CNS SAN FRANCISCO 2023

30 YEARS OF NEUROSCIENCE

Cognitive Neuroscience Society

30th Anniversary Meeting, March 25-28, 2023
Hyatt Regency Hotel, San Francisco, California

2023 Annual Meeting Program

Contents

A Supplement of the Journal of Cognitive Neuroscience
Cognitive Neuroscience Society
c/o Center for the Mind and Brain
267 Cousteau Place, Davis, CA 95616
ISSN 1096-8857 © CNS
www.cogneurosociety.org

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Schedule Overview

Saturday, March 25, 2023

10:00 am - 11:00 am		**Satellite Event — Opening the Door to Engagement with the National Science Foundation,** *Seacliff Room*
10:00 am - 6:00 pm		On-site Registration & Pre-Registration Check In, *Grand Ballroom Foyer*
11:00 am - 12:30 pm		**Data Blitz Session 1**, *Grand Ballroom A*
	CC	**Data Blitz Session 2**, *Grand Ballroom B/C*
		Data Blitz Session 3, *Bayview Room*
11:00 am - 3:00 pm		Exhibitor Check In, *Pacific Concourse*
12:30 - 1:00 pm		Poster Session A Set-Up, *Pacific Concourse*
1:00 - 3:00 pm	CC	**CNS at 30: Perspectives on the Roots, Present, and Future of Cognitive Neuroscience**, *Grand Ballroom*
3:00 - 3:30 pm		Coffee Service, *Pacific Concourse*
3:00 - 5:00 pm		**Poster Session A**, *Pacific Concourse*
3:00 - 6:00 pm		Exhibits Open, *Pacific Concourse*
5:00 - 6:00 pm	CC	**Opening Ceremonies & Keynote Address** - Poverty and Neuroscience: A Fish and a Bicycle?, **Martha J. Farah**, *University of Pennsylvania*, *Grand Ballroom*
5:30 - 6:00 pm		Poster Session A Take-Down, *Pacific Concourse*
6:00 pm		Exhibit Hall Closed for the Day – No Entry
6:00 - 7:00 pm		**Welcome Reception**, *Atrium*
8:00 - 11:00 pm		**30th Anniversary Dance Party** (DJ 8-9:30; Pavlov's Dogz 9:30-11), *Grand Ballroom*

Sunday, March 26, 2023

7:30 - 8:00 am		Exhibit Hall Access for Exhibitors/Poster Session B Set-up Only, *Pacific Concourse*
7:30 am - 6:30 pm		On-site Registration & Pre-Registration Check In, *Grand Ballroom Foyer*
8:00 - 8:30 am		Continental Breakfast, *Pacific Concourse*
8:00 - 10:00 am		**Poster Session B**, *Pacific Concourse*
8:00 am - 7:15 pm		Exhibits Open, *Pacific Concourse*
10:00 am - 12:00 pm	CC	**Invited Symposium 1 — Electrophysiological Studies of Human Memory Retrieval**, Nanthia Suthana, Chair, *Grand Ballroom A*
▶ 10:00 - 10:08 am		Introduction
▶ 10:08 - 10:36 am		**Talk 1**: Hippocampal-Prefrontal Representations Differentiate Outcomes that Vary by Context, Neal Morton
▶ 10:36 - 11:04 am		**Talk 2**: Memory Prediction and Reactivation in Human Electrophysiology, Nicholas Turk-Browne
▶ 11:04 - 11:32 am		**Talk 3**: Dynamic Neurophysiological Representations of Memory During Real-World Navigation in Humans, Nanthia Suthana
▶ 11:32 am - 12:00 pm		**Talk 4**: Schema, Drift, and Episodic Boundaries: A New Look at Primacy Effects in Free Recall, Bradley Lega
10:00 am - 12:00 pm		**Invited Symposium 2 — Learning and Generalization in Humans and Machines**, Anna Schapiro, Chair, *Grand Ballroom B/C*
▶ 10:00 - 10:08 am		Introduction
▶ 10:08 - 10:36 am		**Talk 1**: How to Organise Knowledge for Flexible Behaviour, James Whittington
▶ 10:36 - 11:04 am		**Talk 2**: Discovering Abstractions that Bridge Perception, Action, and Communication, Judy Fan
▶ 11:04 - 11:32 am		**Talk 3**: Symbols and Compositionality in Large Artificial Neural Networks, Ellie Pavlick
▶ 11:32 am - 12:00 pm		**Talk 4**: How Well Do Unsupervised Learning Algorithms Explain Actual Human Learning?, Dan Yamins
11:30 - 11:45 am		Poster B Take-Down, *Pacific Concourse*
12:00 - 1:30 pm		Lunch Break (On your own)
12:15 - 1:15 pm	CC	**DEI Workshop — Colors of the Brain: Recommendations for Serving Students from Historically Marginalized Groups in Neuroscience**, *Bayview Room*
1:30 - 2:00 pm		Poster C Set-Up, *Pacific Concourse*

1:30 - 3:30 pm **Symposium 1 — Stable Perception in the Wavering Brain - Reconciling Perceptual Stability with Dynamic Neuronal Representations**, Leon Deouell, Chair, *Bayview Room*

- 1:30 - 1:38 pm Introduction
- 1:38 - 2:04 pm **Talk 1**: Dynamic Reorganization of Neuronal Activity Patterns in Parietal Cortex, Laura N. Driscoll
- 2:04 - 2:30 pm **Talk 2**: Communication Subspaces: A Mechanism for Flexible Interareal Signaling, Adam Kohn
- 2:30 - 2:56 pm **Talk 3**: Stable Conscious Experience is Represented by Time-Invariant Neural Patterns, Leon Y Deouell
- 2:56 - 3:22 pm **Talk 4**: Relational Coding Underlies the Stability of Perceptual Content in Human Visual Cortex, Rafael Malach
- 3:22 - 3:30 pm Q&A with the Audience

1:30 - 3:30 pm **Symposium 2 — 'Stop Thinking About It!': Cognitive and Neural Mechanisms of the Removal and Inhibition of Information in Memory**, Marie Banich, Chair, *Grand Ballroom A*

- 1:30 - 1:38 pm Introduction
- 1:38 - 2:04 pm **Talk 1**: Removal of Information from Working Memory Via Three Distinct Mechanisms, Marie Banich
- 2:04 - 2:30 pm **Talk 2**: Directed Forgetting within Working Memory: Evidence for Successful Removal and an Active Mechanism, Sara Festini
- 2:30 - 2:56 pm **Talk 3**: Disentangling Cognitive and Neural Mechanisms of Intentional Forgetting in Long-term Memory, Lili Sahakyan
- 2:56 - 3:22 pm **Talk 4**: Active Forgetting of Unwanted Memories via Global Hippocampal Suppression, Michael Anderson
- 3:22 - 3:30 pm Q&A with the Audience

1:30 - 3:30 pm **Symposium 3 — The Data Science Future of Cognitive Neuroscience**, Bradley Voytek, Chair, *Seacliff Room*

- 1:30 - 1:38 pm Introduction
- 1:38 - 2:04 pm **Talk 1**: Neuromaps: Structural and Functional Interpretation of Brain Maps, Justine Hansen
- 2:04 - 2:30 pm **Talk 2**: Data-Driven Mapping and Validation of a Framework for Human Brain Function, Ellie Beam
- 2:30 - 2:56 pm **Talk 3**: The BRAIN Initiative Cell Census and Cell Atlas Networks, Michael Hawrylycz
- 2:56 - 3:22 pm **Talk 4**: CogNèuro GO: Capturing Synchronized Neural and Experiential Data in the Wild, Cory Inman
- 3:22 - 3:30 pm Q&A with the Audience

1:30 - 3:30 pm **Symposium 4 — Beyond the Brain: Tracking Mind and Brain through the Periphery**, Freek van Ede, Chair, *Grand Ballroom B/C*

- 1:30 - 1:38 pm Introduction
- 1:38 - 2:04 pm **Talk 1**: Sensory Saliency at the Tip of Your Fingers: Evidence from Isometric Force Recordings, Giacomo Novembre
- 2:04 - 2:30 pm **Talk 2**: Eye Movements as a Window on Temporal Expectations, Shlomit Yuval-Greenberg
- 2:30 - 2:56 pm **Talk 3**: Peripheral Motor Measures as a Window into the Fronto-Subthalamic Inhibitory Control Circuit, Benjamin O. Rangel
- 2:56 - 3:22 pm **Talk 4**: Microsaccades as a window into the role of the brain's oculomotor system in internal selective attention, Baiwei Liu
- 3:22 - 3:30 pm Q&A with the Audience

3:30 - 4:00 pm Coffee Break, *Ballroom Foyer*

4:00 - 5:00 pm **29th Annual George A. Miller Prize in Cognitive Neuroscience Lecture, "Everyone knows what attention is …" – On its neural basis in the primate brain**, Sabine Kastner, Princeton University, *Grand Ballroom*

5:00 - 7:00 pm **Poster Session C**, *Pacific Concourse*

7:00 - 7:15 pm Poster Session C Take-Down, *Pacific Concourse*

7:15 pm Exhibit Hall Closed for the Day – No Entry

Monday, March 27, 2023

7:30 - 8:00 am Exhibit Hall Access for Exhibitors/Poster Session D Set-Up Only, *Pacific Concourse*

8:00 am - 5:30 pm On-site Registration & Pre-Registration Check In, *Grand Ballroom Foyer*

8:00 - 8:30 am Continental Breakfast, *Pacific Concourse*

8:00 - 10:00 am **Poster Session D**, *Pacific Concourse*
8:00 am - 5:45 pm Exhibits Open, *Pacific Concourse*
8:30 - 10:00 am Communications Open House (Light refreshments will be available), Press Room, *Regency A*
10:00 am - 12:00 pm CC **Symposium 5 — Can't Stop Won't Stop: Statistical Learning Persists through Development, Brain Damage and Competing Demands**, Laura Batterink, Chair, *Grand Ballroom B/C*
- 10:00 - 10:08 am Introduction
- 10:08 - 10:34 am **Talk 1**: The Neurobiology of Auditory Statistical Learning is More Domain-Specific Early in Life, Zhenghan Qi
- 10:34 - 11:00 am **Talk 2**: The Developing Brain Represents Specific and Group Level Regularities Differently, Amy Finn
- 11:00 - 11:26 am **Talk 3**: Statistical Learning does not Require the Dentate Gyrus, Laura Batterink
- 11:26 - 11:52 am **Talk 4**: Learning from Abstract Regularities in the Hippocampus and Visual Cortex, Brynn Sherman
- 11:52 am - 12:00 pm Q&A with the Audience

10:00 am - 12:00 pm **Symposium 6 — Neurocomputational Accounts of Agency**, Ivan Grahek, Chair, *Seacliff Room*
- 10:00 - 10:08 am Introduction
- 10:08 - 10:34 am **Talk 1**: Neurocomputational Mechanisms of Agency-Modulated Reward Learning, Hayley Dorfman
- 10:34 - 11:00 am **Talk 2**: Neural Dynamics Underlying Updating and Adaptation to Changes in Performance Efficacy, Ivan Grahek
- 11:00 - 11:26 am **Talk 3**: Controllability and Goal-Directedness, Mimi Liljeholm
- 11:26 - 11:52 am **Talk 4**: Inter-Agent Empowerment as Social Incentive and the Three Laws of Robotics, Daniel Polani
- 11:52 am - 12:00 pm Q&A with the Audience

10:00 am - 12:00 pm **Symposium 7 — Events and Their Boundaries: A Developmental Perspective**, Susan Benear, Chair, *Bayview Room*
- 10:00 - 10:08 am Introduction
- 10:08 - 10:34 am **Talk 1**: Setting Boundaries: Development of Neural and Behavioral Event Cognition in Early Childhood, Susan Benear
- 10:34 - 11:00 am **Talk 2**: Linking perceptual and semantic predictability to patterns of event segmentation in development, Andrei Amatuni
- 11:00 - 11:26 am **Talk 3**: Spatial Boundaries and the Development of Episodic Memory Structure, Sang Ah Lee
- 11:26 - 11:52 am **Talk 4**: Beyond the Boundaries: Event Model Maintenance Across Development, Erika Wharton-Shukster
- 11:52 am - 12:00 pm Q&A with the Audience

10:00 am - 12:00 pm CC **Symposium 8 — From Observed Experience to Concepts: Multiple Views on the Mechanisms of Concept Formation in the Human Brain**, Anna Leshinskaya, Chair, *Grand Ballroom A*
10:00 - 10:08 am Introduction
- 10:08 - 10:34 am **Talk 1**: Inferring Representational Abstraction from Plasticity Patterns in those Born Blind or Without Hands, Ella Striem-Amit
- 10:34 - 11:00 am **Talk 2**: Multimodal Object Representations Rely on Integrative Coding, Morgan Barense
- 11:00 - 11:26 am **Talk 3**: Relational Encoding Drives Sensory Abstraction in Lateral Temporal Cortex, Anna Leshinskaya
- 11:26 - 11:52 am **Talk 4**: The Effects of Early-Life Language Experience in Deriving Neural Semantic Representations, Yanchao Bi
- 11:52 am - 12:00 pm Q&A with the Audience

11:30 - 11:45 am Poster Session D Take-Down, *Pacific Concourse*
12:00 - 1:30 pm Lunch Break (On your own)
12:15 - 1:15 pm CC **Workshop — Industry Professional Development Panel**, *Bayview Room*
12:15 - 1:15 pm **Workshop — Recording What Happened during your experiment using Hierarchical Event Descriptors (HED)**, *Seacliff Room*
1:30 - 2:00 pm Poster Session E Set-Up, Pacific Concourse
1:30 - 2:00 pm CC **YIA 1 — Learning Representations of Specifics and Generalities Over Time**, Anna Schapiro, *Grand Ballroom A*
2:00 - 2:30 pm CC **YIA 2 — Focusing Working Memory for Behaviour**, Freek van Ede, *Grand Ballroom A*
2:30 - 4:30 pm **Poster Session E**, *Pacific Concourse*

3:30 - 4:00 pm Coffee Service, *Pacific Concourse*
4:30 - 5:30 pm CC **12th Annual Fred Kavli Distinguished Career Contributions in Cognitive Neuroscience Lecture, A Tale About the Frontal Lobes as told by a Neurologist**, Mark D'Esposito, University of California, Berkeley, *Grand Ballroom*
5:30 - 5:45 pm Poster Session E Take-Down, *Pacific Concourse*
5:45 - 7:15 pm **8th Annual CNSTA Professional Development Panel for Trainees**, *Bayview Room*
5:45 pm Exhibit Hall Closed for the Day – No Entry
7:30 - 10:00 pm CNS Student Trainee Social Night, *Monroe's Bar*

Tuesday, March 28, 2023

7:30 am - 8:00 am Exhibit Hall Access for Exhibitors/Poster Session F Set-Up Only, *Pacific Concourse*
8:00 am - 3:00 pm On-site Registration & Pre-Registration Check In. *Grand Ballroom Foyer*
8:00 - 8:30 am Continental Breakfast, *Pacific Concourse*
8:00 - 10:00 am **Poster Session F**, *Pacific Concourse*
8:00 am - 12:00 pm Exhibits Open, *Pacific Concourse*
10:00 am - 12:00 pm **Invited Symposium 3 — Fulfilling the Promise of Inhibitory Control: Bridging the Gap Between Motor and Cognitive Inhibition**, Jan R. Wessel, Chair, *Grand Ballroom A*

- 10:00 - 10:08 am Introduction
- 10:08 - 10:36 am **Talk 1**: The Universal Role of Inhibitory Control in Flexible Behavior and Cognition, Jan R. Wessel
- 10:36 - 11:04 am **Talk 2**: Top-Down Control by Beta Rhythms, Earl K. Miller
- 11:04 - 11:32 am **Talk 3:** Recruitment of Domain-General Inhibitory Control Supports Suppression of Encoding of Episodic Memories, Ryan J. Hubbard & Lili Sahakyan
- 11:32 am - 12:00 pm **Talk 4**: A Common Brain Mechanism for Stopping Unwanted Actions and Memories, Dace Apšvalka

10:00 am - 12:00 pm CC **Invited Symposium 4 — Paths to Increased Brain-Behavior Reproducibility**, Nico Dosenbach, Chair, *Ballroom B/C*

- 10:00 - 10:08 am Introduction
- 10:08 - 10:36 am **Talk 1:** Brain-Wide Association Studies: A Year in Review, Scott Marek
- 10:36 - 11:04 am **Talk 2**: Considerations for Improving Measurement Reliability and Validity in fMRI, Stephanie Noble
- 11:04 - 11:32 am **Talk 3**: Insights From Large-Scale Datasets for Optimizing Study Design and Boosting Prediction Accuracy, Thomas Yeo
- 11:32 am - 12:00 pm **Talk 4**: Improving Robustness and Interpretability in Brain-Behavior Modeling, Russ Poldrack

11:45 am - 12:00 pm Poster Session F Take-Down, *Pacific Concourse*
12:00 pm Exhibit Hall Closed for the Day – No Entry
12:00 - 1:30 pm Lunch Break (On your own)
1:30 - 3:30 pm **Symposium 9 — In Memoriam Leslie G. Ungerleider (1946-2020),** Sabine Kastner, Chair, *Grand Ballroom B/C*

- 1:30 - 1:38 pm Introduction
- 1:38 - 2:04 pm **Talk 1**: Primate Parallel Pathways in Visual Areas and Beyond, Helen Barbas
- 2:04 - 2:30 pm **Talk 2**: The Essential Interaction of Function and Anatomy in Primate Vision, Chris Baker
- 2:30 - 2:56 pm **Talk 3**: On the Relevance of Gamma Oscillations for Figure-Ground Segregation in Visual Textures, Peter De Weerd
- 2:56 - 3:22 pm **Talk 4**: Face Patches and Circuitry in Human and Non-Human Inferotemporal Cortex, Marlene Behrmann
- 3:22 - 3:30 pm Q&A with the Audience

1:30 - 3:30 pm CC **Symposium 10 — The Brain is Complex: Have we Been Studying it all Wrong?,** Brad Postle, Chair, *Grand Ballroom A*

- 1:30 - 1:38 pm Introduction
- 1:38 - 2:04 pm **Talk 1:** The Entangled Brain, Luiz Pessoa
- 2:04 - 2:30 pm **Talk 2**: A Perspective from Network Neuroscience, Lucina Uddin
- 2:30 - 2:56 pm **Talk 3**: Modular Brain, Entangled Argument, John Krakauer
- 2:56- 3:22 pm **Talk 4**: Not Every Thing Must Go, Felipe De Brigard

- ▶ 3:22 - 3:30 pm Q&A with the Audience

1:30 - 3:30 pm CC **Symposium 11 — Altered States of Cognition: The Acute and Persisting Consequences of Psychedelic Drugs on Cognition**, Manoj Doss, Chair, *Bayview Room*

- ▶ 1:30 - 1:38 pm Introduction
- ▶ 1:38 - 2:04 pm **Talk 1**: LSD-Altered Spatial Cognition with Tetrode Recording of Hippocampal Place Cells, Carli Domenico
- ▶ 2:04 - 2:30 pm **Talk 2**: The Current State of Research on the Impact of Psychedelics on Episodic Memory, Manoj Doss
- ▶ 2:30 - 2:56 pm **Talk 3**: Spontaneous and Deliberate Creative Cognition During and After Psilocybin Exposure, Natasha L Mason
- ▶ 2:56 - 3:22 pm **Talk 4**: Beliefs, Psychedelics, and the Brain, Philip Corlette
- ▶ 3:22 - 3:30 pm Q&A with the Audience

1:30 - 3:30 pm **Symposium 12 — Methodological Advances in the Study of Autobiographical Memory**, Roni Setton, Chair, *Seacliff Room*

- 1:30 - 1:38 pm Introduction
- ▶ 1:38 - 2:04 pm **Talk 1**: Age and Individual Differences in Autobiographical Memory Relate to Default Network Connectivity, Roni Setton
- ▶ 2:04 - 2:30 pm **Talk 2**: Autobiographical Memory Recall in a Spontaneous Flow of Thoughts, Hongmi Lee
- ▶ 2:30 - 2:56 pm **Talk 3**: New Insights into the Link Between Visual and Mnemonic Processing during Autobiographical Retrieval, Signy Sheldon
- ▶ 2:56 - 3:22 pm **Talk 4**: Event-Level Neural Representations as a Window to the Content of Past Episodes, Asieh Zadbood
- ▶ 3:22 - 3:30 pm Q&A with the Audience

Keynote

Martha J. Farah, Ph.D.

Walter H. Annenberg Professor of Natural Sciences, University of Pennsylvania

Keynote Address, Open to the Public

Saturday, March 25, 2023, 5:00PM - 6:00PM, Grand Ballroom

Poverty and Neuroscience: A Fish and a Bicycle?

