulation of the Anterior Cingulate Cortex Affects Social Behavior in Macaques**

The anterior cingulate cortex (ACC) is a critical node within the brain circuit that controls social behavior across species. ACC consists of distinct anatomical and functional subdivisions, including the dorsal ACC sulcus (ACCs), dorsal ACC gyrus (ACCg), and subgenual ACC (sgACC), and these subregions contribute to different aspects of social behavior. Previous lesion studies in nonhuman primates showed impairment in processing of social stimuli after lesions of the ACCg but not after lesions of the ACCs, which impaired more general processing of reward (Rudebeck et al., 2006). Unlike permanent lesions, which typically result in loss of function, reversible pharmacological manipulations allow to assess the effects of both inhibition and activation of the targeted area. Using reversible pharmacological manipulations by intracerebral infusions into two of the ACC subregions (ACCs vs

ACCg), we aimed to determine the effects of inhibition versus disinhibition of these subregions in five dyads of freely moving pigtail macaques (*Macaca nemestrina*). The dyads were observed during the period of 60 minutes after the infusion of one of the animals, while the second animal in the dyad served as a non-infused partner. In contrast to the previous finding, ACCs activation by intracerebral infusions of the GABA-A antagonist bicuculline methiodide increased social interactions (e.g., grooming). Inhibition of both the ACCs and the ACCg (combined) by infusions of the GABA-A agonist muscimol decreased total social contact. These results contribute to the understanding of the complex circuitry underlying social interactions in primates.

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## **WORKS IN PROGRESS**

WEDNESDAY, FEBRUARY 25<sup>TH</sup> (10:30am – 11:50am)

**Alex Barnett — McGill University, Canada**

**Title: Event processing in epilepsy**

People with epilepsy often report dissatisfaction in their memory for experiences or events, but the neural underpinning of this kind of memory challenge is poorly understood. Episodic memory for complex events is dependent on hippocampal encoding processes and work using narrative stimuli has shown that hippocampal activity at the offset of events (“event boundaries”) is associated with better subsequent memory, in healthy adults. Here, we examined event boundary activity in epilepsy patients and controls using 3T and 7T fMRI to examine whether recurrent seizures alter this offset activity and its relationship to subsequent memory. We observed overall weaker hippocampal boundary activity in the patients compared to controls, but a sustained relationship between boundary activity and subsequent memory. I will outline future work to 1. Characterize memory deficits in a more detailed manner, 2. Look at the effects of seizure focus on these findings, and 3. Examine reinstatement and retrieval-based activity in patients compare to controls.

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**Natalie C. Ebner — McKnight Brain Institute; University of Florida, USA**

**Title: Dynamic Eye-Gaze Behavior in Naturalistic Face-to-Face Deception Detection: Leveraging Novel Dual Eye-Tracking Methodology in Older Adults**

Aging is associated with changes in evaluating choice-relevant social signals, such as eye-gaze, which may affect the ability to decide whether someone can be trusted. Current work is limited by static and artificial deception detection paradigms that cannot capture dynamic social signals occurring during naturalistic face-to-face interaction. Here we employ highly novel dual eye-tracking methodology in older adults during a naturalistic face-to-face poker-based deception task, Cheat, during which participants wear eye-tracking glasses, allowing synchronous capture of fine-grained visuo-attentional processing between two partners. We test whether (i) greater attention to the partner’s eyes and (ii) instances of shared eye contact increase deception detection accuracy in older adults, and whether (iii) these effects differ in same-age versus mixed-age contexts. The study comprises 60 older (60-85 years) and 30 young (18-35 years) adults, with equal numbers of older adults assigned to same-age (i.e., age-matched partner) and mixed-age (i.e., young partner) dyads, resulting in 30 same-age and 30 mixed-age dyads. Initial findings indicate a truth bias consistent with prior literature. Preliminary analyses further challenge previous reports in that older adults excel in this naturalistic, dynamic deception detection paradigm. We develop calibration and data quality guidelines and systematically analyze partner age effects on proportion of fixations to the eyes and shared eye contact on deception detection accuracy in dyadic multilevel models. This work validates use of dual eye-tracking in interactive paradigms to delineate neurocognitive mechanisms underlying deception detection in aging and advances understanding of dynamic social signals on deception detection in older adults.

