

controversies and anecdotes that occurred along the way.

He continued his work until a few short weeks ago – his 2021 publications continue to debate topics he was fascinated by including mind wandering, mental time travel, and the evolution of language, consciousness, and brain asymmetry.

Mike was an excellent teacher and an award-winning supervisor of graduate students. Many of his students are now professors themselves, in universities across the globe. He had a wonderful gift for engaging his students and his audience in his own mind wanderings, using humour and anecdotes to illustrate scientific concepts – he stopped teaching just a few years ago, explaining that “at my age it is more of a chat than a lecture”.

A knock on Mike’s door would always bring a friendly reply and a helpful response to your question – regardless of whether the question was major or minor, and regardless of whether the questioner was a first year student or another professor. He was unfailingly generous with his time.

Across six decades of service to the University, Michael Corballis was a distinguished researcher and teacher, a supportive mentor, a constructive collaborator and a valued friend to a large number of colleagues in the School of Psychology and beyond. He will be sorely missed.

#### **Dr. David Garron**

David Garron, Ph.D., ABPP CN passed away at home in Wilmette, Illinois on April 9 at the age of 90. He will be remembered as a founding figure in the history of neuropsychology and founding member of INS.

David remained proud of his Brooklyn roots throughout his life, particularly in the diversity of experiences and peoples there, and how this informed his later clinical career. After receiving his undergraduate degree at Brooklyn College and service in the US Army, he took advantage of the GI Bill to pursue his PhD at the University of Chicago where he studied under the leading figures in Psychology. Upon graduation and internship, he went to work at what was then Presbyterian-St. Luke’s Hospital in Chicago, which now is known as Rush University Medical Center and stayed there for some 40 years. By the mid 1960’s David had started one of the first training programs in neuropsychology in the country by initiating both pre-doctoral and post-doctoral training opportunities that continue until

this today at Rush. David was a founding member of the International Neuropsychological Society, and one of the earliest in our field to obtain board certification (ABPP-CN). He soon thereafter began to host the related oral examinations at Rush.

David is already remembered by generations of students as an extraordinarily intelligent clinician who relied not just on his vast knowledge of the literature related to neuroscience and psychopathology, but also of literature, philosophy, politics, art and music. He somehow made this knowledge relevant to his assessment and treatment of patients, and to the students he was training. He is remembered by many as saying “It’s simple, you must know everything”, and for his ability to elicit a patient’s story by looking at them over his glasses and saying “Oh?” He had a great gift for making the complicated look simple while reminding us that all of our patients are complicated and much more than a test score summary sheet. David is survived by his wife of over 60 years, Jane, and their three daughters, Rachel, Miriam and Rebecca. He will be remembered by the dozens he trained and educated and by the thousands he helped care for.

### **Symposium 03: Neural Correlates of Spontaneous Cognition and Implications for Adaptive and Maladaptive Cognition**

11:45am - 1:15pm

Thursday, 2nd February, 2023

Town & Country Ballroom C

#### **Chair**

Ruchika Prakash

The Ohio State University, Columbus, USA

#### **Summary Abstract:**

The empirical study of spontaneous cognitions— unprompted and unintentional explicit mental representations that come to mind spontaneously—has been gaining increasing traction in recent years. Humans spend half their waking time engaging in these spontaneous

cognitions or mind-wandering with studies providing support for mind-wandering to be linked with adaptive and maladaptive functional outcomes. However, despite this being a ubiquitous phenomenon, there is considerable debate in the literature on the definition of mind-wandering, associated neural correlates, and implications for cognitive and brain health. In this symposium, we bring together four presenters, who employ variegated experimental methods and definitions to understand the neural correlates of this elusive construct of mind-wandering. Through carefully designed methods, the four presenters also investigate the implications of engaging in task-unrelated thoughts for creativity, rumination, psychological health, and cognitive functioning in healthy and pathological aging.

Orwig et al. examine neural correlates of intentional vs. unintentional mind wandering. Their results support a differential involvement of posterior cortices in intentional mind wandering whereas unintentional mind wandering involved the top-down regulatory nodes of the prefrontal cortices. Interestingly, both intentional and unintentional mind wandering was associated with creative thinking thus providing support for mind wandering as an adaptive process.

Andrews-Hanna et al. have developed a novel think aloud technique where participants are asked to voice aloud their thoughts in real time across rest periods in the lab, the MRI scanner, and in participants own homes. Across several contexts, they found participants to show a high degree of similarity in resting thought. They also report significant individual differences content and dynamic characteristics of resting thought. Importantly, trait levels of rumination were associated with resting state thought patterns characteristic of brooding—negative, self-focused, and past-oriented thoughts. Individual differences in creativity, in contrast, were associated with loosely associative thoughts that exhibited a pattern of exploration.

Prakash & Teng demonstrate the first empirical test of a direct relationship between mind-wandering and fluid-based biomarkers of amyloid and tau pathology in 289 older adults from the Alzheimer's Disease Neuroimaging Initiative. The neuromarker of mind-wandering—representing edges associated with a high degree of off-task thinking—was positively

associated with a high CSF p-tau/A $\beta$ 42 ratio (indicative of higher levels of pathology). Moreover, network strength in the high mind-wandering model was also associated with lower global cognition, lower executive functioning, and episodic memory.

O'Callaghan et al. examine dysfunctional mind-wandering in neuropsychiatric diseases of aging: frontotemporal dementia, Alzheimer's disease, and Parkinson's disease. Employing a thought-sample task to probe mind-wandering, they show evidence of reduced mind-wandering in individuals with fronto-temporal dementia and Parkinson's disease. They also provide evidence that the hippocampal sharp wave-ripple is a compelling candidate for a brain state that can trigger mind-wandering episodes.

**Keyword 1:** awareness

**Keyword 2:** neuroimaging: functional connectivity

**Keyword 3:** cognitive functioning

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## 1 Neuromarker of Mind Wandering Predicts CSF-based Biomarkers of Amyloid and Tau Pathology

Ruchika Shaurya Prakash, James Teng  
The Ohio State University, Columbus, OH, USA

**Objective:** Mind-wandering—the spontaneous shift in attention away from the external task to internal thoughts (including daydreaming, fantasizing, rumination, and worrying)—is negatively associated with performance across a variety of tasks including the sustained attention to response task, the Stroop task, tasks of working memory, choice reaction time, visual search, as well as more ecologically related tasks like reading comprehension and mathematics. There has also been promising evidence suggesting a potential link between mind-wandering, functional connectivity of the canonical networks of the brain, and Alzheimer's disease (AD). However, no study has directly examined the relationship between neural correlates of mind-wandering and AD pathogenesis. In prior work, our lab has identified a whole-brain, functional connectivity-based marker of mind-wandering—the mwCPM—which predicted response time variability in older adults. In this study, we