Does neuroscience have anything useful to contribute to our understanding of poverty and its harmful effects? Early work indicates that it may, despite the very different concepts appropriate for describing poverty or socioeconomic status more generally (income, educational attainment, and occupational status) and the brain (regions, networks, and neurotransmitters). To assess the prospects for fruitful interdisciplinary integration, I will first take you on a flyby of recent work on the neuroscience of socioeconomic status, sampling the questions that have been asked and the answers that are emerging. I will then consider the potential policy implications of this work, as well as scientific challenges and limitations and the worries expressed by some concerning reductionism and victim-blaming.

About

Martha Julia Farah is a cognitive neuroscience researcher at the University of Pennsylvania. She has worked on an unusually wide range of topics; the citation for her lifetime achievement award from the Association for Psychological Science states that “Her studies on the topics of mental imagery, face recognition, semantic memory, reading, attention, and executive functioning have become classics in the field.”

Farah has undergraduate degrees in Metallurgy and Philosophy from MIT, and a doctorate in Psychology from Harvard University. She has taught at Carnegie Mellon University and at the University of Pennsylvania, where she is now Walter H. Annenberg Professor of Natural Sciences and Director of the Center for Neuroscience & Society. Wikipedia®

George A. Miller Prize

Congratulations to Sabine Kastner for being awarded this honor!

Sabine Kastner will accept this prestigious award and deliver her lecture on Sunday, March 26, 2023, 4:00 – 5:00 pm, in the Grand Ballroom.

"Everyone Knows What Attention is …" – On its Neural Basis in the Primate Brain

Sabine Kastner, Ph.D.

Princeton University

The selection of information from our cluttered sensory environments, often referred to as 'attention', is one of the most fundamental cognitive operations performed by the primate brain. In the visual domain, the selection process is thought to be mediated by a spatial mechanism – a 'spotlight' that can be flexibly shifted around the visual scene. In my lecture, I will provide an overview on its neural basis by discussing neuroimaging and intracranial electrophysiology studies in the human and monkey brain. Neuroimaging studies have shown that the spatial selection mechanism engages a large-scale network that consists of multiple nodes distributed across all major cortical lobes and includes also subcortical regions in the midbrain and thalamus. Electrophysiology studies have provided a rich understanding of the specific functions of each network node and their functional interactions. Key findings reveal that (i) the cortical network is coordinated by a thalamic timekeeper in the pulvinar and (ii) processing in sensory cortex is modulated by feedback signals from a fronto-parietal control network. The fronto-parieto-pulvinar network is characterized by complex temporal dynamics that set up alternating attentional states, which emphasize either environmental sampling of information or shifting of spatial selection to a new location and can be measured as behavioral rhythms. Collectively, these studies in the adult brain set the stage for translational applications such as exploring the typical and atypical development of attention function and its deficits in neurological and psychiatric diseases.

About the George A. Miller Prize in Cognitive Neuroscience

The George A. Miller Prize in Cognitive Neuroscience was established in 1995 by the Cognitive Neuroscience Society to honor the innovative scholarship of George A. Miller, whose many theoretical advances have greatly influenced the discipline of cognitive neuroscience. The first ten years of the prize were funded by generous support from the James S. McDonnell Foundation.

Each year the Prize shall recognize an individual whose distinguished research is at the cutting-edge of their discipline with realized or future potential, to revolutionize cognitive neuroscience. Extraordinary innovation and high impact on international scientific thinking should be a hallmark of the recipient's work.

An annual call for nominations for the George A. Miller Prize will be made to the membership of the society. The recipient of the prize will attend the annual meeting of the Cognitive Neuroscience Society and deliver the George A. Miller lecture.

Previous Winners of the George A. Miller Lectureship

2022	BJ Casey, Ph.D., Yale University
2021	Elizabeth Phelps, Ph.D., Harvard University
2020	Nancy Kanwisher, Ph.D, Massachusetts Institute of Technology
2019	Earl K. Miller, Ph.D., Massachusetts Institute of Technology
2018	Elizabeth Spelke, Ph.D., Harvard University
2017	Dr. David Van Essen, Ph.D., Washington University in St Louis
2016	Brian Wandell, Isaac and Madeline Stein Family Professor
2015	Patricia Kuhl, Ph.D., University of Washington
2014	Jon Kaas, Ph.D., Vanderbilt University
2013	Fred Gage, Ph.D., The Salk Institute
2012	Eve Marder, Ph.D., Brandeis University
2011	Mortimer Mishkin, Ph.D., NIMH
2010	Steven Pinker, Ph.D., Harvard University
2009	Marcus Raichle, Ph.D., Washington University School of Medicine
2008	Anne Treisman, Ph.D., Princeton University
2007	Joaquin M. Fuster, Ph.D., University of California Los Angeles
2006	Steven A. Hillyard, Ph.D., University of California San Diego
2005	Leslie Ungerleider, Ph.D., National Institute of Mental Health
2004	Michael Posner, Ph.D., University of Oregon
2003	Michael Gazzaniga, Ph.D., Dartmouth College
2002	Daniel Kahneman, Ph.D., Princeton University
2001	William Newsome, Ph.D., Stanford University
2000	Patricia Churchland, Ph.D., University of California, San Diego
1999	Giacommo Rizzolatti, Ph.D., University of Parma, Italy
1998	Susan Carey, Ph.D., New York University
1997	Roger Shepard, Ph.D., Stanford University
1996	David Premack, Ph.D., CNRS, France
1995	David H. Hubel, Ph.D., Harvard Medical Schoo

The Fred Kavli Distinguished Career Contributions Award

Congratulations to Mark D'Esposito for being awarded this honor!

Mark D'Esposito will accept this prestigious award and deliver his lecture on Monday, March 27, 2023, 4:30 – 5:30 pm, in the Grand Ballroom.

A Tale About the Frontal Lobes as Told by a Neurologist

Mark D'Esposito, MD

Distinguished Professor of Neuroscience and Psychology University of California, Berkeley

A full understanding of frontal lobe function continues to elude neurologists and neuroscientists. Neurologists caring for patients with frontal lobe damage describe dramatic changes in their cognition and personality. Cognitive neuroscientists who study healthy individuals in the lab have discovered various frontal lobe functions, such as working memory, inhibition, and cognitive flexibility. Do the findings in the lab explain the real-life impact of frontal lobe damage? Can we ever develop a theory of frontal lobe function without incorporating clinical observations of individuals with frontal lobe damage? Through the lens of the neurological patients I have encountered and from what I have learned in my lab, I will attempt to answer these crucial questions.

About the Distinguished Career Contributions Award

The Fred Kavli Distinguished Career Contributions Award (DCC) was established in 2012 and it is sponsored by the Fred Kavli Foundation from 2019-2023. This award honors senior cognitive neuroscientists for their sustained and distinguished career, including outstanding scientific contributions, leadership and mentoring in the field of cognitive neuroscience.

An annual call for nominations for the Fred Kavli Distinguished Career Contributions Award will be made to the membership of the society. The recipient of the prize will attend the annual meeting of the Cognitive Neuroscience Society and deliver the Fred Kavli Distinguished Career Contributions lecture.

Previous Winners of the Distinguished Career Contributions Award

2022	John Jonides, Ph.D., University of Michigan
2021	Robert Desimone, Ph.D., McGovern Institute for Brain Research at MIT
2020	Marlene Behrmann, Ph.D., Carnegie Mellon University
2019	Daniel L. Schacter, Ph.D., Harvard University
2018	Alfonso Caramazza, Harvard University
2017	Marcia K. Johnson, Yale University
2016	James Haxby, University of Trento
2015	Marta Kutas, Ph.D., University of California, San Diego
2014	Marsel Mesulam, M.D., Northwestern University
2013	Robert T. Knight, M.D., University of California, Berkeley
2012	Morris Moscovitch, Ph.D., University of Toronto

THE KAVLI FOUNDATION

Young Investigator Award

Congratulations to the 2023 Young Investigator Award Winners

Anna Schapiro, Ph.D., University of Pennsylvania
Freek van Ede, Ph.D., Vrije Universiteit Amsterdam

YIA special lectures take place on Monday, March 27, 2023, 1:30 – 2:30 pm, in the Grand Ballroom A at the Hyatt Regency San Francisco.

The purpose of the awards is to recognize outstanding contributions by scientists early in their careers. Two awardees, one male and one female, are named by the Awards Committee, and are honored at the CNS annual meeting. Each award includes $500 US to be used by the winners toward travel costs to the meeting, or for any other purpose.

Learning Representations of Specifics and Generalities Over Time

Monday, March 27, 2023, 1:30 –2:00 pm, Grand Ballroom A

Anna Schapiro, Ph.D.

University of Pennsylvania

There is a fundamental tension between storing discrete traces of individual experiences, which allows recall of particular moments in our past without interference, and extracting regularities across these experiences, which supports generalization and prediction in similar situations in the future. One influential proposal for how the brain resolves this tension is that it separates the processes anatomically into Complementary Learning Systems, with the hippocampus rapidly encoding individual episodes and the neocortex slowly extracting regularities over days, months, and years. But this does not explain our ability to learn and generalize from new regularities in our environment quickly, often within minutes. We have put forward a neural network model of the hippocampus that suggests that the hippocampus itself may contain complementary learning systems, with one pathway specializing in the rapid learning of regularities and a separate pathway handling the region's classic episodic memory functions. This proposal has broad implications for how we learn and represent novel information of specific and generalized types, which we test across statistical learning, inference, and category learning paradigms. We also explore how this system interacts with slower-learning neocortical memory systems, with empirical and modeling investigations into how the hippocampus shapes neocortical representations during sleep. Together, the work helps us understand how structured information in our environment is initially encoded and how it then transforms over time.

Focusing Working Memory for Behaviour

Monday, March 27, 2023, 2:00 –2:30 pm, Grand Ballroom A

Freek van Ede, Ph.D.

Institute for Brain and Behavior Amsterdam, Department of Experimental and Applied Psychology, Vrije Universiteit Amsterdam, The Netherlands

Working memory regards the past but serves the future. Adopting this future-focused perspective shifts the narrative of working memory as a temporary storage with limited capacity to working memory as an anticipatory buffer that enables us to prepare for potential and sequential upcoming behaviour. In such a framework, selective attention plays a vital role because it serves not only to bring selected information into working memory but also to dynamically prioritise internal representations for guiding anticipated behaviour. In my talk, I will present a series of our recent studies that have started to reveal emerging principles of a working memory that looks forward – highlighting, amongst others, how working memory incorporates actions rather than merely preceding them. Collectively, these studies show how studying the dynamics of working memory, selective attention, and action together paves way for a rich and integrated understanding of how mind serves behaviour.

CHEN TIANQIAO & CHRISSY INSTITUTE

JoCN Travel Fellowship Award

Congratulations to the 2023 Award Winners

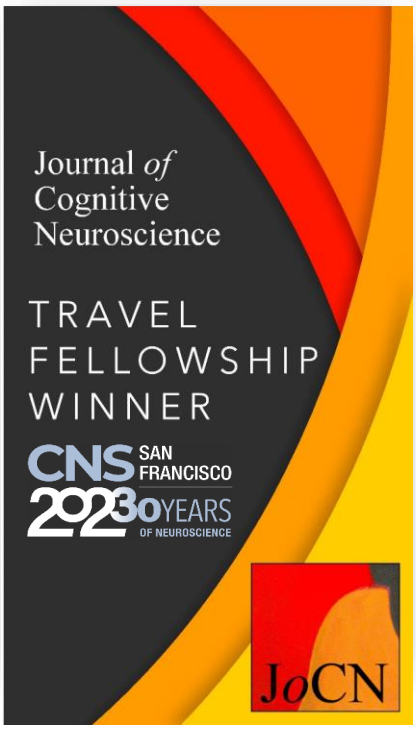
Christine A. Leonards, The University of Melbourne, Parkville,Victoria, Australia

Zeguo Qiu, The University of Queensland

Veena Kander, University of Cape Town, South Africa

Kenneth Oparaji, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria

The annual meeting of the Cognitive Neuroscience Society typically enjoys robust attendance from individuals from institutions based in the US and Canada, Europe, and Northeast Asia. To help promote geographic diversity in our science, the Journal of Cognitive Neuroscience has teamed up with CNS to create the JoCN Travel Fellowship, which provides a travel stipend of $3000, plus waived conference registration and waived poster submission fee, to one trainee from each of four regions that have been underrepresented at the CNS conference: Oceania and Southeast Asia; South Asia; Africa and West Asia; and Western Hemisphere (minus US and Canada).



Southeast Asia & Oceania

"Altered task-induced activity and functional connectivity in the frontocingulate cortex as a marker of depression and treatment response"

Christine A. Leonards, *Melbourne Neuropsychiatry Centre, Department of Psychiatry, The University of Melbourne, Parkville,Victoria, Australia*

"Where is Wally and How Quickly Do We Know It? Fixation-related Electrical Potentials during a Free Visual Exploration Task Reveal the Timing of Visual Awareness"

Zeguo Qiu, *The University of Queensland*

South Asia

"Effect of Agenesis and damage of Corpus Callosum on Visual Memory"

Prerna Dash, *Department of Human Development and Childhood Studies, Institute of Home Economics, University of Delhi*

Africa & West Asia

"Online paediatric EEG handbook: a survey on its usefulness"

Veena Kander, *Department of Neurophysiology, University of Cape Town, South Africa*

"Mixed ginger (Zingiber officinale) and garlic (Allium sativum) juice attenuates hippocampal astrocytic response and other markers of hippocampal function in lead-induced Wistar rats."

Kenneth Oparaji, *Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria*

"The effects of divided attention on long-term memory retrieval"

Nursima Ünver, *Psychology Department, Sabanci University, İstanbul, Türkiye*

Western Hemisphere (excluding US and Canada)

"High-performance athletes in combat sports: understanding the neural bases of aggression"

Eduardo Gonzalez-Alemany, *Department of Cognitive and Social Neurosciences, Center for Neurosciences of Cuba, La Habana, Cuba*

Previous Winners of JoCN Travel Award

2022

Sophie Smit, *Macquarie University, Sydney, Australia*

Prerna Dash, *University of Delhi*

Nursima Ünver, *Sabanci University, İstanbul, Türkiye*

Eduardo Gonzalez-Alemany, *Center for Neurosciences of Cuba, La Habana, Cuba*

Workshops, Socials & Special Events

Title	Date	Time	Location
Satellite Event: Opening the Door to Engagement with the National Science Foundation	Saturday, March 25	10:00 – 11:00 am	Seacliff Room
CNS 30th Anniversary Dance Party	Saturday, March 25	8:00 – 11:00 pm	Grand Ballroom
DEI Workshop - Colors of the Brain: Recommendations for Serving Students from Historically Marginalized Groups in Neuroscience	Sunday, March 26	12:15 – 1:15 pm	Bayview Room
Workshop - Recording What Happened during your experiment using Hierarchical Event Descriptors (HED)	Monday, March 27	12:15 – 1:15 pm	Seacliff Room
Workshop - Industry Professional Development Panel	Monday, March 27	12:15 – 1:15 pm	Bayview Room
8th Annual CNS Trainee Professional Development Panel	Monday, March 27	5:45 - 7:15 pm	Bayview Room
CNS Trainee Association Student Social Night	Monday, March 27	7:30 - 10:00 pm	Monroe's

Satellite Event: Opening the Door to Engagement with the National Science Foundation

Saturday, March 25, 2023, 10:00 - 11:00 am, Seacliff Room

The workshop will include presentations by Jonathan Fritz (Program Director for NSF Cognitive Neuroscience Program), who will also present information from Enrique Pumar (Program Director for NSF Build and Broaden Program). The presentations and discussion will highlight ways to broaden the engagement of diverse communities, including members of non-R1 institutions in NSF research. Specific program opportunities, such as tips for applying to NSF, will be discussed, including ways to partner with NSF-funded researchers at R1 universities to create research and training opportunities.

CNS 30th Anniversary Dance Party

Saturday, March 25, 2023, 8:00 - 11:00 pm, Grand Ballroom

Join us for a fun filled evening as we celebrate the 30th Anniversary Meeting of the Cognitive Neuroscience Society. We will start off the night with a local DJ from 8:00PM - 9:30PM followed by a special appearance from Pavlov's Dogz (Sponsored by JocN) from 9:30PM - 11:00PM

Pavlov's Dogz

DEI Workshop - Colors of the Brain: Recommendations for Serving Students from Historically Marginalized Groups in Neuroscience

Sunday, March 26, 2023, 12:15 - 1:15 pm Bayview Room

Despite major projected shifts in US demographics, the systematic exclusion of peoples from historically marginalized groups in the neuroscience research workforce continues to threaten prospects for scientific innovation and societal impact. Colors of the Brain (CoB), a UC San Diego graduate student organization founded in 2016, has addressed this problem by providing undergraduate students from historically marginalized groups with invested graduate student mentors who have gone through the transition into Ph.D. or M.D./Ph.D research programs. In 2020, CoB began a fully-funded summer research program that has aided in the inclusion and retention of 13 undergraduate students from historically marginalized groups in neuroscience research at UC San Diego and the Salk Institute. Five founding and/or currently active members (all current graduate students or postdocs) will lead a discussion that includes specific recommendations for students on how to launch a similar initiative at their own institution, and for faculty on how to support that endeavor and ensure an equitable, positive, and fruitful research experience for students who may otherwise lack research career mentorship.

Sponsored by UC San Diego SCHOOL OF SOCIAL SCIENCES

Panelists:

- *Christian Cazares: Co-founder*
- *Pam Riviere: Co-founder*
- *Julia Gorman: Program Coordinator*
- *Sana Ali: Mentorship Coordinator*
- *Michael Preston: Graduate Mentor*

Journal of Cognitive Neuroscience

Workshop - Recording What Happened during your experiment using Hierarchical Event Descriptors (HED)

Monday, March 27, 2023, 12:15 - 1:15 pm, Seacliff Room

In this era of rapidly expanding frontiers of data analysis, data archiving and sharing is becoming ever more important as the sustained value of well-archived data for further analysis and mega-analysis continues to increase. However, sharing the recorded data streams alone is not sufficient; to make saved and/or shared data useful, there must be a record of not only how the data were acquired - but as well of what the participant experienced and did during the recording. The only proposed system for recording the nature of events in neuroimaging experiments is the open source system of Hierarchical Event Descriptors (HED), which has now been accepted into all the BIDS modality standards and supported by NIMH. This workshop will help you get started in building HED annotations for your event-related neuroimaging data (EEG, MEG, fMRI, etc.).

Workshop - Industry Professional Development Panel

Monday, March 27, 2023, 12:15 - 1:15 pm, Bayview Room

As cognitive neuroscientists we're trained in diverse domains: from psychology to statistics; from experimental design to programming. This diversity is critical for scientific research and is also highly valued in industry. In this panel, former CNS members will speak about their nonacademic careers, advising on resume, networking, and skills development.

Panelists:

- Avgusta Shestyuk, *Ph.D., Global Head of Science and Research, BASES-Neuro, NielsenIQ*
- Nick Wan, Ph.D., *Director of Baseball Analytics, Cincinnati Reds*
- Anett Gyurak, Ph.D*., Director, Research - Central Science, Strategy, and Research, Meta*

CNS Trainee Professional Development Panel

Monday, March 27, 5:45 – 7:15 pm, Bayview Room

CNSTA Professional Development Panel Organizers: *Alexandra Gaynor (Columbia University) & Casey Imperio (City University of New York)*

Join the CNS Trainee Association (CNSTA) for the 8th annual Professional Development Panel! Hear from some of the foremost experts in the field of cognitive neuroscience as they detail their career trajectories, discuss factors that influenced their development, and reveal what they wish they had known as Trainees. Part of the session time will be reserved for an open Q&A. Appropriate for trainees of all levels!

CNS Trainee Association Student Social Night

Monday, March 27, 7:30 – 10:00 pm, at Monroe's located at *473 Broadway, San Francisco, CA 94133*

This event is open to all students and post docs of the Cognitive Neuroscience Society.

CNSTA Social Organizers: *Alexandra Gaynor (Columbia University) & Casey Imperio (City University of New York)*

Come and join us for the annual CNS Trainee Association (CNSTA) Student Social Night, Monday, March 27th, after the CNS Trainee Professional Development Panel. We will meet at 7:15 PM in the conference hotel reception area (look for signs), and walk out to a nearby bar/restaurant around 7:30. There will be no cover charge and one free drink and appetizers will be provided for the first 150 Trainees (cash bar). We look forward to meeting you!

HOW TO GET THERE:

From the Hyatt:

- Go West on Sacramento St (away from the waterfront)
- Turn Right on Battery St
- Turn Left onto Broadway
- Destination will be on your left at 473 Broadway, San Francisco, CA 94133

CNS at 30: Perspectives on the Roots, Present, and Future of Cognitive Neuroscience

Saturday, March 25, 2023, 1:00 - 3:00pm, Grand Ballroom

Co-Chairs: Patricia Reuter-Lorenz, University of Michigan & George (Ron) Mangun, University of California, Davis

Speakers: Daniel L. Schacter, Marlene Behrmann, Nick Turk-Browne, Adriana Galvan

This symposium commemorates the 30th anniversary of the Cognitive Neuroscience Society by bringing together four speakers to offer their perspectives on the roots, current developments, and future directions of our field. The speakers, each of whom has been recognized for their outstanding scientific contributions by accolades from CNS and from the broader profession, will discuss advances in human brain science made possible by cognitive neuroscience approaches to research on topics including memory, vision, complex pattern recognition, early child development, digital media and adolescent mental health.