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**Hicret Atilgan — Johns Hopkins University, USA**

**Title: Cerebellar Involvement in Alcohol Use Disorder**

Alcohol use disorder (AUD) involves disrupted reward circuitry, yet the role of cerebellar interactions with dopaminergic reward regions remains unclear. This ongoing study investigates how noninvasive brain stimulation influences these circuits using transcranial direct current stimulation (tDCS) combined with fMRI. Participants, including AUD and healthy controls, first complete a Monetary Incentive (MI) task in fMRI prior to any stimulation to assess baseline reward processing, revealing preliminary differences in cerebellar–ventral tegmental area (VTA) responses to reward anticipation, outcomes, and prediction errors between groups. Eyeblink conditioning (EBC)

data are collected beforehand, outside the scanner, as a measure of cerebellar integrity. Subsequently, participants complete three tDCS sessions (sham, anodal, cathodal), each including a resting-state scan and an alcohol cue-reactivity task to examine stimulation-dependent cerebellar–reward network activation and connectivity. fMRI analyses include task-related activation and functional connectivity using seed-to-voxel and psychophysiological interaction approaches, focusing on the cerebellum and key reward regions. Preliminary findings suggest that tDCS modulates cerebellar–reward region activation and connectivity differently in AUD versus controls, building on baseline group differences observed in the MI task and sham tDCS condition. These results aim to clarify mechanisms of disrupted cerebello–reward circuits in AUD and demonstrate the potential of noninvasive stimulation to probe and influence these networks.

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**Andrew Cotton, MD — Johns Hopkins University, USA**

**Title: Spinocerebellar ataxia patients have decreased language-related activity in the right cerebellum, but left cerebellar and neocortical activity correlates with task performance**

Preliminary fMRI analyses were performed to assess differences in language-related brain activity between a mixed sample of spinocerebellar ataxia patients (SCA; 14F, 8M) and controls (7F, 8M). Subjects completed two tasks: a modified Sternberg Task, which assesses verbal working memory, and a Word Segmentation Task, which assesses the ability to identify reoccurring syllable sequences (words) within a pseudo-language. We hypothesized that, relative to controls, SCA subjects would have decreased activity (voxel- $p < 0.001$ , cluster- $p$ -FDR  $< 0.05$ ) in the linguistic cerebellum and increased compensatory activity in neocortical areas. As expected, SCA subjects had significantly less activity in right lobule VI for the encoding phase of the Sternberg Task. Task accuracy negatively correlated with encoding-related activity for the SCA group in left lobule VIIIA as well as the left anterior superior temporal gyrus, the bilateral frontal cortices, basal ganglia, and occipital cortices. SCA subjects also had significantly less right lobule VI activity relative to controls during the recall phase of the Word Segmentation task. SCA task performance was not correlated with brain activity. While these results do suggest that activity was disrupted in the linguistic cerebellum for SCA patients, it appears that, contrary to our hypothesis, neocortical activity was also impaired. Since structural studies suggest that neocortical grey matter in many SCA types is usually only affected later in the course of the disease, if at all, application of neuromodulatory techniques to language areas in the neocortex could potentially increase compensatory activity and help alleviate cognitive symptoms. Supported by NIH/NIMH grant R01MH128278.