TALK 1: ON THE EMERGENCE OF COGNITIVE NEUROSCIENCE: MEMORY RESEARCH AS A CASE STUDY

Daniel L. Schacter, Department of Psychology and Center for Brain Science, Harvard University

One of the key strengths of cognitive neuroscience lies in its incorporation of ideas and methods from multiple complementary approaches, including cognitive psychology, neuropsychology, behavioral neuroscience, and functional neuroimaging. This presentation will examine the emergence of cognitive neuroscience during the past half-century through the lens of memory research, focusing on the development of interactions among cognitive, neuropsychological, and neuroscientific approaches during the 1980s that set the stage for the explosive growth of functional neuroimaging studies of memory beginning in the 1990s. The formation of the Cognitive Neuroscience Society in 1993 was well-timed to crystallize and promote the further development of cognitive neuroscience approaches to memory that have continued to shape the field for the past 30 years.

TALK 2: AT LEAST A HUNDRED YEARS OF HEMISPHERIC LATERALIZATION STUDIES AND STILL GOING STRONG

Marlene Behrmann, Department of Ophthalmology, University of Pittsburgh School of Medicine

In February 2023, a Pubmed search with the term 'hemispheric specialization' yielded 21,748 papers, all of which seek to identify and understand which particular functions are the purview of the right versus left hemisphere. Cognitive neuroscience as a discipline continues to pursue answers to this question. In this talk, I will describe the ongoing contribution of cognitive neuroscience approaches to advancing our understanding of cortical organization. I will take as my focus the neural mechanisms that subserve complex visual pattern recognition, and will draw on evidence from studies of the visual system in health and disease (normal adults and children, individuals with focal neuropsychological deficits, and individuals with hemispherectomy or lobectomy) adopting multiple methodologies (psychophysics, neuroimaging, stereoencephalography). I will propose that visual recognition emerges from the interactive engagement of a network of regions, which is distributed within and across both hemispheres, and which evince graded functional specialization. Data will be used to test predictions such as specific collaborative and competitive synergies of hemispheric bias that play out over the course of development, the nature of representations across the two hemispheres and the extent to which a single hemisphere, either left or right, might suffice for recognition. Last, I will lay out open questions which will, undoubtedly, occupy the field well into the future.

TALK 3: CHILDREN ARE THE FUTURE: THE (RE)BIRTH OF INFANT COGNITIVE NEUROSCIENCE

Nick Turk-Browne, Yale University

Until 2020, there were three fMRI studies in awake infants performing cognitive tasks. This stood in contrast to thousands of task-based fMRI studies in adults and older children over the preceding three decades. It was not for a lack of need or interest, as the field of infant cognition has long struggled (and still achieved great success) with overdetermined behavioral measures such as looking time. Neuroscientific methods have the potential to delineate multiple drivers of these simple behaviors and to record cognition incidentally with high-throughput, dynamic measures. Scalp EEG and fNIRS have made important contributions in this direction, but fMRI holds distinct advantages, including whole-brain coverage with access to deep-brain structures, spatial precision for revealing neural tuning and representations, and the possibility of building on notable advances in fMRI design, acquisition, and analysis from adult studies. In this talk, I will present the approach my lab has developed for awake infant fMRI and share some of our recent progress, including on retinotopic mapping, face perception, attentional cuing, statistical learning, and event segmentation. I will also highlight some of the big open questions that awake infant fMRI could address in principle, such as why infants are such proficient learners, why we all have amnesia for infant experiences, and how infants perceive and think about their environment. Despite countless limitations and challenges at present, this work suggests that awake infant fMRI could become feasible, useful, and ubiquitous in cognitive neuroscience.

TALK 4: THE PROMISE OF DEVELOPMENTAL COGNITIVE NEUROSCIENCE

Adriana Galvan, University of California, Los Angeles

From infancy, to middle childhood and through adolescence, dynamic changes in the brain interact with a changing social landscape to influence developmental processes. In recent years methodological advances in cognitive neuroscience have provided tools to examine the developing brain. What the field has learned is that bidirectional interactions between brain and environment have a significant impact on trajectories and outcomes. Importantly, these scientific insights have shed light on behaviors and conditions that are particularly unique to the developing child and adolescent, including mental health and digital media use. Collectively this developmental cognitive neuroscience research has also had an increasingly important role in informing policies and practices that impact young people.

Session #	Date	Time	Location	Chair
Data Blitz Session 1	Saturday, March 25	11:00 am – 12:30 pm	Grand Ballroom A	Vishnu Murty
Data Blitz Session 2	Saturday, March 25	11:00 am – 12:30 pm	Grand Ballroom B/C	Elizabetta Ambron
Data Blitz Session 3	Saturday, March 25	11:00 am – 12:30 pm	Bayview Room	Simon Davis

Data Blitz Sessions

A Data Blitz is a series of 5-minute talks, each covering just a bite-sized bit of research. It will offer a fast-paced overview of some of the most exciting research presented at this year's poster sessions.

Data Blitz Session 1

Saturday, March 25, 11:00 am - 12:30 pm, Grand Ballroom A
Chair: Vishnu Murty, Temple University
Speakers: Carola Salvi, Abigail Hsiung, Benjamin Rangel, Noah Reardon, Yuxi Candice Wang, Miriam Taza, Sneha Sheth, Gaelle Doucet, Hai-Tao Wu, Jennifer Crawford, Jacob Miller, Jonathan Daume, Gayathri Satheesh, Thomas Biba, Damiano Grignolio

TALK 1: AHA! EXPERIENCES ENHANCE LEARNING FOR INCIDENTAL INFORMATION. NEW EVIDENCE SUPPORTING THE INSIGHT MEMORY ADVANTAGE.

Carola Salvi, University of Texas at Austin - John Cabot University of Ro

Research on creative problem solving finds that solutions achieved via spontaneous insight (i.e., Aha! moment) are better remembered than solutions reached without a sense of epiphany, referred to as an 'insight memory advantage.' We hypothesized that the insight memory advantage can spread to incidental information encoded in the moments surrounding spontaneous insight as well. Participants (N= 291) were presented with incidental scholastic facts, unrelated to the problem, immediately after indicating they reached a solution to a word problem (i.e., Rebus Puzzles), but prior to entering the answer. Participants indicated whether they reached the solution via either insight or a step-by-step analysis. Memory results showed better performance for incidental scholastic facts presented when problem solving was accompanied by a spontaneous insight (Aha!) compared to solutions reached without an Aha! moment. This finding suggests that the memory advantage for problems solved via insight spreads to other unrelated information encoded close in time. These findings have implications for enhancing learning and memory retention by incorporating unrelated information in temporal proximity to insight-based problem solving.

TALK 2: SPOILER ALERT! CURIOSITY PRIORITIZES THE INFORMATION GATHERING PROCESS OVER THE OUTCOME

Abigail Hsiungi, Duke University

Curiosity, the desire to know, is a fundamental motivator of human behavior. Current theoretical accounts posit that curiosity directs information seeking choices towards the resolution of uncertainty. Yet in everyday life, we often prolong uncertainty, for example avoiding spoilers for just-released movies. We investigated whether states of high curiosity favor delaying resolution to experience an event as it unfolds. We developed a novel video task in which line drawings slowly resolved into objects. As each video progressed, participants made choices about how long to keep watching. Across two studies that varied in the amount of agency allotted to participants, we showed that when curious, participants often choose to remain uncertain as information is gradually revealed, rather than alleviate uncertainty immediately (i.e., viewing a spoiler). Across studies, we found that allowing participants to titrate their information sampling experience emphasized the importance of self-determined resolution. The ability to precisely control timing increased the likelihood of stopping a video early but only when participants correctly reported the identity of the drawing. The choice to prolong uncertainty also benefitted the information gathering experience, promoting enhanced feelings of satisfaction, and improving memory for the drawing in the video. Our findings reveal that curiosity not only confers value to information itself, but also influences preferences for how one arrives at that information, highlighting the reward value inherent in the process of discovery as an important factor for curiosity and memory formation.

TALK 3: SURPRISE-INDUCED INHIBITION OF ACTIVE TASK SET REPRESENTATIONS

Benjamin Rangel, University of Iowa

Simple tasks, such as opening your front door, involve multiple neural representations - the external situation (your house/door), the associated actions (insert/twist key & twist knob), and the expected outcome (door opens). These lower representations are purportedly combined into higher-order, conjunctive representations (opening your front door), which are stored and retrieved at later times to facilitate repeated behaviors. Previous research has demonstrated that such conjunctive representations are also retrieved when the situation or context is similar but not identical, resulting in the preparation or

execution of inappropriate actions - and hence a 'partial-repetition cost' (PRC, e.g., reaching for your key at your friend's front door; Rangel et al., JNeuro 2022). Here, we used the PRC to test whether surprising, task-unrelated events, prior to the response, can inhibit the formation or later retrieval of conjunctive representations. Surprising events are known to inhibit active working memory contents (Wessel et al., Nature Communications 2016), and we hypothesized that this may include task sets. Forty-five adult humans performed a task-switching paradigm while undergoing EEG recordings, which we used to decode neural signals indexing conjunctive task set representations (Kikumoto & Mayr, PNAS 2020). In line with prior work, the partial repetition of task set features between two spaced trials lead to a deficit on reaction time. However, this PRC was completely abolished when a surprising event occurred after the formation of the initial task set's conjunctive representation. This suggests that surprising events can inhibit the strength of active task sets, and consequently their retrieval.

TALK 4: INCIDENTAL EXPOSURE OPTIMIZES ATTENTION TO FEATURES THAT ARE RELEVANT TO CATEGORY MEMBERSHIP

Noah Reardon, The Ohio State University

Categories simplify and help us interact with our environment. Most research on category learning has explicitly taught categories and found that adults selectively attend to the smallest number of features that determine category membership. However, much exposure to real-world categories occurs incidentally, without an explicit intention to learn. Moreover, categories are typically associated with clusters of features that occur together; for example, trees tend to have a trunk, branches, and leaves. Recent evidence suggests that incidental exposure improves subsequent category learning from explicit teaching. One explanation for this may be that attention is drawn to features that cluster together and are thus relevant to category membership. To test whether incidental exposure optimizes attention to relevant features, we tasked participants with learning to categorize unfamiliar creatures. Category membership depended on the appearance of a cluster of 'relevant' features. Critically, before this task, participants were exposed to the creatures during a simple game in either an Incidental condition, in which they saw creatures belonging to two categories, or a Baseline condition, in which they saw randomized creatures. Eye tracking was used to examine attention to irrelevant versus relevant features. Results suggest that participants in the Incidental condition began attending to relevant features during the exposure phase. Moreover, those who continued paying attention to these features excelled at category learning. In contrast, Baseline participants gradually refocused their attention to relevant features after being explicitly taught categories. This study provides evidence that incidental exposure optimizes attention to features that are relevant to category membership.

TALK 5: TARGET DETECTION DOES NOT INFLUENCE TEMPORAL MEMORY

Yuxi Candice Wang, Duke University

Target detection has been found to enhance subsequent memory for concurrently presented stimuli under dual-task conditions. This phenomenon, the 'Attentional Boost Effect,' has been generalized across a variety of memory tests, including item recognition memory, source memory, and memory for task-irrelevant stimulus features. One interpretation is that the detection of a target constitutes an event boundary that enhances perceptual processing of concurrently presented information, analogous to the source memory enhancement effect for boundary items. In support of this idea, prior research has found locus coeruleus activity-related phasic pupil response to be associated with both target detection and event segmentation. Like event boundaries that require an update of working memory event representations or an update of task goals, responding to a target (either an overt response like a button press or a covert response like increasing a mental count) also requires working memory update. Though there are important parallels between the Attentional Boost Effect in target detection and event segmentation studies, whether target detection also impacts temporal memory in similar ways as event boundaries remains unknown. We investigated this question in a pre-registered experiment with sequential Bayes factor design by inserting targets and distractors during encoding of trial-unique object images, then comparing subsequent temporal order and distance memory for image pairs that span a target or distractor. We found that target detection enhanced recognition memory for target-concurrent images but had no effect on temporal memory. These results suggest that target detection does not disrupt inter-item associations in memory like event segmentation.

TALK 6: AGE-RELATED DIFFERENCES IN THE RELATIONSHIP BETWEEN THE BASAL FOREBRAIN VOLUME, FUNCTIONAL CONNECTIVITY, AND COGNITION

Miriam Taza, McGill University

The basal forebrain (BF) comprises large cholinergic projection neurons that innervate the entire cortical mantle. Acetylcholine is involved in low-frequency sleep-wake cycles of alertness, in addition to a rapid modulation of cortical processes involved in attention. The cholinergic BF is impacted early in the progression of Alzheimer's disease. However, age-related differences in the relationships between BF structure, functional connectivity, and attention are poorly understood. Neuropsychological assessment of cognition, anatomical and resting-state multi-echo functional MRI were analyzed in a sample of 145 younger (mean age=22y, SD=3y) and 75 older (mean age=68y, SD=6y), cognitively intact, healthy adults. In older adults, BF volume was smaller than younger adults ($p<.01$) and was related to a measure of executive attention (self-ordered search), where larger BF volume

was associated with faster reaction time (r =-.24, p<.01) and higher task accuracy (r =.23, p<.05), after accounting for sex, age, education, and intracranial volume. No associations were observed for episodic memory, vocabulary or processing speed (p's>.20). Age-group differences were also observed in a multivariate partial least squares analysis comparing BF connectivity with known cortico-cortical resting state networks (p<.001). In young adults, the magnitude of BF connectivity was higher in regions of the limbic, salience, and somatomotor networks. In contrast, older adults showed greater BF connectivity to regions of the default network. These results provide novel evidence that functional connectivity between the BF and neocortex changes with advancing age, and that these functional changes are related to BF structural integrity and executive attention.

TALK 7: EXPERIENCE SAMPLING DURING FMRI REVEALS DISTINCT DYNAMICS IN THE STREAM OF THOUGHT

Sneha Sheth, University of British Columbia

One of the most striking features of human consciousness is its ability to foster an ongoing and seemingly continuous stream of thought. How do mental states unfold over time as the mind moves from one thought to another? The Dynamics of Thought framework has suggested a taxonomy of thought based entirely on the way it moves over time (i.e. strength and type of constraints applied on thought) rather than features of its content (e.g., task-relatedness). We empirically tested two kinds of dynamics proposed in this framework: deliberately constrained and relatively unconstrained (i.e. spontaneous) thought. Our study attempted to characterize the brain regions and networks involved in these phenomenally distinct transitions between mental states. In our experience sampling paradigm, participants were asked to let their thoughts unfold naturally as they were intermittently probed to rate their thoughts on the degree of free-movement and active-direction while in an fMRI scanner. Results show that regions of the medial-temporal subcomponent of the default-mode network, specifically, the hippocampus and parahippocampus, were more engaged during relatively unconstrained thought. Regions of the Fronto-Parietal Control Network were more associated with constrained thought. Our findings suggest that executive regions are more associated with strong constraints on the stream of thought whereas default network regions, specifically the medial temporal subcomponent, are more active when constraints on the stream of thought are relatively weak. Our study also validates the effectiveness of a combined approach of experience sampling and fMRI in the context of subtle thought dynamics.

TALK 8: HEALTHY AGING IMPACTS THE CONSTRUCTION BUT NOT THE ELABORATION OF SOCIAL PROSPECTIVE THOUGHTS

Gaelle Doucet, Boys Town National Research Hospital

The default-mode network (DMN) supports imagining episodic future scenarios and its regional constitution changes over the lifespan. The aim of this study was to investigate the DMN during the generation of social prospective thoughts using functional MRI (fMRI) from adolescence to late adulthood. Further, we tested whether different life stages (i.e., adolescence, early adulthood, late adulthood) were associated with differences in the DMN activation while constructing and elaborating prospective thoughts. To do so, we recruited a total of 146 healthy participants (27 adolescents: mean(sd) age=14.86(2.07) years, 14 males; 79 young adults: age=24.26(3.44) years, 33 males; 40 older adults: age=62.20(6.31) years, 16 males). The social prospection fMRI task consisted of two runs composed of 27 pseudo-random scenarios, each. Scenarios shown were positive or negative social events, or a control (non-social) scenario to imagine. Participants were instructed to press a button immediately after constructing the scenario and elaborate for the remaining time (total: 11sec). There was no significant difference in reaction times to construct events between groups. As expected, the fMRI results showed activation in the DMN during social scenarios, compared to control scenarios, across all participants. However, older adults showed an overall reduction of activation in the whole DMN while constructing social scenarios relative to young adults. No other age differences were revealed, including during the elaboration phase. The present findings provide evidence that healthy aging impacts social future thinking, particularly the construction phase, and may help identify biological factors that influence the generation of social prospective thoughts.

TALK 9: HUMAN BRAIN CONSTRUCTS COGNITIVE MAPS ADAPTIVELY BY RE-SCALING ABSTRACT CONCEPTS

Hai-Tao Wu, Peking University

It has been proposed that the brain organizes concepts as different axes into multidimensional spaces where items are embedded. Gridlike patterns associated with concept representation have been observed in the human medial prefrontal cortex (mPFC) and entorhinal cortex, suggesting a spatial coordinate system similar to those coding psychical environments. However, different from mapping physical spaces, whose metrics are naturally consistent between dimensions, constructing multidimensional concept spaces involves determining the metric relationship between distinct, sometimes incomparable, concepts. For example, when a cognitive map constitutes fruit diameters and tartness as two dimensions, which scales should be used for representing these disparate concepts, respectively? Here, we propose that the brain represents conceptual cognitive map with adaptive scales, adjusting for the statistical distribution of item features

in the environment and maximizing representation precision with limited coding capacity. To test this hypothesis, we created two 2D conceptual spaces with different measurement ranges of item features. Two groups of subjects were trained to learn one of two conceptual spaces. Using fMRI, we show that the mPFC in both groups demonstrated the well-established effect of 6-fold modulation when subjects mentally navigate in different directions as defined by the hypothesized adaptive scales. Importantly, comparing with a range of alternative representational scales, the effect was most prominent when tested using the putative adaptive scales. These results point to an organization principle for flexible, context-dependent construction of abstract cognitive maps.

TALK 10: NEURAL MECHANISMS OF COGNITIVE EFFORT-BASED DECISION-MAKING: A MULTIMETHOD APPROACH

Jennifer Crawford, Washington University

Many daily-life activities require cognitive effort, yet individuals differ in their willingness to engage in those that are cognitively effortful. Individual differences in the subjective value (SV) associated with cognitive effort have been linked to both striatal dopamine D2 receptors (D2R) and to cortical regions supporting cognitive control (e.g., dorsal anterior cingulate cortex; dACC). To date, however, no studies have acquired within-person data on both dopamine-receptor density and brain activity dynamics during cognitive effort decision-making, nor linked these types of data to effort-based decision-making in daily life contexts. Here, we employed simultaneous PET-fMRI scanning, combined with ecological momentary assessment (EMA), to examine whether individual differences in brain activity and D2R density related to cognitive effort decision-making in both neuroeconomic task performance and daily life activities. Brain activity was monitored with fMRI while participants (N=26) completed the Cognitive Effort Discounting paradigm (Cog-ED) across two distinct cognitive domains (working memory, speech comprehension), while D2R binding was measured with the high-affinity, high-specificity PET radioligand [11-C]NMB. Participants also completed a 7-day EMA measuring the mental demands of daily activities. Across both domains, dACC activity tracked the relative SV of high vs. low-effort options, and participants' behavioral (choice) sensitivity to this relationship. Furthermore, individual differences in caudate D2R density were related to both fMRI activity modulation (reflecting the encoding of cognitive effort SV) and to daily-life engagement in mentally demanding activities. Together, these findings highlight the utility of multimethod experimental approaches to understand individual differences in complex behaviors such as decision-making based on cognitive effort.

TALK 11: SPATIAL SCALES OF CODING FOR WORKING MEMORY IN PRIMATE LATERAL PREFRONTAL CORTEX

Jacob Miller, Yale University

The prefrontal cortex (PFC) is consistently active during working memory (WM). While non-human primate (NHP) electrophysiology finds that PFC maintains WM representations, these item-related PFC signals are harder to detect with human neuroimaging. This discrepancy may result from spatial intermixing of neurons in PFC with different functional tuning. However, uncovering the functional microcircuitry for WM is difficult without detailed spatial organization about neuronal populations. Here, we leveraged a novel, two-photon calcium imaging dataset in NHPs (Xie et al., Science, 2022) to investigate the functional organization of WM circuits. In a multi-item delayed saccade task, 2 or 3 spatial locations were sequentially presented and subjects had to reproduce the target locations, in order, after a WM delay period. During task sessions, calcium traces were recorded from 20 fields-of-view (500x500um) in area 9/46 of lateral PFC (~3,600 total cells). We then analyzed the relationship between WM coding and microscale organization. Neurons with the strongest conjunctive/abstract coding - whose spatial tuning changed based on the sequence position in WM - were clustered tightly together at a 100um scale. This single-neuron organization also influenced population decoding measures: neural activity spatially averaged at finer scales (25um) showed stronger WM item representations at position 1 in sequences, but this spatial scale degraded at positions 2 and 3 with increased WM load. Overall, there is a fine microscale organization of abstract WM coding in PFC likely inaccessible to voxel-level sampling, helping to reconcile discrepancies between human neuroimaging and NHP electrophysiology perspectives of WM coding in PFC.

TALK 12: A SINGLE CELL CORRELATE OF THETA-GAMMA PHASE AMPLITUDE COUPLING DURING WORKING MEMORY IN THE HUMAN HIPPOCAMPUS

Jonathan Daume, Cedars-Sinai Medical Center

Phase amplitude coupling (PAC) is thought to be crucially involved in interactions between cognitive control and stimulus processing during working memory (WM) maintenance. However, it remains unknown how PAC relates to spiking activity of single cells. Here, we recorded single cells and local field potentials from the human brain while patients performed a WM task (44 sessions, 36 patients, 1518 neurons). We observed strong theta-gamma PAC in the medial temporal lobe during the WM delay period. Only in the hippocampus, however, PAC differed as a function of load with stronger PAC observed in load 1 as compared to load 3. Weak to no PAC was observed in the medial frontal lobe. We identified neurons in the hippocampus whose firing rate specifically followed local theta-gamma PAC during the WM delay period. These PAC cells differed from category cells whose firing rate was indicative of stimulus identity and

showed stronger spike-field coherence to gamma when their preferred category was held in mind. PAC cells, on the other hand, showed stronger phase coupling to frontal theta oscillations with higher WM loads, indicating their involvement in cognitive control rather than stimulus maintenance. Structured noise correlations between PAC and category cells moreover allowed for efficient representations of stimulus identity in the hippocampus. Our results provide in-depth insights into the single cell correlates of interactions between frontal cognitive control as well as posterior sensory processing and suggest a functional role of PAC cells in enhancing the ability of briefly maintaining sensory information in mind.

TALK 13: WORKING MEMORY IS COMPOSED OF DISTINCT SUBCOMPONENTS

Gayathri Satheesh, New York University Abu Dhabi

Is working memory (WM) a unitary construct, or is it composed of distinct functions? In line with this latter view, focal lesions typically do not result in an overall loss of WM function but instead elicit unique patterns of nuanced behavioral deficits. To directly address this question, we designed a novel visual WM battery to selectively engage putative WM subcomponents: storage, selection, resistance, updating, and manipulation. On each trial, participants maintained the colors and locations of multiple discs over a brief memory delay and reported the location of the cued disc. We varied demands on individual subcomponents across trials by varying the number of discs to remember, the presence of irrelevant information during encoding or maintenance, or requiring subjects to reformat or manipulate memory contents. To test the independence of putative WM subcomponents, we conducted an online behavioral study where 200 participants were tested at two timepoints, T1 and T2, approximately 10 days apart. Individual subcomponent scores were calculated from subjects' behavioral error. The correlation between scores at T1 and T2 was significantly greater within- relative to between-subcomponents, arguing against a unitary WM construct. Instead, our data was best described by a model that included at least four subcomponents. In a second experiment, we collected fMRI data as subjects performed the WM battery. Representational similarity analysis revealed separable BOLD activation patterns for different subcomponents across frontal and parietal regions of interest. Taken together, these findings suggest that WM involves selective engagement of multiple subcomponents with distinct patterns of neural activation.

TALK 14: RHYTHMIC OSCILLATIONS BETWEEN TASK SETS DELINEATE STABLE VERSUS FLEXIBLE COGNITIVE CONTROL

Thomas Biba, University of Toronto

The ability to multitask underpins cognitive control, yet how we flexibly switch between task sets remains unknown. One challenge is characterizing how cognitive stability, the propensity to efficiently perform a task amidst distraction, trades off with cognitive flexibility. Attention research provides a clue; people rhythmically alternate between sampling cued and un-cued spatial locations in phase with theta oscillations in frontoparietal networks. Here we adapted the behavioral oscillation approach to assess if people likewise rhythmically prepare for different tasks. In our task switching paradigm, participants perform one of two object classification judgments (size or indoor/outdoor) depending on the color of the preceding cue, meant to reset putative neural oscillations. Critically, we systematically varied the cue-to-object stimulus onset asynchrony (SOA; 200-1100ms; 28 increments of 33ms) to reconstruct a time-course of how classification performance varied during the milliseconds following the cue (N=120). Analyses revealed theta oscillations in reaction time on both tasks (in/out: 5-8Hz, $p<0.05$; size: 5-6Hz, $p<0.001$). Remarkably, theta phases were roughly 180 degrees offset between the two tasks (Mc=-174.8, rho=0.25, $p<0.001$), as though people alternated between preparing for each task several times per second. Furthermore, the degree of phase offset between task rhythms had telling links to performance: participants with a greater phase difference between tasks (i.e. approaching 180 degrees) were faster at classifying objects in general ($R2=0.06$, $p<0.001$), but showed larger switch costs ($R2=0.17$, $p<0.001$). Our results suggest that trade-offs between cognitive stability and flexibility are respectively enabled by greater or lesser differentiation of task sets across hundreds of milliseconds.

TALK 15: ALPHA DESYNCHRONIZATION TRACKS THE SPREAD OF ATTENTION ACROSS VISUAL OBJECTS

Damiano Grignolio, University of Birmingham

Attention is sensitive to the boundaries of visual objects, such that selection of one part of a stimulus leads to the prioritization of other parts of that same object. This has been interpreted as reflecting a low-level perceptual mechanism supporting segmentation, which engenders the automatic 'spreading' of attention within objects. We used human electrophysiology to test these ideas during preparatory attention. In our paradigm, participants were auditorily cued to attend to one of 4 spatial positions located at the ends of two rectangles. Prior work has demonstrated that participants are faster to respond to a target that subsequently appears at the cued location, but that there is also a benefit when the target appears at any other location on the cued object. In our task, the rectangles were either oriented vertically, such that they were each presented in one hemifield, or horizontally, such that each subtended the vertical meridian of the display. We collected EEG data and quantified oscillatory alpha (8-12 Hz) power. We observed the well-known effect that alpha contralateral to the cued location decreased in amplitude, reflecting the deployment of attention to the cued visual hemifield. Critically, this effect was reduced when the rectangles were oriented horizontally versus vertically. We interpret this as evidence that attention-related alpha lateralization is reduced when attention spreads across objects in one visual hemifield, versus when attention spreads across visual hemifields. These results

are consistent with the idea that object attention involves changes in the allocation of preparatory visual spatial attention.

Data Blitz Session 2

Saturday, March 25, 11:00 am - 12:30 pm, Grand Ballroom B/C
Chair: Elizabetta Ambron, University of Pennsylvania
Speakers: Elizabeth Toomarian, Anna Borne, Megan Hillis, Sophie Jano, Carly Leannah, Maya Yablonski, Holly Zaharchuk, Joseph Salvo, Maggie Baird, Lukasz Bola, Danlei Chen, Alexis Kidder, Athena Willis, Yuan Tao

TALK 1: TWO WEEKS OF CLASSROOM-BASED TRAINING CHANGES NEURAL RESPONSES FOR LEXICAL ACCESS: INSIGHTS INTO NATURALISTIC EDUCATION BY BRINGING SSVEP AND EEG INTO SCHOOLS

Elizabeth Toomarian, Stanford University, Synapse School

Segregating the lexical processes underpinning word recognition, especially in early readers, has been challenging in previous literature employing Steady-State Visual Evoked Potential (SSVEP) paradigms. Recently, our group (Wang et al. 2022) found robust lexical responses in early readers by slowing down SSVEP presentation rates, and using high frequency words. The current study extends this approach to measure whether short-term training would affect the circuits of lexical access beyond low-level visual processing. Three lists of five-letter low frequency (<1 per million) words were prepared, with 20 items for each list. Unigram, bigram, trigram frequencies, number of phonemes and syllables, and orthographic structures were well matched across these three-word lists. These lists were semi-randomly assigned across three classes of early readers ranging from age 6-8 years. After training on the assigned word list, EEG data were recorded while participants (n=28) were presented with trained (from their own class) and untrained (from other classes) five-letter words, at 1/3Hz (i.e., one trained and two untrained words per second) frequencies. Contrasts of high frequency words (> 500/million) vs. pseudowords and medium frequency words (100~500/million) vs. pseudowords were also used to test whether the training effect of low frequency words reached the level of lexical processing. Trained five-letter words evoked neural activations over the occipito-temporal region, similar to the activation area evoked by high frequency words. This finding suggests that neural markers for word lexical access develop rapidly after a short term of formal training in school.

TALK 2: EVALUATION OF INTER-COGNITIVE INTERACTION IN HEALTHY SUBJECTS AND PERSPECTIVES IN RASMUSSEN ENCEPHALITIS AFTER HEMISPHEROTOMY: A BEHAVIORAL NETWORK APPROACH

Anna Borne, Univ. Grenoble Alpes, CNRS, LPNC

Traditionally, cognitive functions (i.e., language, memory, executive functions, social cognition) are considered distinct in terms of involved mechanisms and brain representations. However, current research tends to consider cognitive domains as intertwined, working in interaction in larger neurocognitive networks. In the present study, we aim to characterize such inter-cognitive functioning via behavioral measures for different cognitive domains, adopting a network perspective based on graph theory (GT). For this purpose, 165 healthy young adults (97 female) completed a battery of behavioral tasks (LEXTOMM; Language, Executive Functions, Theory of Mind, Memory). A cross-correlation matrix between each task performance (%CR, RT ms) was computed to assess inter-cognitive influences. Network analyses were then proposed to investigate this cognitive landscape from an integrative perspective. Correlations between tasks emphasize the interplay between language, memory, and executive abilities in healthy functioning. Furthermore, GT metrics highlighted a structured cognitive network (global efficiency = 0.13; clustering coefficient = 0.06), with the semantics being the major hub, followed by syntax, memory, and inhibition. As a preliminary work, we also applied GT analyses to a clinical population including 12 adult patients who underwent hemispherotomy in childhood to treat Rasmussen's encephalitis. Results suggest a less structured cognitive network (global efficiency = 0.16; clustering coefficient = 0.14) with hub displacement in patients (i.e., flexibility, semantic, phonology, and visuo-perceptive tasks revealing as major hubs) suggesting significant cognitive restructuration associated with brain reorganization. Focusing both on healthy subjects and on clinical populations, GT approaches offer interesting perspectives for the comprehension of cognitive network organization and reorganization.

TALK 3: DECODING KNOWLEDGE OF NEWLY-LEARNED LANGUAGE FROM NEURAL REPRESENTATIONS OF SEMANTIC MEANING

Megan Hillis, Dartmouth College

How is learning new information reflected in the brain? The acquisition of knowledge over the course of learning is often measured through behavioral tests, (e.g., pencil-and-paper tests), however, prior work has demonstrated that data-driven neuroimaging methods can pick up on meaningful changes in neural representations that reflect learning in a number of conceptual domains, including physics and engineering, computer science, and foreign language. Across two studies, we examine the use of these methods for decoding newly-learned information in this case focusing on hearing English speakers learning American Sign Language (ASL). In the first study, novice

participants underwent very brief training (three 30-minute lessons) to learn a set of nouns in ASL, then completed a semantic task during fMRI scanning where the stimuli were presented in the newly-learned language (ASL), a well-known language (English), and an unstudied language (Russian). Using multivariate pattern analysis methods including representational similarity analysis (RSA) and decoding techniques, we found evidence at the group level of neural patterns related to semantic categorization when stimuli were presented in ASL and English, but not in the unstudied language (Russian). Then, in a follow-up study, we investigate the ability of data-driven neural scores derived from a similar analysis to predict behavioral scores at the individual level. Our results provide evidence for the ability of multivariate neuroimaging analysis approaches to detect shifts in understanding even in the earliest stages of language learning.

TALK 4: EXPECTING THE UNEXPECTED: A REANALYSIS OF A MULTI-LABORATORY STUDY WITH AN INVESTIGATION OF PRIOR WORD SURPRISAL

Sophie Jano, University of South Australia

Recent accounts suggest that the perceptual processing of language is facilitated by the prediction of upcoming information. However, how predictions are represented in the brain, and the extent to which prediction underlies linguistic processing, is unclear. The present study sought to examine the neural activity relating to prediction during sentence comprehension, via a reanalysis of Nieuwland and colleagues' (2018) replication of DeLong et al. (2005). Participants (n = 356) were presented with article/noun sentence continuations that varied according to word predictability whilst their electroencephalogram (EEG) was recorded. The present reanalysis measured frontal event-related potentials preceding the critical words, post-word N400 patterns, and inter-individual differences in intrinsic neural activity. Lexical surprisal was calculated as a measure of word predictability using Generative Pre-trained Transformer-2 (GPT-2). Linear mixed-effects regressions revealed larger N400 amplitudes to surprising nouns for those with low individual alpha frequencies (IAFs), suggesting that such individuals may be more inclined to update their predictive models as compared to high IAF individuals. Exploratory analyses supported DeLong et al.'s (2005) findings, revealing greater N400 amplitudes to articles with high versus low surprisal. This relationship was weakened when the surprisal of the two prior words increased, suggesting that repeated exposure to surprising information may prompt the brain to 'expect the unexpected.' These findings have important implications for existing neurocognitive models of language, by suggesting that prediction should not be studied in isolation. Rather, individual neural factors and the accumulation of predictability over time should be accounted for.

TALK 5: DEAFNESS AND ASL FLUENCY EACH DIFFERENTIALLY IMPACT BIOLOGICAL MOTION PERCEPTION

Carly Leannah, Gallaudet University

Some evidence suggests that native American Sign Language (ASL) users show faster and less effortful biological motion perception than hearing non-signers. This finding may be due to deaf signers' expertise in extracting relevant information from complex human movements. However, we do not yet understand if this advantage is due to signed language experience or the experience of being deaf. We created point-light display (PLD) motion stimuli and designed three tasks. The Random Dot Motion task presents random moving dots, and the participants judge whether more dots are moving left or right. Person Perception shows biological human PLDs and scrambled PLDs, and participants determine if a person is present. Action Identification shows biological human PLDs, both right-side-up and inverted, and asks participants to determine whether the action involves using a ball. We gathered accuracy and reaction time from 230 respondents with varying ASL fluencies (non-signers to fluent signers) and hearing statuses (n = 80 Deaf; 21 Hard-of-hearing; 130 Hearing). Participants performed the three tasks during an online experiment. We analyzed data using bivariate analyses and linear mixed models. We found that Deaf respondents performed significantly more accurately than the other groups on the Action Identification task. We also found that while holding Hearing Status constant, higher ASL Fluency led to a faster and more accurate performance on Action Identification. We found other significant effects of Hearing Status, Age, Age of ASL Acquisition, and ASL Fluency which will be discussed further. These data demonstrate the combinatorial effects of sign language use and deafness.

TALK 6: SUBREGIONS OF THE VISUAL WORD FORM AREA SHOW DISTINCT PATTERNS OF FUNCTIONAL CONNECTIVITY

Maya Yablonski, Stanford University

The visual word form area (VWFA) is a region of left ventral occipitotemporal cortex (VOTC) which selectively responds to text. Recent findings suggest that the VWFA comprises at least two distinct subregions: the more posterior VWFA-1 is sensitive to visual features, while the more anterior VWFA-2 processes higher level language information. Complementary evidence suggests that these subregions also differ in their structural white matter connections. Here, we explore whether these two subregions exhibit different patterns of functional connectivity, and whether these patterns have relevance for reading development. We address these questions using two complementary datasets: Using the Natural Scenes Datasets (NSD; Allen et al, 2022) we identify word-selective responses in high-quality adult data, and investigate functional connectivity patterns of VWFA-1 and VWFA-2 defined at the individual level. We then turn to the Healthy Brain Network (HBN; Alexander et al., 2017) database to

assess whether these patterns replicate in a large developmental sample (N=224, age range 5-21y), and to what extent they relate to reading development. In both datasets, we find that VWFA-1 is strongly correlated with bilateral visual regions including VOTC and posterior parietal cortex. In contrast, VWFA-2 is functionally connected to language regions in the frontal and lateral parietal lobes, particularly bilateral inferior frontal gyrus (IFG). Further, the connectivity strength between VWFA-1 and frontal language regions increases with age, while no correlations were observed with reading ability. Together our findings support the distinction between subregions of the VWFA, showing that adjacent regions are coupled with distinct brain networks.

TALK 7: TRACKING THE TIME-COURSE OF CROSS-DIALECT COMPREHENSION WITH ERPS: COMPARING SOUTHERN AND MAINSTREAM US-ACCENTED SPEECH PERCEPTION

Holly Zaharchuk, The Pennsylvania State University

Listeners use social context to adapt to variation in speech. Despite this adaptability in speech perception, research with mono-dialectal speakers of Mainstream US English (MUSE) has demonstrated a consistent advantage for within-dialect (D1-D1) communication over cross-dialect (D1-D2) communication in terms of accuracy, speed, and cognitive effort. However, since bi-dialectal speakers with substantial exposure to more than one dialect are understudied. it is unclear whether the within-dialect advantage is due to production experience, comprehension experience, perceptions of prestige, or a combination of these factors. To investigate the mechanisms that underlie bi-dialectal speech perception, we are conducting a series of auditory EEG/ERP experiments with mono-dialectal MUSE participants and bi-dialectal Southern US English (SUSE) participants that differ in the predictability of the upcoming accent. In the first experiment presented here, we established an unpredictable dialect context by presenting auditory stimuli in MUSE and SUSE accents in random order. Mono-dialectal MUSE participants performed a cover task while they listened to real words and pseudowords in both accents. Results indicate that phonetic and lexico-semantic access are disrupted in D1-D2 communication. Between 150-300ms, MUSE real words elicited larger P200 effects than SUSE real words, reflecting less effortful phonetic access for the D1 accent. Between 300-500ms, SUSE tokens elicited stronger N400 effects than MUSE tokens, reflecting more effortful lexico-semantic access for the D2 accent, regardless of word type. These findings contribute to the linguistic diversification of traditional speech perception models and set the stage for future experiments that manipulate socio-indexical factors and accent predictability.

TALK 8: THE TRANSMODAL DISTRIBUTED LANGUAGE NETWORK INCLUDES AN INFERIOR TEMPORAL REGION THAT SHOWS SELECTIVITY FOR VISUAL WORD-FORMS

Joseph Salvo, Northwestern University

Modern estimates of the language network include association regions beyond the classic perisylvian areas. The entire distributed network shows responses to spoken or written language, and is identifiable using functional connectivity (FC) within individuals. The network often includes an underemphasized basal region half-way down the posterior-anterior axis of the inferior temporal cortex (ITC). This region is intriguing due to its anatomical proximity to the visual word-form areas (VWFA), which show selectivity for visual stimuli resembling written words. We investigated the relationship between this basal language network area and the VWFA. We recruited 8 healthy adults fluent in English for 8 MRI sessions. Multi-echo 3T functional MRI data were collected to improve signal-to-noise in the ITC. Tasks included an auditory language localizer, a visual category localizer, and a passive fixation task for network estimation. Data were processed using the 'iProc' pipeline, optimized for within-individual data alignment and minimizing smoothing, and were projected to the fsaverage6 surface. In each participant, seed-based FC, data-driven clustering, and a contrast from the auditory language localizer identified a shared set of distributed regions on the lateral surface. All participants demonstrated a language-active region halfway down the ITC's posterior-anterior axis. For all but one participant, this region overlapped with regions showing selectivity for letter strings without established meaning in English, in the visual category task. Neither face nor scene-selective regions overlapped consistently with the basal language region. Our results suggest that the hierarchy for recognizing visual word-forms converges with the transmodal distributed language network in the ITC.

TALK 9: WITHDRAWN

TALK 10: INDIVIDUAL DIFFERENCES IN MULTISENSORY ILLUSORY PERCEPTION

Maggie Baird, Occidental College

We examined individual differences across two auditory-visual illusions: the McGurk Effect and the Sound-Induced Flash Illusion (SIFI). In the McGurk effect, visual information changes what participants hear; when the sound signal 'ba' is paired with a face mouthing 'va', participants often report hearing a fused sound like 'tha'. For the SIFI, sound changes visual perception; when a single visual flash is accompanied by two beeps presented in quick succession, many people report perceiving a second flash even though only one was presented. We were interested in the extent to which people experienced each of these illusions, whether their perceptual experiences were stable over time, and what brain states contribute to illusory perception. 49 undergraduate participants completed two

experimental sessions while their brain activity was recorded using EEG; both sessions included a block of each illusion as well as several types of control trials. We found robust individual variability across both illusions such that some participants always, never, or sometimes experienced the illusions. Susceptibility was stable over time such that across both sessions, people remained either 'seers', 'non-seers', or 'sometimes-seers'. For the SIFI specifically, prior trial type was predictive of whether they would experience the illusion. Moreover, we found neural differences in both central and occipital sites between 'seers' and 'non-seers'. We also report trial-by-trial based EEG analyses demonstrating differences between propensity to experience the two illusions. This study supports and extends the growing literature surrounding individual variability in perception of multisensory illusions.