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WEDNESDAY, FEBRUARY 25<sup>TH</sup> (1:10 – 2:10pm)

**Magdalena Wojtowicz — York University, Canada**

**Title: Cognitive Foundations of Athletic Talent: Integrating Cognitive Profiling into a Statewide Athlete Identification Program**

Athletic performance emerges from the integration of physical, perceptual, and neural systems that support rapid decision-making and motor coordination under pressure. However, athlete identification programs have largely overlooked the neurocognitive capacities that enable these high-level behaviors. This project investigates the cognitive foundations of athletic talent within the Queensland Academy of Sport's YouFor2032 initiative, a prospective, longitudinal talent identification program preparing youth athletes for the Brisbane 2032 Olympic and Paralympic Games. The study aims to determine whether individual differences in core cognitive domains, attention, executive control, working memory, reasoning, and processing speed, predict athlete selection, sport specialization, and long-term development trajectories. Participants (ages 8–23 for Olympic, 13–30 for Paralympic sports) will complete the Creyos computerized cognitive battery, a validated platform optimized for high-functioning populations and sensitive to cognitive performance through reaction-time–based measures. Cognitive data will be integrated with demographic and physical performance metrics already collected by YouFor2032, enabling

multimodal analyses of how neurocognitive profiles align with physical skill acquisition and performance over time. By embedding cognitive methods within a naturalistic, large-scale sport context, this study represents a novel bridge between laboratory-based cognitive science and real-world athlete development. Findings are expected to identify cognitive markers of athletic potential, clarify their evolution with training and experience, and inform evidence-based, brain-centered models of athlete identification. Ultimately, this work aims to transform how cognitive science contributes to performance pathways, offering a scalable framework for data-driven, neurocognitively informed talent development.

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**Scott M. Hayes — The Ohio State University, USA**

**Title: Examining the association between cardiorespiratory fitness and pattern separation performance across the adult lifespan**

Aging is associated with declines in episodic memory. Cardiorespiratory fitness is modifiable via participation in aerobic-based exercises, such as walking, jogging, dancing, or swimming. There is evidence that cardiorespiratory fitness may attenuate age-related cognitive decline, yet a limited number of studies have examined the association between cardiorespiratory fitness and pattern separation performance, an important component episodic memory process for distinguishing similar stimuli. Adults (n = 209; 18-86 years; mean age = 51 years) completed progressive maximal exercise testing on a cycle ergometer to assess cardiorespiratory fitness and the mnemonic similarity task to assess pattern separation performance. Aging was associated with reductions in pattern separation performance. Cardiorespiratory fitness interacted with age and task difficulty (easy, medium, hard), such that among older adults, cardiorespiratory fitness was positively associated with pattern separation performance for the medium difficulty condition, but not the easy or hard conditions. The results suggest that higher fitness levels may help support the neural processes involved in distinguishing similar memories, which is a key aspect of episodic memory. Effects were only observed for medium difficulty items, indicating that items of easy and hard difficulty could be limited by ceiling and floor effects, respectively.

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**Anna S Mitchell — University of Canterbury, New Zealand**

**Title: The mediodorsal thalamus and cardiac variability during internal self-focused behaviours in mammals**

Recent evidence has identified that the mediodorsal thalamus (MD) influences internal (self) focused cognitive behaviours linked to the default mode network, a neural network in humans and other mammals that enables flexible switching between external and internal cognition. Internal self-focused cognitions are linked to physiology (e.g., heart rate changes). Heart rate variability impacts our thoughts and emotional processes and causes impulsive and apathy responses, hallmark symptoms of mental health conditions that impair learning and decision-making. Cardiac variability is modulated through a central autonomic network that includes the MD, basal forebrain and insular cortex. Yet, we do not know to what extent cardiac variability links the MD, insular cortex, and ventral striatum together to influence internal self-focused behaviours although it is crucial to unravel the mechanisms as they are substantially altered in chronic stress, anxiety and depression. Current work in our rat lab is recording neuronal signals between the MD, insular cortex, and striatal cholinergic interneurons along with ECG using implanted telemetry devices, before and after discrete manipulations to MD neurons while rats perform associative learning and decision-making tasks causally linked to MD. The overall hypothesis is that the MD modulates striatal cholinergic interneurons and insular neurons during internally focused cognitive states supporting optimal performance of complex daily tasks.