TALK 11: DECODING SPOKEN WORDS IN THE EARLY VISUAL CORTEX OF SIGHTED AND CONGENITALLY BLIND INDIVIDUALS

Lukasz Bola, Institute of Psychology, Polish Academy of Sciences

In blind individuals, listening to spoken words strongly activates the early 'visual' cortex. However, it is still unclear what properties of spoken words are captured by the early visual areas in the blind, and consequently, what are the implications of this finding for our theories of brain plasticity. To contribute to this debate, we investigated whether early visual cortex activation patterns in blind individuals represent differences between specific spoken words. Furthermore, we asked if some form of spoken word representation can be observed also in the early visual cortex of sighted individuals. We enrolled 20 sighted and 17 congenitally blind participants in an fMRI experiment, in which they listened to spoken words and made semantic decisions on word referents (animals and everyday objects). We used multi-voxel pattern analysis (MVPA) to reveal, in each participant group, brain regions representing differences between words presented during the study. We found that specific spoken words can be decoded from early visual cortex activation patterns in both blind and sighted participants. Furthermore, the searchlight analysis showed that brain networks representing differences between spoken words are overall very similar in both participant groups. We conclude that the overall topography of the spoken word processing networks, as investigated with MVPA, is relatively robust to changes in visual experience. We also suggest that visual cortex responses to spoken words, observed in blind individuals, might originate from neural representation that is computed in this region also in sighted individuals.

TALK 12: PREDICTION IN THE MIDBRAIN: LAYER-DEPENDENT PATTERN OF HUMAN SUPERIOR COLLICULUS ACTIVITY DURING DECISION-MAKING PREDICTS THE MODALITY OF EXPECTED SENSORY STIMULATION

Danlei Chen, Northeastern University

The superior colliculus (SC) is a small structure in the vertebrate midbrain. Evidence from non-human vertebrates shows that the superficial and deep SC layers are involved in visual and somatosensory processing, respectively. Evidence from humans also showed visual and visuomotor processing in SC superficial layers. These studies, however, focused on SC in response to stimulation, rather than prediction. Using 7-Tesla ultra-high-field fMRI (1.1mm isotropic), we localized and measured the human SC BOLD signals during a decision-making task in which a selection between two visually presented shapes was followed by either a visual or somatosensory stimulation in two separate groups of participants (N=40 for each). Across 120 trials, participants actively selected between two shapes or passively viewed a selection made by the computer. The selection was then followed by a neutral or negative stimulation either in the visual domain for some participants (i.e., affective images) or in the somatosensory domain for others (i.e., pressure on the thumbnail). The entire human SC showed greater signals during both active and passive decisions compared to baseline, and greater SC signals in active compared to passive decisions. Critically, superficial SC layers showed greater signals when visual stimulation was expected during decision-making, while deep SC layers showed greater signals when somatosensory stimulation was expected. Thus, layer-dependent SC signals were predictive of the expected sensory stimulation in a manner that was consistent with the anatomical evidence of sensory specificity in SC layers. These results suggest that human SC might be important in the predictive processing during decision-making.

TALK 13: EVIDENCE FROM PROSOPOMETAMORPHOPSIA AND MOUTH-SPECIFIC DISTORTIONS FOR INDEPENDENT REPRESENTATIONS OF INDIVIDUAL FACIAL FEATURES

Alexis Kidder, Dartmouth College; NIMH

Face perception research has largely emphasized holistic processing of faces, and work exploring whether and how individual facial features are represented has been limited. However, recent psychophysical, neuroimaging, and single-unit studies suggest individual facial features may be encoded independently (de Haas et al., 2016; Zhang et al., 2021; Waidmann et al., 2022). Here, we present evidence for mouth-specific representations in the human face processing system from a case study of Willie, a right-handed, 38-year-old man who experiences prosopometamorphopsia (PMO). Willie's day-to-day distortions occur exclusively to mouths, and include whole mouth duplications, illusory mouth motion, and changes to lip shape. We ran a battery of 41 tasks to characterize Willie's distortions. Of the evoked

distortions, 98.7% of the distortions were to faces, and 86% of these distortions only affected mouths. We tested predictions of four alternative accounts of the process producing the distortions: (1) low-level visual processing, (2) general visual object processing, (3) the lower half of viewer-centered face representations, or (4) face-centered mouth-specific representations. To test accounts 1 and 2, Willie viewed 946 low-level simple shapes, common objects and scenes, and reported only 2 distortions evoked by objects. To evaluate accounts 3 and 4, faces were displayed at six different picture-plane orientations. Willie saw distortions to mouths rather than features in the lower half of the face at each orientation. Taken together, these results indicate that Willie's distortions reflect disruptions to feature-specific, face-centered representations. His case indicates that mouths, and other facial features, may be represented independently from each other.

TALK 14: PERCEPTION OF SIGNING AVATARS? MOVEMENT LEADS TO PREDICTIVE PROCESSING AND NON-LINEAR MODEL OF MU / ALPHA FREQUENCY POWER CHANGES

Athena Willis, Gallaudet University

Recent research shows that deaf signers show increased behavioral and neural sensitivity to certain types of movement, such as biological motion, human actions, and signing avatars. However, other work suggests that in deaf signers exposed to signed language before age five, there is minimal involvement of the Mirror Mechanism during the perception of signed languages. The disparity in those findings is a crucial question because of the emergence of signing avatars designed to engage learners' prior embodied experience for learning. To understand the role of the mirror mechanism in the perception of signing avatars' movements, we created stimuli that vary in two ways. Four signers differ in their motion (Familiar or Unfamiliar signing movements) and form (Human or Avatar). We collected EEG oscillations from deaf signers (N = 21) as they watched the movements of individual signed words from four different signers. We conducted ANOVA planned contrasts and time frequency analysis between each signer. We found a significant increase in self-reported behavioral rating of Familiarity with the Familiar Avatar after the EEG experiment. While participants were observing a still Familiar Avatar, we found a significant synchronization in mu frequency compared to other three signers. During the perception of signers' movement, we found a pattern of significant power changes in mu frequency across signers that suggests a non-linear model of sensorimotor processing. Our pre-registered EEG study suggest that during the perception of signed words, deaf signers engage their mirror mechanism for predictive processing and action simulation of human movements.

TALK 15: CORTICAL AND SUBCORTICAL MECHANISMS OF ORTHOGRAPHIC LEARNING

Yuan Tao, Johns Hopkins University

Research on orthographic learning (in reading and dyslexia) has focused largely on cortical mechanisms. However, it is well-understood that verbal learning recruits both subcortical (e.g., hippocampus) and cortical mechanisms. As highlighted in the Complementary Learning Systems framework (McClelland, et al., 1995), these regions instantiate different types of learning mechanisms whose involvement varies over the time-course of learning. To examine orthographic learning in real time, we adapted the Law et al. (2005) associative learning paradigm requiring participants to learn, through trial and error, the relationship between the pronunciations and spellings of pseudo-words during fMRI scanning. Thirteen healthy volunteers learned the pseudo-words in two twenty-minute scanning sessions, with evaluations of in-scanner and post-scan accuracy. We examined BOLD response for learning trials of different levels of memory strength (Smith et al., 2004) in the hippocampus and the left ventral occipital cortex (LVOT; associated with orthographic processing). We found: (1) Both left and right hippocampi showed that activation increased with memory strength (LH: p=0.0021, RH: p=0.0002), whereas the LVOT showed decreased activation (p=0.03); (2) Larger hippocampal BOLD changes were associated with smaller LVOT changes (r=0.68, p=0.004); (3) Higher post-scan accuracy was correlated with greater activation changes of the hippocampi (r=0.61, p=0.01), but not the LVOT (r=0.38, p=0.11). The results reveal two distinct neural mechanisms in the initial orthographic learning stages assessed in this study. Generally consistent with the CLS framework, the hippocampus specifically contributes to better learning outcomes, while decreased activation of the cortical orthographic processing regions may reflect BOLD-adaption/familiarization.

Data Blitz Session 3

Saturday, March 25, 11:00 am - 12:30 pm, Bayview Room

Chair: Simon Davis, Duke University

Speakers: Danika Geisler, Jingyi Wang, Siddhant Iyer, Courtney Jimenez, John Thorp, Shenyang Huang, Stephanie Simpson, Ian Ballard, Nick Wellman, Jia-Hou Poh, Monica Thieu, Victoria Schelkun, Alyssa Sinclair, Wen Jian, Dylan Curtin

TALK 1: SELF-FOCUSED BY DEFAULT: SPONTANEOUS MEDIAL PREFRONTAL CORTEX AND DMN CORE SUBSYSTEM ACTIVITY DURING REST PREDICTS THE DESIRE TO THINK ABOUT THE SELF

Danika Geisler, Dartmouth

People are particularly self-focused. Yet, the basic brain mechanisms that bias us towards self-focus remain unclear. In the main task of our

fMRI session, each trial started with a pre-trial jittered rest, then the trial in which subjects chose who (themselves, a designated friend, or Biden) they wanted to think about in a later task. Parametric modulation analysis of the pre-trial jitter activation with response time to the next trial as the parametric modulator revealed the MPFC during pretrial rest more strongly predicted self (vs friend and Biden) decisions. In other words, stronger 'default' MPFC activation during brief rest biases self-focus on a moment-by-moment basis. Additionally, multi-voxel pattern analysis (MVPA) revealed that spatial patterns in the MPFC during pre-trial rest predict the subsequent choice to think about the self (vs. others) on the next trial. We additionally found that the DMN core is able to predict the subsequent choice to focus on the self (vs. others) more accurately than a) other DMN subsystems and b) the whole brain. Finally, we applied the DMN core MVPA pattern to each TR of a resting state scan that occurred prior to the experimental tasks. During this rest scan, participants periodically rated the extent to which they were thinking about themselves. Participants with DMN core patterns during rest that were highly similar to the pre-trial MVPA pattern reported being the most self-focused during their rest scan. The current results suggest that 'defaulting back' to the MPFC and DMN core subsystem nudges us toward self-focus.

TALK 2: TIME AND EMOTION MODULATE THE INTRINSIC FUNCTIONAL ORGANIZATION OF LATERAL PREFRONTAL CORTEX

Jingyi Wang, University of California, Santa Barbara

Control signals in lateral prefrontal cortex (LPFC) are thought to be organized along a rostro-caudal axis of temporal abstraction, with rostral LPFC (frontopolar cortex/FP) supporting abstract and temporal context-dependent forms of cognitive control (Badre and D'Esposito, 2007; Badre and Nee, 2018). Prior work suggests that the similarity structure of intervoxel functional connectivity patterns in LPFC reflects its intrinsic functional organization, which constrains abstract, goal-directed cognition (Waskom et al., 2017). Here, we used dense sampling fMRI to examine whether the intrinsic functional architecture of LPFC differentially reflects changes in temporal context along the rostro-caudal axis. We also examined whether mood changes differentially explained LPFC functional connectivity patterns given evidence that emotional valence encoding in FP modulates goal-directed cognition (Lapate et al. 2022). Two participants (n=1 Female, 23-y-old; n=1 Male, 26-y-old) underwent daily resting-state scans for n=30 consecutive days. We correlated changes in the similarity of intra-regional functional connectivity patterns in LPFC with changes in elapsed time. We found that the similarity of functional connectivity patterns in FP tracked (and correlated negatively with) elapsed time elapsed over a 30-day period-an association that was attenuated in mid-LPFC, and absent in caudal PFC regions. Moreover, emotional-state changes differentially explained the similarity structure of functional connectivity patterns in LPFC, with the strongest association found in FP, which progressively attenuated in caudal regions. Collectively, these results indicate that time and emotion differentially modulate the intrinsic functional architecture along the rostro-caudal axis of LPFC.

TALK 3: INTER-SUBJECT VARIABILITY IN POST-ENCODING DEFAULT NETWORK CONNECTIVITY EXPLAINS AFFECTS OF SOCIAL MEMORIES

Siddhant Iyer, Dartmouth College

Often after interpersonal conversations, each of us recalls the experience differently; some fondly, some with disdain; some are inspired, some deflated. Previous studies have investigated the role of the brain's default mode network (DMN) in variable interpretations of similar social experiences (Finn et al., 2018), yet the network's role post-encoding has largely been overlooked. Given the importance of post-encoding DMN connectivity in social memory consolidation (Collier & Meyer, 2020), here we asked if people remember the same social experience fondly versus with disdain, in part, because of how their DMN consolidates the experience after encoding. To test this, subjects (N=40) underwent fMRI while completing a baseline rest scan, encoding videos of people sharing emotional information, and a post-encoding rest scan. Next, they freely recalled everything they remembered. We calculated inter-subject similarity in timecourse correlations between DMN regions in each experimental phase and sentiment analysis on recall data. Representational similarity analysis between a) subject-by-subject connectivity similarity during post-encoding rest and b) by-subject memory affect showed that subjects with negative memories exhibited similar DMN connectivity, while those with positive memories exhibited idiosyncratic DMN connectivity. Temporal analyses revealed this post-encoding effect occurs quickly, immediately after encoding. Importantly, we found no effect when analyzing video-watching or baseline rest, ruling out perceptual or trait-level resting state explanations. Connectivity outside the DMN yielded null results, further suggesting specificity to DMN. The findings suggest individual differences in DMN connectivity immediately after social encoding may explain why some recall the same social experience fondly while others with disdain.

TALK 4: DORSOMEDIAL PREFRONTAL CORTEX (DMPFC) PRIORITIZES SOCIAL LEARNING AT REST

Courtney Jimenez, Dartmouth College

As we move through everyday life, we come across an abundance of information. Yet, some experiences stick with us while others are forgotten. Is certain information from encoding prioritized in memory? If so, how? One possibility is that social information-that is, information about people-may be prioritized via consolidation mechanisms at rest. Here, we implement a multivariate neural pattern reinstatement analysis with naturalistic stimuli to show that the amount of social reinstatement in the DMPFC is significantly related to social memory

performance. Additionally, we show that nonsocial reinstatement in the lVLPFC is significantly related to nonsocial memory performance. Critically, a linear mixed effects model reveals that the correlation between the number of DMPFC social pattern reinstatements and social memory performance is driven by early rest. We don't see evidence of the same temporal prioritization in the relationship between the number of lVLPFC nonsocial pattern reinstatements and nonsocial memory performance. Further, we replicate findings that implicate the hippocampus in a general consolidation function at rest. We find that the amount of correct pattern reinstatement in the right hippocampus at rest is negatively correlated with overall memory performance. Collectively, these results suggest that the link between neural pattern reinstatement during rest and subsequent memory may be supported by different prefrontal regions for social (DMPFC) and non-social (lVLPFC) memory. These results provide evidence that the DMPFC, a key region of the default network, prioritizes the consolidation of social information for memory during earlier moments of rest.

TALK 5: HIPPOCAMPO-CORTICAL REPLAY DURING REST SHAPES MEMORY UPDATING

John Thorp, Columbia University

Our understanding of when and how memories update is a burgeoning area of research. Prior work has shown that partial reminders open up a window in which memories can be modified. Recent neuroimaging work has provided evidence that hippocampal univariate activity after these reminders relates to the extent to which memories are updated. We were interested in whether and how partial reminders facilitate reconsolidation by examining neural processes associated with memory consolidation. To this end, we examined post-reminder memory replay during rest and assessed the number and systems-level coordination of replay events using fMRI. Replay was examined locally in the hippocampus as well as across different whole-brain networks. We found that the frequency of replay events for interrupted videos was generally significantly enhanced compared to uninterrupted, or full, videos across both the hippocampus and cortical networks. Similarly, we found that the proportion of simultaneous, coordinated replays between the hippocampus and cortical networks was generally greater for interrupted videos than full videos. Critically, the number and coordination of replay events in some of these areas protected against errors for interrupted videos but led to errors for full videos. Future analyses will explore and characterize the specific relationships between post-reminder memory replay and later memory distortions.

TALK 6: HIPPOCAMPAL INTERACTIONS WITH VISUAL AND SEMANTIC REPRESENTATIONS IN THE CORTEX SUPPORT SUBSEQUENT PERCEPTUAL AND CONCEPTUAL MEMORY

Shenyang Huang, Duke University

fMRI studies of episodic memory have found that subsequent memory is associated with increased univariate activation in the hippocampus and multivariate representation of visual and semantic stimulus features in cortical regions. Nonetheless, it remains unclear how hippocampal functions integrate with distinct cortical representations to facilitate successful encoding. We collected fMRI data while participants encoded images of real-world objects, and then tested their memory for object concepts and image exemplars (i.e., conceptual and perceptual memory). We quantified hippocampal engagement on each trial in four distinct ways: activation level (univariate activity), neural pattern similarity (correlation in activity patterns across objects), and representational strength (using representational similarity analysis, separately for visual and semantic features). While patterns of cortical visual and semantic representations replicated well-known cortical regions (e.g., visual: occipital cortex; semantic: angular gyrus), we found no evidence of visual or semantic representation in the hippocampus. Critically, hippocampal function modulated the impact of cortical representations on subsequent memory in a memory-specific manner, such that hippocampal modulation of visual (or semantic) representations boosted perceptual (or conceptual) memory in regions associated with visual (or semantic) processing. In predicting perceptual memory, hippocampal activity augmented the effects of visual representations in medio-ventral and lateral occipital regions. In predicting conceptual memory, hippocampal activity enhanced the effect of semantic representations in left inferior frontal gyrus and hippocampal semantic representation boosted the effect of semantic representations in angular gyrus. Collectively, these results suggest the particular contribution of hippocampal modulations on cortical representations specific to the type of information and memory demands.

TALK 7: EFFECTS OF AGING, NEURODEGENERATIVE DISEASE, AND MTL DAMAGE ON AUTOBIOGRAPHICAL MEMORY RECALL: A META-ANALYTIC REVIEW OF THE AUTOBIOGRAPHICAL INTERVIEW

Stephanie Simpson, University of Toronto; Rotman Research Institute at Baycrest

The Autobiographical Interview is a standardized method of assessing memory for real-life past experiences. It is widely used to derive separate measures of internal (episodic) and external (non-episodic) details from freely recalled autobiographical narratives. This study aims to synthesize the literature on the Autobiographical Interview across the spectrum of healthy aging and neuropathology-related cognitive decline. Focusing on 46 studies with 1821 participants, we conducted a meta-analysis to quantify the pattern of details generated

during autobiographical memory recall from healthy younger and older adults as well as patients with mild cognitive impairment (MCI), Alzheimer's Disease (AD), and medial temporal lobe (MTL) lesions. Summary statistics for internal and external details along with inferential statistics concerning group differences were extracted from each article. We observed that the Autobiographical Interview is not only sensitive to the effects of normal aging, but also to cognitive decline associated with neurodegenerative disease and extensive MTL damage, with large effects on the generation of episodic details. These data demonstrate that: 1) fewer internal details were generated in aging and patients with suspected (MCI, AD) and confirmed (lesions) MTL-related neuropathology, 2) but only healthy older adults over-produced external details relative to controls. Results from this study extend the canonical episodic memory impairment observed in neurodegenerative disease and MTL lesions to naturalistic measures of memory that are more representative of real life. This work also sheds light on how mnemonic profiles of recovered episodic and non-episodic content can differentiate groups across the spectrum of age- and neuropathology-related impairment.

TALK 8: STRIATAL DOPAMINE INFLUENCES THE HEMODYNAMIC RESPONSE IN HUMANS

Ian Ballard, University of California, Berkeley

The cerebral vascular response has a critical role in satisfying neuronal demands and is the basis for BOLD imaging. Dopamine and vasculature are closely associated as dopaminergic neurons innervate microvessels and dopamine agonists can elicit cerebrovascular dilations (Edvisson et al., 1985; Krimer et al., 1998). In a group of 52 healthy male and female human subjects, we measured a proxy of hemodynamic delay using BOLD fMRI. We also measured dopamine synthesis capacity using the PET radioligand 6-[18F]fluoro-l-m-tyrosine ([18F]FMT). We found spatial differences of hemodynamic lags within the striatum. Hemodynamic responses in the nucleus accumbens, a major target of mesostriatal dopamine, peak an average of .5 seconds later than more dorsal regions of the striatum and much of cortex. Consistent with dopamine having a direct hemodynamic effect, we found a positive correlation between dopamine synthesis capacity as measured by PET and hemodynamic lag in the nucleus accumbens. In addition, in a separate cohort of 19 healthy male and female subjects performing a reward decision making task, we found that lags in the hemodynamic response are reduced by ~1s for positive relative to negative rewards, consistent with dopamine driving a faster hemodynamic response. In sum, we found convergent evidence that dopamine release in the nucleus accumbens leads to a faster hemodynamic response. Moreover, these results raise the possibility that hemodynamic lags in the nucleus accumbens may provide a proxy measure of dopaminergic tone in humans. However, the relationship between hemodynamic responses and dopamine in humans is unclear.

TALK 9: BRAIN WHITE MATTER CHANGES DURING A 1-YEAR ANTARCTIC WINTER-OVER MISSION

Nick Wellman, University of Pennsylvania

Long term spaceflight presents a unique set of stressors that are not well understood. Mitigating adverse effects of space exploration often focuses on the effects of microgravity exposure yet the impact of other variables, such as the isolated, confined, and extreme (ICE) environment created by space exploration, needs to be further explored. Here we measure changes in brain white matter using diffusion MRI in astronaut surrogates who wintered-over in Antarctica, an ICE environment. Crew members who wintered-over (n = 23) were compared to controls who did not (n = 15). Participants underwent MRI before (Pre), immediately after 12 months in the ICE environment (Post 1), and again 6 months later (Post2). Mixed-effects modeling was implemented using longitudinal ComBat to mitigate scanner site effects. Transient increases in axial diffusivity (AD) were found in crew members in the cingulum bundle ($p = 0.008$) and superior longitudinal fasciculi ($p = 0.009$) at Post1 that returned to baseline at Post2. Moreover, ICE-associated change in white matter was associated with cognitive performance, measures of activity, and sleep (Pearson r's > 0.50). Controls showed small, but typical age-related declines in fractional anisotropy in the corticospinal tract ($p = 0.009$), inferior frontal occipital fasciculi ($p = 0.007$), inferior longitudinal fasciculi ($p = 0.02$), and forceps minor ($p = 0.03$). The present data suggest ICE environments transiently alter brain white matter, which may have consequential effects on performance and behavior. Future studies elucidating brain changes after ICE exposure are needed given the interest in extended space explorations.

TALK 10: LINGERING NOVELTY SIGNAL FACILITATES THE FORMATION OF ENDURING EPISODIC MEMORY

Jia-Hou Poh, Duke University

Detection of novelty has been proposed to initiate cascades of neuromodulatory activity beneficial for memory formation. Two key mechanisms proposed are cholinergic modulation of an 'encoding state' and dopaminergic tagging for the consolidation of lasting memories. While studies in humans have provided evidence of enhanced encoding following novelty detection, there is scarce evidence for memory persistence in humans. To examine if the persistence of memory is influenced by the detection of novelty in a preceding image, we analyzed data from the Natural Scenes Dataset. Participants (N = 8) performed multiple sessions of a continuous recognition task (Old/New judgment) where images were presented thrice with repetition intervals ranging from 0 to over 300 days. Analyses included only intervals where recognition accuracy was above chance. On initial presentation, participants were highly accurate in judging that an image is New, but they were also less likely to indicate so if it was preceded by a familiar image ($p < .001$), suggesting lingering mnemonic signals that influence the subjective

experience of novelty. Retrieval was examined using recognition accuracy on the 1st repetition (i.e. 2nd presentation). Unsurprisingly, recognition decreased with longer intervals ($p < .001$). Crucially, images preceded by a Novel image during the first presentation showed a slower rate of decay compared to images preceded by an Old image ($p < .001$). These findings demonstrate that the lingering effects of novelty facilitate the formation of enduring memory. Ongoing fMRI analyses will examine how subjective novelty and memory persistence relate to the engagement of neuromodulatory networks during encoding.

TALK 11: EPISODIC-SEMANTIC LINKAGE FOR $1000: EPISODIC MEMORY BOLSTERS ACQUISITION OF NEW SEMANTIC KNOWLEDGE IN TRIVIA EXPERTS

Monica Thieu, Emory University

Some people exhibit impressive memory for a wide array of semantic knowledge. What makes these trivia experts better able to learn and retain novel facts? We investigated whether episodic memory can bolster learning of novel semantic information in trivia experts. We hypothesized that trivia expertise would be linked to stronger associative binding between complex semantic information and episodic features of an encoding event. 133 participants varying in trivia expertise completed a museum-themed memory task, in which they encoded two 'exhibits' of naturalistic facts paired with related photos. Afterward, participants were tested on cued recall of facts, forced-choice memory for photos, and forced-choice memory for each fact's encoding exhibit. As expected, greater trivia expertise was correlated with higher cued recall for novel facts. Among all participants, source memory for the museum exhibit predicted greater likelihood of fact recall. Conversely, photo memory dissociated trivia experts and non-experts: trivia experts were more likely to successfully recall a fact if they also correctly identified its associated photo, whereas fact recall and photo memory were unrelated among non-experts. These findings suggest that associative episodic memory might scaffold acquisition of new semantic memories in trivia experts They add to a burgeoning line of work highlighting shared cognitive and neural underpinnings of episodic and semantic memories. Finally, our work shows the value of studying trivia experts: a special population that can shed light on the mechanisms of memory.

TALK 12: HIPPOCAMPAL AND CORTICAL ACTIVITY MECHANISMS OF EPISODIC MEMORY

Victoria Schelkun, Columbia University

Though our experiences unfold continuously, they are remembered as individual episodes. Prior work suggests that ongoing contextual stability supports temporal integration of sequential information, and that event boundaries disrupt ongoing integration thus leading to discrete episodes in memory. Event boundaries have been associated with robust effects on memory, yet it remains to be fully understood how the neural mechanisms at and around event boundaries support this process. In this study, we sought to characterize how activity patterns change in response to event boundaries, and how this subsequently affects memory. Participants underwent fMRI scanning while they viewed sequences of images that were organized into events defined by an associated auditory and motor context. Participants were later tested for item memory and temporal memory. We found that activity profiles in hippocampal and event-related cortical regions reflect the event structure, such that event boundaries are associated with a momentary shift in activation in these regions. Furthermore, trial-by-trial hippocampal activity is related to later memory strength and is moderated by associated cortical activity. We then computed levels of pattern separation in hippocampal subfields via measures of similarity between patterns of activity to test for differences in relational encoding representations as a function of the event structure. We find that the dentate gyrus engages in greater pattern separation within events than across events, suggesting a mechanism by which individual items become integrated into an episode in memory. These results shed new light on the dynamic hippocampal and cortical mechanisms by which event boundaries organize memory.

TALK 13: INSTRUCTED MOTIVATIONAL STATES BIAS REINFORCEMENT LEARNING AND MEMORY FORMATION

Alyssa Sinclair, Duke University

Motivation influences goals, decisions, and memory formation. Imperative motivation links urgent goals to actions, narrowing the focus of attention and memory. Conversely, interrogative motivation integrates goals over time and space, supporting rich memory encoding for flexible future use. Here, we manipulated motivational states using cover stories presented before a reinforcement learning task: The Imperative group imagined executing a museum heist, whereas the Interrogative group imagined planning a future heist. Participants repeatedly chose among four doors, representing different rooms of the museum, to sample trial-unique paintings with variable rewards. The next day, participants in both groups performed a surprise next-day memory test. Crucially, only the cover stories differed between the Imperative and Interrogative groups; the reinforcement learning task was identical, and all participants only received payment after the memory test. In an initial sample and a pre-registered replication, we demonstrated that Imperative motivation increased exploitation during reinforcement learning. Conversely, Interrogative motivation increased directed (but not random) exploration. At test, the Interrogative group was more accurate at recognizing paintings and recalling associated values, relative to the Imperative group. In the Interrogative group, higher-value paintings were more likely to be remembered; Imperative motivation disrupted this effect of reward modulating memory. Overall, we demonstrate that a subtle motivational manipulation can bias learning and memory,

bearing implications for education, behavior change, clinical interventions, and communication.

TALK 14: DISSOCIABLE PUPILLARY RESPONSE PATTERNS DURING EXPLICIT AND IMPLICIT MEMORY RETRIEVAL

Wen Jian, Brown University

The pupillary old/new effect refers to the larger pupil dilations elicited by previously studied items compared to new items during recognition memory retrieval; the effect is thought to reflect the strength of the memory trace such that more strongly encoded items elicit larger pupil dilations. In this study, we explore whether this interpretation generalizes to implicit as well as explicit memory retrieval conditions. For the explicit condition, 24 participants (age 18-28 years) rated the likability of concrete words during a study phase and provided an old/new response to words during the test phase. For the implicit condition, a separate group of 24 participants (age 18-28 years) received the same study procedure, but were administered a word-stem completion priming task during the test phase. Priming is reflected in the tendency to complete stems with previously studied words: If larger pupil dilation reflects greater memory strength, then successfully primed items should elicit greater dilation than unsuccessfully primed items. Pupillary data was recorded and analyzed using single-trial linear regression models. The expected pupillary old/new effect was observed in the explicit recognition memory task. However, the opposite pattern of pupillary response was observed in the implicit priming task, with successfully primed words eliciting a smaller pupil dilation than unsuccessfully primed words. These findings challenge the view that the magnitude of pupil dilation during memory retrieval directly reflects the strength of the underlying memory trace, but instead suggests that it reflects the interaction between memory strength and processes engaged under different memory retrieval conditions.

TALK 15: DOPAMINE D2 RECEPTOR BLOCKADE ELIMINATES EXERCISE-INDUCED CHANGES IN CORTICAL INHIBITION AND EXCITATION

Dylan Curtin, Monash University

There is compelling evidence from recent phase-II trials that cardiorespiratory exercise improves clinical outcomes in dopaminergic disorders. Animal models of Parkinson's disease highlight an increase in dopamine D2 receptor expression and enhanced synaptic plasticity as candidate mechanisms driving these benefits, but the link between the D2 receptor and exercise-induced synaptic plasticity in humans is unknown. Here, we examined the effect of a selective dopamine D2 receptor antagonist, sulpiride, on exercise-induced changes in synaptic plasticity. We acquired measures of synaptic excitatory and inhibitory activity of the primary motor cortex using transcranial magnetic stimulation (TMS), both before and after a 20-minute bout of high-intensity interval cycling exercise. We examined the effect of D2 receptor blockade (800 mg sulpiride) on these measures within a randomised, double-blind, placebo-controlled, crossover design. Sulpiride abolished exercise-induced modulation of the cortical excitation:inhibition balance relative to placebo ($p < 0.001$, Cohen's $d = 1.76$). Sulpiride blocked both the increase in excitation and reduction in inhibition that was observed following exercise in the placebo condition. Our results provide causal evidence that D2 receptor blockade eliminates exercise-induced synaptic plasticity, and have implications for how exercise should be prescribed in diseases of dopaminergic dysfunction, such as Parkinson's disease and schizophrenia.

General Information

Meeting Safety Information

Masks recommended in meeting rooms and hand sanitizing stations will be available at registration and also outside each meeting room.

Hotel Safety Information

The safety and well-being of our guests and colleagues is always a top priority. In light of COVID-19 and for precautionary measures, the following services and facilities will be impacted. For inquiries, please contact the hotel directly.

Checking In - You do not need to be vaccinated in order to check into the Hotel.

Limited service available - Food and Bar service.

The Market is open 7 days a week open from 6:00am-10:00pm Sunday-Thursday and 6:00am-11:00pm on Friday - Saturday.

The Eclipse Bar & Restaurant open Monday – Friday: 6:30am - 11:00am and Saturday & Sunday: 7:00am -Noon. (Saturday/Sunday for buffet only $36/ per person.)

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Face coverings- In accordance with the U.S. Centers for Disease Control and Prevention's (CDC) updated face covering guidance based on COVID-19 community levels, face coverings are no longer required for guests and colleagues in U.S. hotels in a low or medium COVID-19 community level, regardless of vaccination status. However guest and colleagues are encouraged to continue to wear face coverings. Learn more about CDC community level designations here.

Americas hotels outside of the U.S. continue to follow local requirements. Guests are encouraged to contact their hotel directly to learn more about specific safety mandates and travel restrictions that may be in place at their hotel. Guests with questions regarding their reservations or upcoming stay may contact Hyatt's Global Care Center.

San Francisco Department of Public Healthy

Safer Return Together Latest Updates - https://www.sfdph.org/dph/alerts/coronavirus.asp

Abstracts

Poster abstracts can be found in the printed program and in the PDF version which is downloadable from www.cogneurosociety.org.

ADA

We look forward to welcoming you to the meeting! If you have a disability or special need that may affect your participation, please contact us at meeting@cogneurosociety.org.

ASL Interpreter Services & Real-Time Captioning Services - Closed Captioning / CART captioning is a speech-to-text interpreting service. Live event captioning benefits attendees who have a hearing loss, are deafened or deaf. If you require CART Transcription Services, please contact us at the Registration Desk located in the Grand Ballroom Foyer to inquire about these services.

Gluten-free - options at coffee breaks/receptions available upon request, please contact us at meeting@cogneurosociety.org.

Hyatt Meeting Room - A ramp to the stage will be provided upon request for speakers. Please contact us at meeting@cogneurosociety.org

Hyatt Regency Hotel ADA Amenities - Emergency strobe lights and strobe light smoke detectors, Cordless phone, Closed-captioned TV, Wide doors, lowered thermostat and light switches, lowered peephole and door latch, Accessible bathroom. Braille on all door signage.

Nursing/Lactation Room - CNS is providing a Nursing/Lactation Room with comfortable seating in the Golden Gate Room of the San Francisco Hyatt Regency Hotel. Email meeting@cogneurosociety.org for more information

ATM

An ATM is located on the Atrium level of the hotel for your convenience.

Audiovisual Equipment for Talks

LCD projectors (e.g., for PowerPoint presentations) will be provided in all rooms where spoken sessions are scheduled; however, computers will NOT be provided. Presenters must bring their own computers and set them up BEFORE the start of the session in which they are presenting. Facilities will be provided to allow several computers to be connected to the LCD projector in a room. Presenters are strongly encouraged to arrive in their scheduled symposium room a minimum

of 30 minutes before their talks so that they know how to set up their equipment.

Baggage Check

The Bell Desk - Assistance with luggage, packages and other carry-on's, is located with the Concierge, next to the front desk.

Business Center

The Business Center is located on the Bay Level adjacent to the Drum Street windows. The following services are available: Copy Services, Facsimile Services, On-Site Computers, Internet Access, Typing Services, and Shipping Services (UPS and FedEx). After staffed hours, the business center can be accessed with your room key to access computers with internet and printing capabilities

Catering

Catering will be available during the conference and is included in the registration fee. *Gluten-free options at coffee breaks/receptions available upon request. Please refer to the table below for the catering times, date and times.

Saturday, March 25

Coffee Break, 3:00 – 3:30 pm, *Pacific Concourse*
Welcome Reception, 6:00 – 7:00 pm, *Atrium*

Sunday, March 26

Continental Breakfast, 8:00 – 8:30 am, *Pacific Concourse*
Coffee Break, 3:30 – 4:00 pm, *Ballroom Foyer*

Monday, March 27

Continental Breakfast, 8:00 – 8:30 am, *Pacific Concourse*
Coffee Break, 3:30 – 4:00 pm, *Pacific Concourse*

Tuesday, March 28

Continental Breakfast, 8:00 – 8:30 am, *Pacific Concourse*

Certificate of Attendance

To receive a Certificate of Attendance please email meeting@cogneurosoceity.org and a certificate of attendance will be emailed to you after the meeting. If you require any changes, we will be happy to email/mail a copy after the meeting. See also Receipts.

Chair People

Please ensure that you are available in your presentation room at least thirty minutes before the start of the session. Persons chairing sessions are asked to keep the talks on time.

Closed Captioning / CART Services

CART captioning is a speech-to-text interpreting service. Live event captioning benefits attendees who have a hearing loss, are deafened or deaf. Streaming text can be viewed on many smart phones, tablets or on the web via laptop. To view the streaming text provided, please visit us at the Registration Counter on the Ballroom floor of the San Francisco Hyatt Regency Hotel to obtain the direct link to view the streaming text. * No special software is required.

Code of Conduct

The Cognitive Neuroscience Society is committed to providing a safe and professional environment during our annual meeting. All CNS members are expected to conduct themselves in a business-like and professional manner. It is unlawful to harass a person or employee because of that person's sex or race. Harassment is defined by any situation that creates a hostile or offensive work environment.

Communications Open House

CNS Public Information Officer Lisa Munoz will answer your questions, give advice, and talk about the communication and press services CNS offers. No appointment needed. Just grab some breakfast and drop in.

Monday, March 27, 8:00 am - 10:00 am, *Regency A Room*

Contact Us

To contact us onsite, visit the Registration Counter on the Ballroom floor of the San Francisco Hyatt Regency Hotel or send an email to meeting@cogneurosociety.org We will respond to your email at our soonest opportunity.

Dance Party

The 30th Anniversary Dance Party will be held in the Grand Ballroom, Saturday, March 25, 8:00-11:00 pm. You must wear your badge to gain entrance. We will start off the night with a local DJ from 8:00PM - 9:30PM followed by a special appearance from Pavlov's Dogz from 9:30PM - 11:00PM

Dietary Restrictions

Gluten Free options are available during Coffee Breaks and at the Welcome Reception upon request. If you have any severe food allergies, please contact us and let us know at meeting@cogneurosociey.org .

Disclaimer

The Program Committee reserves the right to change the meeting program at any time without notice. Please note this program is correct at time of print.

Drink Ticket

Each Attendee will receive two drink tickets; they can be redeemed for alcoholic or non-alcoholic beverages at the Welcome Reception on Saturday.

Attendees registered to attend the 30th Anniversary Dance Party will receive an additional two drink tickets; they can be redeemed for alcoholic or non-alcoholic beverages at the Welcome Reception & 30th Anniversary Dance Party. Lost drink tickets will not be replaced.

Exhibit Hall

The conference exhibit is located in Pacific Concourse Exhibit Hall of the San Francisco Hyatt Regency Hotel. Located in this room are the posters, exhibit booths, and catering. The Exhibit Hall is open to all attendees at the following times:

Saturday, March 25
Open, 3:00 pm – 6:00 pm
Closed for the Day – No Entry hours 6:00 pm – Sunday, 7:30 am

Sunday, March 26
Open, 8:00 am – 7:15 pm
Closed for lunch- No Entry hours 12:00 - 1:30 pm
Closed for the Day – No Entry hours 7:15 pm – Monday, 7:30 am

Monday, March 27
Open, 8:00 am – 5:45 pm
Closed for lunch- No Entry hours 12:00 -1:30 pm
Closed for the Day – No Entry hours 5:45 pm – Tuesday, 7:30 am

Tuesday, March 28
Open, 8:00 am – 12:00 pm
Closed for the Day- No Entry hours 12 noon.

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Hotel

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Eclipse Restaurant & Lounge. Whether you are in the mood for quick refreshment or a full meal, the culinary offerings at Eclipse will satiate you with an unforgettable interpretation of global dining.

Limited service available - Food and Bar service.

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Internet Access

CNS attendees will receive complimentary wireless internet in their guest room. We are pleased to offer free basic wireless internet in all meeting rooms. Ideal for web browsing, social networking, app usage, and checking emails only. **NOT FOR DOWNLOADING OR STREAMING.** Doing so will cause the system to slow down for everyone. Please be courteous.

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Lost & Found

The meeting Lost and Found is located at the Registration Counter on the Ballroom floor of the San Francisco Hyatt Regency Hotel.

Member Services

The member services desk is located at the Registration Counter on the Ballroom floor of the San Francisco Hyatt Regency Hotel. The member services desk will be open at the following times:

Saturday, March 25	11:00 am – 5:00 pm
Sunday, March 26	7:30 am – 4:30 pm
Monday, March 27	8:00 am – 5:00 pm
Tuesday, March 28	Closed

Message Center

Messages for meeting registrants can be left and retrieved at the Registration Counter on the Ballroom floor of the San Francisco Hyatt Regency Hotel. A bulletin board will be available for announcements and job postings.

Mobile Phones

Attendees are asked to silence their mobile phones when in sessions.

Name Badges

The San Francisco Hyatt Regency Hotel and Convention Center is open to public access. For security purposes, attendees, speakers and exhibitors are asked to wear their name badges to all sessions and social functions.

Entrance into sessions is restricted to registered attendees only. Entrance to the Exhibition will be limited to badge holders only. If you misplace your name badge, please go to the Registration Counter on the Ballroom floor of the San Francisco Hyatt Regency Hotel for a replacement.

Nursing/Lactation Room

CNS is providing a Nursing/Lactation Room with comfortable seating in the Golden Gate Room of the San Francisco Hyatt Regency Hotel. Email meeting@cogneurosociety.org for more information

Parking

The Hyatt Regency San Francisco offers indoor valet service with in-and-out privileges (Drumm Street entrance) as well as self-parking (3 Embarcadero Center). Please note this information was correct at time of print.

EVC Charging Stations - Self-Park Garage has 2 Sema Connect charging stations for self-parking. Rates - $2.00 for the first 4 hours, $6.00 for every hour after

Self Parking - Self-parking is currently in Embarcadero 3 and is $35 overnight, no in and out privileges. $35 /Overnight

Valet Parking - In and out privileges. $80 (inclusive of taxes)

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The San Francisco Hyatt Regency Hotel and Convention Center is open to public access. For security purposes, keep your personal belongings secure at all times. Do not leave anything in meeting rooms or the exhibit hall.

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Poster Sessions

Poster sessions are scheduled on Saturday, March 25, Sunday, March 26, Monday, March 27, and Tuesday, March 28. The presenting author must be present during the assigned session and other authors may be present to answer questions. The poster sessions are in the Pacific Concourse Exhibit Hall of the San Francisco Hyatt Regency Hotel. Badges are required at all times. Do not leave personal items in the poster room.

Printed Program

One copy of the printed program booklet is available to each attendee who requested one. If you would like a second copy please check in at the Registration Counter on the Ballroom floor of the San Francisco Hyatt Regency Hotel on the last day of the event. Every effort has been made to produce an accurate program. If you are presenting at the conference, please confirm your presentation times as listed in this program. Attendees will also have the option to view the program by downloading it from our website after the meeting has concluded.

Quiet Lounge

CNS will be providing a quiet lounge area in the Market Street Foyer with comfortable seating.

Receipts

You received two receipts via email, one at the time of purchase and a second with your registration confirmation. Please email the registration desk if you require an additional copy. See also Certificate of Attendance.

Reception

The Welcome Reception will be held in the Atrium, from 6:00-7:00 pm on Saturday, March 25.

Registration

The Registration Counter is located on the Ballroom floor of the San Francisco Hyatt Regency Hotel. The Registration Counter will be open at the following times:

Saturday, March 25	10:00 am – 6:00 pm
Sunday, March 26	7:30 am – 6:30 pm
Monday, March 27	8:00 am – 5:30 pm
Tuesday, March 28	8:00 am – 3:00 pm

Smoking

Smoking is not permitted in or outside any of the meeting rooms or the exhibition hall.

Speakers

All speakers must register and wear name badge to present. Please ensure that you are available in your presentation room at least thirty minutes before the start of the session. See also Audiovisual equipment for Talks.

Transportation

Taxis - There is a taxi stand at the front of the Hotel. A Taxi to or from SFO is about 20-30 minutes and is approximately $50-55.
BART (Bay Area Rapid Transit) -Please visit www.bart.gov for fares and schedules. Station is located within steps of the hotel's front entrance. Approximate one-way fare from San Francisco International Airport $8.65 each way.
Lorrie's Shuttle - Offers service to the Hyatt Regency San Francisco. Shuttles depart every 20 minutes. Board shuttles just outside of the luggage carousels on the lower level of SFO. Fare is $17 from the airport to the hotel.

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Website

http://www.cogneurosociety.org

Exhibits

Exhibitors

Visit our exhibitors in Pacific Concourse and online in the Virtual Platform.

ANT—North America
Brain Vision, LLC
Cambridge University Press
Compumedics-Neuroscan
Cortech Solutions, Inc. (Online Only)
CUNY Graduate Center
FieldLine Medical
gTec Medical Engineering GmbH
Max Plank School of Cognition
mBrainTrain I mbt
The MIT Press
Neuroelectrics
NIRx Medical Technologies, LLC
NITRC
Psychology Software Tools
Soterix Medical

Exhibit Hours

The conference exhibits are located in the Pacific Concourse of the Hyatt Regency San Francisco Hotel. Located in this room are the posters, exhibit booths, and catering. The Exhibit Hall is open to all attendees at the following times:

Saturday, March 25	3:00 pm – 6:00 pm
Sunday, March 26	8:00 am – 12:00 pm 1:30 pm – 7:15 pm
Monday, March 27	8:00 am – 12:00 pm 1:30 pm – 5:45 pm
Tuesday, March 28	8:00 pm – 12:00 pm

**Exhibit Hall closed Sunday and Monday, 12:00 pm – 1:30 pm.*

GSA/PFA Awards

Congratulations to the 2023 winners of the Graduate Student Awards and the Post-Doctoral Fellow Awards.

Graduate Student Award Winners

Joshua Brown, Florida State University
Maxime Carriére, Freie Universität
Yoojeong Choo, University of Iowa
Connor Frank, SDSU/UC San Diego Joint Doctoral Program
Wei-Chin Hsu, National Yang Ming Chiao Tung University
Malte Kobelt, Ruhr-University Bochum
Victoria Liu, University of Toronto
Ricardo Morales-Torres, Duke University
Imogen Weigall, University of South Australia
Bing Shan Wu, National Central University of Taiwan

Post-Doctoral Fellow Award Winners

Xiaoli Zhang, The George Washington University
Xiaochen Zheng, Donders Institute for Brain, Cognition and Behaviour
Roselyne J. Chauvin, Washington University in St Louis
Samuel Cooper, University of Texas at Austin
Serra Favila, Columbia University
Min Kyung Hong, Vanderbilt University
Young Eye Kwon, Northwestern University
Mathieu Landry, Universite de Montreal
Maryam Mahmoudi, University of Minnesota
Kathryn-Mary Wake-Takaki, Albert Einstein College of Medicine

Invited-Symposium Sessions

#	Title	Date	Time	Location
1	Electrophysiological Studies of Human Memory Retrieval	Sunday, March 26	10:00 am - Noon	Ballroom A
2	Learning and Generalization in Humans and Machines	Sunday, March 26	10:00 am - Noon	Ballroom B/C
3	Fulfilling the Promise of Inhibitory Control: Bridging the Gap Between Motor and Cognitive Inhibition	Tuesday, March 28	10:00 am - Noon	Ballroom A
4	Paths to Increased Brain-Behavior Reproducibility	Tuesday, March 28	10:00 am - Noon	Ballroom B/C

Invited Symposium Session 1

ELECTROPHYSIOLOGICAL STUDIES OF HUMAN MEMORY RETRIEVAL

Sunday, March 26, 10:00 am - Noon, Ballroom A

Chair: Nanthia Suthana, UCLA

Speakers: Neal Morton, Nicholas Turk-Browne, Nanthia Suthana, Bradley Lega

Memory retrieval is an essential cognitive function that allows for individuals to access information stored in the past, make decisions, and anticipate future events. By using rare intracranial electrophysiological recordings from patients with implanted electrodes, researchers have been able to investigate the single neuron and oscillatory phenomena that underlie memory processes. This symposium aims to explore data obtained from these clinical opportunities to better understand the complexity of memory, including how it interacts with decision making, episodic boundaries, and spatial and temporal context.

TALK 1: HIPPOCAMPAL-PREFRONTAL REPRESENTATIONS DIFFERENTIATE OUTCOMES THAT VARY BY CONTEXT

Neal Morton, University of Texas

Decision-making in everyday life depends on the context in which choices are made. For instance, answering the phone in your own home is socially appropriate. However, answering your co-worker's phone while visiting their house might be considered less conventional. To support successful decision making, an efficient memory system must thus form representations that code when stimulus-action-outcome relationships vary by context. Here, we leverage both high-resolution fMRI and intracranial electrophysiology across two studies to quantify the emergence of context-dependent coding in hippocampus and prefrontal cortex. In both studies, participants learned about objects with context-dependent reward values in a naturalistic, virtual environment consisting of an elongated, contextually-varying hallway with decision points on either end. During learning, participants learned how the reward value of objects varied as a function of the spatial context during the hallway period. Intracranial electrophysiological data reveal that context dependent memory codes emerge in hippocampus and orbitofrontal cortex during learning. Specifically, we find that theta-gamma phase-amplitude coupling differentiates object-reward relationships by context, with such differentiation emerging from early to late learning. Furthermore, we find that later in learning, such codes are predictively reactivated in the hallway in anticipate of choice. Our fMRI data further reveal that context-dependent memory codes formed in hippocampus and orbitofrontal cortex support rapid generalization of knowledge to new object-reward relationships. Collectively, these findings show how memory representations formed in hippocampus and orbitofrontal cortex support adaptive decision making, promoting selection of the right action in any given context.

TALK 2: MEMORY PREDICTION AND REACTIVATION IN HUMAN ELECTROPHYSIOLOGY

Nicholas Turk-Browne, Yale University

Memory retrieval allows us to both reminisce about the past and to anticipate the future. In this talk, I will present two recent studies from our lab that illustrate these functions of retrieval, respectively. Each relies on a unique strength of human electrophysiology in epilepsy patients. The first study exploits the temporal precision and broad coverage of hospital-based intracranial EEG from acute implants to explore interactions between statistical learning and episodic memory. We show that learned predictions, reflected in multivariate evidence for the category of an upcoming stimulus immediately before its appearance, interferes with episodic encoding of the current stimulus that triggered the prediction. The second study exploits the portability and flexibility of ambulatory intracranial EEG from chronic implants to explore spatial navigation and memory reactivation. We show that the hippocampus represents various features of real-world navigation along a linear track and that these features can be associated with sounds and later reinstated during rest. These studies reveal the richness and complexity of memory representations and the fundamentally interactive nature of memory systems.

TALK 3: DYNAMIC NEUROPHYSIOLOGICAL REPRESENTATIONS OF MEMORY DURING REAL-WORLD NAVIGATION IN HUMANS

Nanthia Suthana, UCLA

The ability to recall memories of personal experiences is critical for everyday behavior and requires retrieval of the associated spatial context in which the memories are formed. Based on data from freely-moving animals, theta activity in the hippocampus is thought to be important for spatial navigation and memory. However, free recall studies in humans show mixed findings with regards to the specific role of theta oscillations in memory retrieval. This talk will present intracranial electroencephalographic (iEEG) data recorded from human participants navigating real and virtual environments while they recalled specific memories. Altogether, results demonstrate how human hippocampal theta oscillations are dynamically modulated by successful memory, saccadic eye movements, and spatial position depending on momentary task goals during freely-moving spatial navigation.

TALK 4: SCHEMA, DRIFT, AND EPISODIC BOUNDARIES: A NEW LOOK AT PRIMACY EFFECTS IN FREE RECALL

Bradley Lega, University of Texas Southwestern Medical Center

Recent evidence from human intracranial recordings have identified boundary—related activity in the MTL and neocortex, both during spatial navigation and verbal episodic processing. Single unit recordings specifically include examples of boundary—type cells in the hippocampus. The role of boundary representations in episodic construction theory supports a possible connection with classical properties of episodic memory behavior such as primacy and recency effects. We test how boundary information may interact with key components of temporal episodic information, namely representational drift. Using a dataset of 108 subjects performing free recall during the acquisition of intracranial recordings, we model both temporal drift and item—level reinstatement across encoding lists, by fitting general linear models. This revealed differences in temporal drift (slope of the autocorrelation signal) for primacy, middle list, and recency items, consistent with boundary—like representations that "anchor" temporal context. In posterior temporal regions, we also find item—level reinstatement that we interpret as consistent with "schema like" representations, in which individual serial positions exhibit heightened similarity across lists. This finding lies in contrast to the drifting changes predicted by the temporal context model. We find no evidence of phase coding for serial position. We consider how these observations may suggest potential integration of complementary models of episodic processing.

Q&A PERIOD

The speakers will take questions from the audience.

Invited Symposium Session 2

LEARNING AND GENERALIZATION IN HUMANS AND MACHINES

Sunday, March 26, 10:00 am - Noon, Ballroom B/C

Chair: Anna Schapiro, University of Pennsylvania

Speakers: James Whittington, Judy Fan, Ellie Pavlick, Dan Yamins

Humans have remarkable capacities for learning and generalization across environments and timescales. They can learn rapidly in novel environments, integrate information gracefully over long periods of time, and generalize acquired knowledge flexibly across disparate contexts. Imbuing machines with these crucial capabilities is of great recent interest both for artificial intelligence applications and for building neural simulations as tools to help us understand the mind and brain. This symposium will explore learning and generalization processes across the domains of memory, language, action, and perception. The speakers will examine what kinds of learning humans are capable of, what current machine learning systems are capable of, and what the matches and mismatches can tell us about mechanisms of learning and representation.

TALK 1: HOW TO ORGANISE KNOWLEDGE FOR FLEXIBLE BEHAVIOUR

James Whittington, Stanford University & University of Oxford

Animals behave flexibly, seamlessly generalising knowledge between apparently different scenarios. This is the hallmark of intelligence. To do this, representations and computations in the brain must also be flexible and generalise. Here we describe several pieces of work on understanding the representations of tasks that can be decomposed into separate building blocks. First, we describe a hippocampal model for learning building blocks and generalising them to novel situations. This model accounts for numerous cell types in hippocampus and entorhinal cortex, and can be related to transformer neural networks. Second, we describe a theoretical result that says different building blocks should be represented by different neural populations, and accounts for novel data such as grid cells warping. Last, we investigate how individual building blocks should be represented and in doing so provide a normative theory of entorhinal grid cells.

TALK 2: DISCOVERING ABSTRACTIONS THAT BRIDGE PERCEPTION, ACTION, AND COMMUNICATION

Judy Fan, University of California San Diego & Stanford University

Humans display a remarkable capacity for discovering useful abstractions to make sense of and interact with the world. In particular, many of these abstractions are portable across behavioral domains, manifesting in what people see, do, and talk about. For example, people can visually decompose objects into parts; these parts can be rearranged to create new objects; the procedures for doing so can be

encoded in language. What principles explain why some abstractions are favored by humans more than others, and what would it take for machines to emulate human-like learning of such "bridging" abstractions? In the first part of this talk, I'll discuss a line of work investigating how people learn to communicate about shared procedural abstractions during collaborative physical assembly, which we formalize by combining a model of linguistic convention formation with a mechanism for inferring recurrent subroutines within the motor programs used to build various objects. In the second part, I'll share new insights gained from extending this approach to understand why the kinds of abstractions that people learn and use varies between contexts. I will close by suggesting that embracing the study of such multimodal, naturalistic behaviors in humans at scale may also shed light on the mechanisms needed to support fast, flexible learning and generalization in machines.

TALK 3: SYMBOLS AND COMPOSITIONALITY IN LARGE ARTIFICIAL NEURAL NETWORKS

Ellie Pavlick, Brown University

Recent advances in artificial intelligence have produced neural network models that achieve impressive results on tasks involving language and vision, and which often appear to exhibit human-like behaviors such as compositionality and productivity. This talk will probe the extent to which such models have representations that could arguably be viewed as "symbolic" or "compositional", and will discuss how the underlying representations contribute to the models ability (or lack thereof) to generalize outside of their training distributions.

TALK 4: HOW WELL DO UNSUPERVISED LEARNING ALGORITHMS EXPLAIN ACTUAL HUMAN LEARNING?

Dan Yamins, Stanford University

Humans learn from visual inputs at multiple timescales, both rapidly and flexibly acquiring visual knowledge over short periods, and robustly accumulating online learning progress over longer periods. Modeling these powerful learning capabilities is an important problem for computational visual cognitive science, and models that could replicate them would be of substantial utility in real-world computer vision settings. I'll discuss recent work we've done to establish benchmarks for both real-time and life-long continual visual learning. Our real-time learning benchmark measures a model's ability to match the rapid visual behavior changes of real humans over the course of minutes and hours, given a stream of visual inputs. Our life-long learning benchmark evaluates the performance of models in a purely online learning curriculum obtained directly from child visual experience over the course of years of development. We evaluate a spectrum of recent deep self-supervised visual learning algorithms on both benchmarks, finding that none of them perfectly match human performance, though some algorithms perform substantially better than others. We present analysis indicating that the better algorithms succeed primarily due to their ability to handle sparse low-diversity datastreams that naturally arise in the real world, and that actively leveraging memory through negative sampling appears useful for facilitating learning in such low-diversity environments.

Q&A PERIOD

The speakers will take questions from the audience.

Invited Symposium Session 3

FULFILLING THE PROMISE OF INHIBITORY CONTROL: BRIDGING THE GAP BETWEEN MOTOR AND COGNITIVE INHIBITION

Tuesday, March 28, 10:00 - 12:00 pm, Ballroom A

Chair: Jan R. Wessel, University of Iowa

Speakers: Jan R. Wessel, Dace Apšvalka, Earl K. Miller, Ryan J. Hubbard & Lili Sahakyan

Inhibitory control is one of the core mechanisms through which the brain enables flexible, goal-directed behavior, and features prominently in many highly influential psychological theories. In those theories, inhibitory control purportedly regulates a wide range of lower-order processes, ranging from urges and emotions to memory and language. However, there is a substantial gap between these psychological theories on the one hand and cognitive neuroscience of inhibitory control on the other hand. The latter field has, for the last three decades, focused heavily on the inhibitory control of movement – for example, during the stopping of actions. This substantial body of work has outlined a cortico-subcortical circuit underlying motoric inhibition and its purported neural signatures – predominantly, beta-band activity in the local field potential. However, disproportionately little research has focused on whether this neural mechanism actually inhibits non-motor activity – including the processes central to the above-mentioned psychological theories. To fill this gap, this symposium will highlight recent converging evidence from fMRI, EEG, deep-brain stimulation, and intracranial studies, all suggesting that the same neural mechanisms involved in inhibiting action may indeed serve to inhibit non-motor activity. As such, this symposium should be of interest to cognitive neuroscientists interested in executive functions, psychologists interested in the neural mechanisms that regulate thoughts and actions, and clinical scientists working on disorders ranging from ADHD and PTSD to gambling disorder and Parkinson's disease.

TALK 1: THE UNIVERSAL ROLE OF INHIBITORY CONTROL IN FLEXIBLE BEHAVIOR AND COGNITION

Jan R. Wessel, University of Iowa

Inhibitory control is one of the fundamental mechanisms by which the brain regulates behavior. Cognitive neuroscience work on inhibitory control has outlined the likely role of a cortico-subcortical mechanism

involving frontal cortex and the subthalamic nucleus in the inhibition of movement. Most of this work stems from paradigms like the stop-signal task, in which prepotent actions have to be suddenly inhibited following an explicit signal. In this talk, I will outline work that crucially expands this picture in two ways. First, I will briefly describe a series of studies showing that fronto-subthalamic inhibitory control mechanisms are activated by a multitude of control-demanding stimuli – including many that do not explicitly require inhibitory control. Then, I will describe recent work suggesting that this same mechanism may be involved in the inhibitory regulation of active non-motoric representations, including active task set representations held in working memory. In doing so, I hope to promote a wider view of the fronto-subthalamic inhibitory control circuit as a ubiquitous mechanism for cognitive and motoric flexibility – one that enables goal-directed behavior in a wide array of scenarios that necessitate rapid adjustments to both ongoing thoughts and actions.

TALK 2: TOP-DOWN CONTROL BY BETA RHYTHMS

Earl K. Miller, Massachusetts Institute of Technology

Working memory is the sketchpad of consciousness, the fundamental mechanism the brain uses to gain flexible, volitional control over its thoughts and actions. For the past 50 years, working memory has been thought to rely on cortical neurons that fire continuous impulses that keep thoughts "online". However, new work from our lab has revealed more complex dynamics. The impulses fire sparsely and interact with brain rhythms of different frequencies. Higher frequency gamma (> 35 Hz) rhythms help carry the contents of working memory while lower frequency alpha/beta (~8-30 Hz) rhythms act as control signals that gate access to and clear out working memory. In other words, a rhythmic dance between brain rhythms may underlie your ability to control your own thoughts.

TALK 3: RECRUITMENT OF DOMAIN-GENERAL INHIBITORY CONTROL SUPPORTS SUPPRESSION OF ENCODING OF EPISODIC MEMORIES

Ryan J. Hubbard & Lili Sahakyan, University of Illinois Urbana-Champaign

Not every experience is something we want to remember, and the ability to stop encoding of information into memory can be adaptive. Research using the directed forgetting method suggests that humans can strategically forget information, but the mechanisms underlying this process remain debated. The selective rehearsal account claims that forgetting is a passive process, whereas cognitive neuroscientific work indicates active engagement of the prefrontal cortex following cues to forget, suggesting recruitment of inhibitory processes to suppress encoding. In this talk, I will present work that directly tested the role of inhibition in encoding suppression with a cross-task design, relating the behavioral and EEG data from participants completing a Stop Signal task – a task specifically testing inhibitory processing abilities – to a novel item-method directed forgetting task with both encoding suppression (Forget) and thought substitution (Imagine) cues. Behaviorally, Forget and Imagine cues produced similar rates of forgetting, but through separable neural processes, with Forget cues eliciting frontal oscillatory power changes that were predictive of future forgetting. Importantly, Stop Signal task performance (SSRTs) was correlated with successful forgetting, and brain-behavior analysis demonstrated that engagement of right-frontal beta activity following motoric stopping was related to successful forgetting. Finally, classifiers trained on neural signals discriminating successful and unsuccessful motoric stopping could also classify successful and unsuccessful forgetting following Forget cues. Finally, I will speculate on what the inhibitory system is "acting upon" to suppress encoding - namely, the binding of item information to the ongoing context, rather than the representation of the item itself.

TALK 4: A COMMON BRAIN MECHANISM FOR STOPPING UNWANTED ACTIONS AND MEMORIES

Dace Apšvalka, MRC Cognition and Brain Sciences Unit, University of Cambridge

Stopping unwanted memories is essential to mental health and well-being, and so is stopping unwanted physical actions. Could there be a common mechanism that allows us to stop both unwanted memories and actions? The research on memory stopping and action stopping has primarily been independent of each other. There is a general agreement that the right prefrontal cortex (PFC) is critically involved in inhibitory control. Memory control research has highlighted the importance of the right dorsolateral PFC controlling the hippocampus. The action control research has highlighted the importance of the right ventrolateral PFC controlling the primary motor cortex (M1). Are the two PFC regions indeed controlling only a specific domain, or could they be involved in controlling both memories and actions? We integrated the separate bodies of research and examined the potential domain-general mechanisms of inhibitory control of memories and actions in the same individuals. Moreover, we investigated how a common mechanism could govern memory and action stopping if they are mediated by distinct neural systems (hippocampus and M1, respectively).

Q&A PERIOD

The speakers will take questions from the audience.

Invited Symposium Session 4

PATHS TO INCREASED BRAIN-BEHAVIOR REPRODUCIBILITY

Tuesday, March 28, 10:00 - 12:00 pm, Ballroom B/C

Chair: Nico Dosenbach, Washington University in St. Louis

Speakers: Scott Marek, Stephanie Noble, Thomas Yeo, Russ Poldrack

Linking brain MRI metrics to human behavioral variables has been a main endeavor of cognitive neuroscience. MRI has greatly elevated our understanding of the human brain through many well-replicated studies mapping abilities to specific structures and functions. Just as for psychology, genomics and medicine, concerns have been raised about the reproducibility of some brain-behavior associations, due to methodological variability, data mining for significant results, overfitting, confirmation and publication biases and inadequate statistical power. This symposium will first highlight the critically important differences across brain-behavior association types (i.e., task fMRI vs. Brain-Wide Association Studies [BWAS]). Next, the presenters will discuss approaches and methods for improving the reproducibility of correlations between task fMRI and resting-state functional connectivity (RSFC) metrics and behaviors.

TALK 1: BRAIN-WIDE ASSOCIATION STUDIES: A YEAR IN REVIEW

Scott Marek, Department of Radiology, Washington University of School of Medicine

Recent work from our group called for sample sizes into the thousands for reproducibility in brain-wide association studies (BWAS). In this talk, I will discuss the mechanism by which small samples have undermined BWAS and the need for large samples for reproducibility and generalizability. I will provide further clarification on the critical differences between BWAS and non-BWAS MRI, with a focus on leveraging the strengths of each approach to inform one another. We suggest the choice in study design (BWAS vs. non-BWAS) should align with a priori defined study goals to propel functional MRI towards practical and clinical utility. As an early career neuroimaging researcher with relatively fewer monetary resources than senior scientists, I will conclude my talk with a practical discussion on how I envision balancing relatively limited resources with the desire to perform robust and reproducible research.

TALK 2: CONSIDERATIONS FOR IMPROVING MEASUREMENT RELIABILITY AND VALIDITY IN FMRI

Stephanie Noble, Department of Radiology and Biomedical Imaging, Yale University

Measurement reliability (i.e., stability of a measure) and validity (i.e., innate correspondence of a measure with a target) are desirable and complementary facets for understanding the practical utility of a measure. The reliability and validity of fMRI is just beginning to be fully empirically characterized with the advent of larger-than-ever datasets and efficient computational methods. However, recent reports have pointed to limitations in both reliability and validity for typical fMRI studies, with particularly heightened attention to low test-retest reliability and power in the past several years. Reflecting on my recent work, I will discuss practical choices fMRI researchers can make to improve test-retest reliability and power. In particular, I will highlight how researchers can improve both simultaneously by 1) moving beyond the level of individual voxels and edges to large-scale and multivariate analytical methods, and 2) using bigger and deeper data. Finally, I will highlight the importance of making choices that improve reliability so long as they do not diminish validity.

TALK 3: INSIGHTS FROM LARGE-SCALE DATASETS FOR OPTIMIZING STUDY DESIGN AND BOOSTING PREDICTION ACCURACY

Thomas Yeo, Centre for Sleep & Cognition, National University of Singapore

Studies have shown that more participants and greater scan time improve prediction of behavioral traits from resting-state functional connectivity. Here we ask the following question: given a fixed scan budget, should we scan more participants (for shorter duration), or less participants (for longer duration) to maximize behavioral prediction accuracy? Surprisingly, we find that total scan duration (number of participants * scan time per participant) explains prediction accuracy of cognitive performance remarkably well (with some caveats). This relationship generalizes across cognitive scores and datasets, and might be potentially useful for future study design. In a second line of work, we propose a meta-matching framework to translate predictive models trained from a large dataset to predict new phenotypes in a small dataset. We demonstrate that meta-matching can greatly boost the prediction of new phenotypes in small independent datasets in many (although not all) scenarios.

TALK 4: IMPROVING ROBUSTNESS AND IINTERPRETABILITY IN BRAIN-BEHAVIOR MODELING

Russ Poldrack, Department of Psychology, Stanford University

When we identify a relationship across individuals between task fMRI activation and a behavioral measure or group variable, we generally wish to interpret this as reflecting differences between the neural computations performed across those individuals. However, this interpretation suffers from a potential confound: Whenever response times differ across conditions, it is possible that differential activity could simply reflect differences in the duration of neural engagement, rather than differences in the kind of neural processing being engaged. The relationship between time on task and activation has been acknowledged for more than a decade, yet most task fMRI studies still do not address this potential confound. I will outline an approach for the effective modeling of response times in task fMRI data, showing that it can provide much more interpretable maps of task activation by differentiating task-specific effects from more general response time effects. I will also outline how response time differences between subjects can leak into brain-behavior correlation analyses at the group level, endangering the interpretability of observed brain-behavior correlations.

Symposium Sessions

#	Title	Date	Time	Location
1	Stable Perception in the Wavering Brain - Reconciling Perceptual Stability with Dynamic Neuronal Representations	Sunday, March 26	1:30 - 3:30 pm	Bayview Room
2	'Stop Thinking About It!': Cognitive and Neural Mechanisms of the Removal and Inhibition of Information in Memory	Sunday, March 26	1:30 - 3:30 pm	Ballroom A
3	The Data Science Future of Cognitive Neuroscience	Sunday, March 26	1:30 - 3:30 pm	Seacliff Room
4	Beyond the Brain: Tracking Mind and Brain through the Periphery	Sunday, March 26	1:30 - 3:30 pm	Ballroom B/C
5	Can't Stop Won't Stop: Statistical Learning Persists through Development, Brain Damage and Competing Demands	Monday, March 27	10:00 am - Noon	Ballroom B/C
6	Neurocomputational Accounts of Agency	Monday, March 27	10:00 am - Noon	Seacliff Room
7	Events and Their Boundaries: A Developmental Perspective	Monday, March 27	10:00 am - Noon	Bayview Room
8	From Observed Experience to Concepts: Multiple Views on the Mechanisms of Concept Formation in the Human Brain	Monday, March 27	10:00 am - Noon	Ballroom A
9	In Memoriam Leslie G. Ungerleider (1946-2020)	Tuesday, March 28	1:30 - 3:30 pm	Ballroom B/C
10	The Brain is Complex: Have we Been Studying it all Wrong?	Tuesday, March 28	1:30 - 3:30 pm	Ballroom A
11	Altered States of Cognition: The Acute and Persisting Consequences of Psychedelic Drugs on Cognition	Tuesday, March 28	1:30 - 3:30 pm	Bayview Room
12	Methodological Advances in the Study of Autobiographical Memory	Tuesday, March 28	1:30 - 3:30 pm	Seacliff Room

Symposium Session 1

STABLE PERCEPTION IN THE WAVERING BRAIN - RECONCILING PERCEPTUAL STABILITY WITH DYNAMIC NEURONAL REPRESENTATIONS

Sunday, March 26, 2023, 1:30 PM - 3:30 PM (PT), Bayview Room

Chair: Leon Deouell, The Hebrew University of Jerusalem

Speakers: Laura Nicole Driscoll, Adam Kohn, Leon Deouell, Rafael Malach

A central goal of cognitive neuroscience is to find forms of isomorphism between behavior, including perception and action, and neural activity. A critical challenge to this endeavor is the finding that the same perceptual experience or the same motor behavior could be associated with varying neural signals, a phenomenon known as representational drift. For example, neural signals quickly habituate upon repetition of a stimulus or when the stimulus doesn't change, but the perception does not seem to dim. Well learned, routine motor processes can be associated with differing neural signals from day to day. These glaring dissociations between subjective perception and overt action on the one hand and neural signals on the other hand raise fundamental questions about the nature of neural representation. If the same perceptual experience or the same behavior are associated with different neural signals at different times of measurement, in what way are the neural signals representative of the behavior? The question has major implications to diverse fields, from understanding the neural correlates of conscious awareness, to the development of reliable brain-computer interfaces that can infer intentions from neural signals and activate external devices. In this symposium we bring together findings and models from mice to humans, from single units to intracranial LFPs, across the brain and across temporal scales from sub-seconds to days, in an attempt to reconcile variability with stability.

TALK 1: DYNAMIC REORGANIZATION OF NEURONAL ACTIVITY PATTERNS IN PARIETAL CORTEX

Laura N. Driscoll, Stanford University

Neuronal representations change as associations are learned between sensory stimuli and behavioral actions. However, it is poorly understood whether representations for learned associations stabilize in cortical association areas or continue to change following learning. We tracked the activity of posterior parietal cortex neurons for a month as mice stably performed a virtual-navigation task. The relationship between cells' activity and task features was mostly stable on single days but underwent major reorganization over weeks. The neurons informative about task features (trial type and maze locations) changed across days. Despite changes in individual cells, the population activity had statistically similar properties each day and stable information for over a week. As mice learned additional associations, new activity patterns emerged in the neurons used for existing representations without greatly affecting the rate of change of

these representations. We propose that dynamic neuronal activity patterns could balance plasticity for learning and stability for memory.

TALK 2: COMMUNICATION SUBSPACES: A MMECHANISM FOR FLEXIBLE INTERAREAL SIGNALING

Adam Kohn, Albert Einstein College of Medicine

Perception fluctuates over time and depends on context and goals, even for a fixed sensory input. One hypothesis is that such fluctuations in perceptual experience are due to altered interactions between the many cortical areas involved in sensory processing. I will present recent work that explores how different early visual cortical areas interact under different stimulus and behavioral conditions. In our approach, we leverage simultaneous measurement of neuronal population spiking activity in different areas of macaque cortex to understand principles of inter-areal communication. Across experimental conditions, we find that inter-areal interactions occur in a low-dimensional subspace—the communication subspace—of the measured population activity. The communication subspace defines which neuronal population activity patterns are effectively propagated to downstream targets, and which remain private to the source areas. Changes in neural activity that fall in the private subspace are not propagated between areas and thus would not be expected to affect perception. We propose that communication subspaces offer a new framework for understanding flexible and dynamic functional interactions between different brain areas and for elucidating which patterns of neural activity contribute to perceptual experience.

TALK 3: STABLE CONSCIOUS EXPERIENCE IS REPRESENTED BY TIME-INVARIANT NEURAL PATTERNS

Leon Y Deouell, The Hebrew University of Jerusalem

Everyday experience contains many instances where sensory input is stationary, and so is our conscious experience of it. However, neural activity dramatically decreases shortly after the onset of a new stimulus, even when the stimulus remains unchanged. This glaring dissociation between subjective experience and neural signals presents a critical challenge for any theory of the neural basis of conscious experience. We used intracranial recordings from ten human patients viewing images from variable categories with multiple durations. Our findings reveal that the distributed neural representation of categories and exemplars in posterior-sensory regions remains sustained and stable for the duration of the stimulus, mirroring the stability of conscious experience, despite a five-fold neural activity attenuation. Furthermore, we find transient frontoparietal representations linked to stimulus onset, despite an absence of behavioral responses. Together, our results provide strong evidence that sustained perception is maintained by time-invariant spatial patterns in sensory regions while frontoparietal regions reflect perceptual changes. We suggest that the content of a visual experience is embedded in a lower order 'experience subspace', or manifold, within the high dimensional space of neuronal activity. The evident dissociation between the variability of response magnitudes and the invariance of distributed representations advocates a shift from activation-based to information-based understanding of perception and experience. The findings directly inform recent large-scale attempts to test theories of consciousness and support elements of both the Global Neuronal Workspace and the Integrated Information Theories of conscious experience.

TALK 4: RELATIONAL CODING UNDERLIES THE STABILITY OF PERCEPTUAL CONTENT IN HUMAN VISUAL CORTEX

Rafael Malach, Weizmann Institute of Science, Israel

A fundamental question in visual neuroscience concerns the neuronal coding of visual percepts. It is generally assumed that response magnitude is central to this process. This assumption is supported by diverse experiments such as binocular rivalry and backward masking. However, this notion was challenged by findings in intra-cranial recordings conducted in patients. These studies demonstrated that the absolute magnitude of neuronal activations to stationary visual stimuli rapidly and dramatically declines, within about a second, during which perception remains highly stable. While this decline in activation poses a serious challenge to the presumed link between activation magnitude and perception, it offers a unique opportunity to identify the neuronal coding that underlies extended perception. Here we report on an intracranial IEEG study in which multiple (2571 contacts) recordings were made in visual and fronto-parietal areas in 13 patients, undergoing a clinical diagnosis for epilepsy. The patients' task was to memorize and recall vivid images of famous faces and places presented for 1.5 seconds each. We find that while activation (High-frequency-broad-band) magnitude rapidly declined to about 25% of its initial level, the profiles (relative activations across contacts) of activation patterns and their relational structures –i.e. the similarity distances between these profiles, were sustained in high-order visual areas. These results are compatible with the hypothesis that perceptual content is coded by the profiles of neuronal patterns and their similarity relations, rather than the overall activation magnitude, in human visual cortex. The role of the activation magnitude (local Ignitions) in perception remains to be elucidated.

Symposium Session 2

'STOP THINKING ABOUT IT!': COGNITIVE AND NEURAL MECHANISMS OF THE REMOVAL AND INHIBITION OF INFORMATION IN MEMORY

Sunday, March 26, 2023, 1:30 PM - 3:30 PM (PT), Grand Ballroom A

Chair: Marie Banich, University of Colorado Boulder

Speakers: Marie Banich, Sara Festini, Lili Sahakyan, Michael Anderson

How does one suppress a thought or a memory? This question has been vexing as it is difficult to know how to detect the disappearance of a memory trace. However, cognitive and cognitive neuroscience research is now shedding light on this issue. From that perspective, the goal of this symposium will be to explore recent theoretical ideas and empirical findings that provide insights into how information is removed or inhibited in memory. Evidence from behavioral approaches, functional neuroimaging, and EEG will be used to address this important issue. The first two talks will focus on these mechanisms with regards to working memory, while the second two will focus on mechanisms with regards to long-term memory. Distinct methods by which information may be removed, such as replacement vs. suppression, will be considered. These recent studies suggest an important contrast between the mechanisms invoked for the removal of information from working memory, which requires a shift of attention away from a thought and/or the likely inactivation of a representation, as compared to long-term memory, which may be accomplished by shutting down access to or processing of the hippocampus and/or modality-relevant regions of posterior cortex. Finally, the implications of these findings for psychopathological states, such as recurrent and intrusive (negative) thoughts will be considered.

TALK 1: REMOVAL OF INFORMATION FROM WORKING MEMORY VIA THREE DISTINCT MECHANISMS

Marie Banich, University of Colorado Boulder

How can we as scientists determine when someone has stopped thinking of something? Said differently, how can we find an experimental signature of a thought that no longer exists? In this talk I will discuss our behavioral and neuroimaging research that addresses this question to elucidate the cognitive control mechanisms that allow information in working memory to be actively removed. Our approach, using a marriage of functional neuroimaging and machine learning techniques (including multi-voxel pattern analysis), along with with behavioral experiments has been able to follow the trace of a thought and then verify that it has indeed been removed. Moreover, this research provides evidence of at least three distinct ways of removing information from working memory: by replacing it with something else, by specifically targeting it for suppression, and by clearing the mind of all thought. In this talk, I will discuss a) the neural mechanisms that enable each of these three types of operations, b) provide evidence regarding the time course of each removal operation, and c) elucidate the consequences of these removal operations for the encoding of new information, which is critical for new learning. I will briefly discuss the implications of this work for psychological and psychiatric disorders, many of which are characterized by recurrent or intrusive thoughts that individuals cannot remove from the current focus of attention.

TALK 2: DIRECTED FORGETTING WITHIN WORKING MEMORY: EVIDENCE FOR SUCCESSFUL REMOVAL AND AN ACTIVE MECHANISM

Sara Festini, University of Tampa

Directed forgetting is one method to voluntarily remove information from working memory. After encoding a small number of memoranda, participants are instructed to forget certain items and to remember other items. Following a short delay of several seconds, participants perform an item-recognition task to indicate whether or not a presented probe was a to-be-remembered item. Here, I discuss a series of experiments that utilized this Sternberg item-recognition working memory task with a directed forgetting manipulation, to evaluate the consequences and mechanisms of directed forgetting within working memory. In some experiments, semantic interference was induced by presenting associatively related memory lists. In other experiments, familiarity-based proactive interference was induced by presenting probe items that had been studied on the prior working memory trial instead of the current trial (i.e., recent probes). Results indicated that directed forgetting cues successfully reduced the level of both semantic interference and proactive interference for to-be-forgotten information relative to both to-be-remembered information and a control encode-only condition. Moreover, an attention-demanding articulatory suppression manipulation disrupted directed forgetting efficacy, providing evidence for an active mechanism. Finally, similar directed forgetting efficiency was observed regardless of whether simultaneously encoded to-be-remembered items were present or absent. Collectively, these results demonstrate that individuals are capable of successfully removing information from working memory following directed forgetting instructions, resulting in weaker memory representations and diminished memory interference, and that this intentional forgetting requires attention-demanding executive resources that can be disrupted by secondary tasks. Converging neuroimaging evidence supporting active removal/inhibition will be highlighted.

TALK 3: DISENTANGLING COGNITIVE AND NEURAL MECHANISMS OF INTENTIONAL FORGETTING IN LONG-TERM MEMORY

Lili Sahakyan, University of Illinois at Urbana-Champaign

The focus on this talk will be the cognitive and neural mechanisms that are engaged when trying to get rid of unwanted memories in long-term memory. The presented studies use the list-method and item-method variants of directed forgetting procedure, which demonstrate that we have a remarkable ability to intentionally forget unwanted information. The critical question is how we do it. Our studies indicate that we engage in different strategies to accomplish intentional forgetting, including mental replacement of the to-be-forgotten information via thought substitution or via direct suppression of encoding. I will present new evidence from EEG studies indicating that these strategies rely

on different neural mechanisms; namely, encoding suppression induces pre-frontally mediated inhibition, whereas thought substitution is accomplished through a contextual shift/unbinding mechanism. In addition, using a cross-task design, we related the stop-signal task to a variant of directed forgetting task, which involved not only "forget" cues but also "thought-substitution" cues. The results showed that performance in the stop-signal task was correlated with magnitude of encoding suppression via forget cues, but not thought substitution cues. To address the long-term implications of different forgetting strategies, I will present a study of delayed testing across multiple time points comparing the forget cues and thought-substitution cues. Finally, I will present evidence from fMRI and eye-tracking studies indicating the involvement of both inhibitory suppression and contextual shift/unbinding mechanisms, which are engaged in intentional forgetting in long-term memory. Collectively, these studies underscore that intentional forgetting is complex and has multiple neural and cognitive mechanisms.

TALK 4: ACTIVE FORGETTING OF UNWANTED MEMORIES VIA GLOBAL HIPPOCAMPAL SUPPRESSION

Michael Anderson, Cambridge University

Being able to remember the past is a good thing, except when the past is unwelcome. When reminded of unpleasant events, people often seek to exclude the unwanted memory from awareness by stopping episodic memory retrieval. A large body of work indicates that intentionally suppressing episodic retrieval reduces hippocampal activity via control mechanisms mediated by the lateral prefrontal cortex and leads to the forgetting of the suppressed events. Here I present evidence that when people suppress retrieval given a reminder of an unwanted memory, they are far more likely to forget unrelated "bystander" experiences from periods of time surrounding retrieval suppression; in essence, retrieval suppression induces an "amnesic shadow" for nearby memories. This amnesic shadow follows a dose-response function, becomes more pronounced after practice suppressing retrieval, exhibits characteristics indicating disturbed hippocampal function, and is predicted by reduced hippocampal activity. Strikingly, any memory activated near in time to retrieval suppression—irrespective of whether people are aware of its reactivation—becomes vulnerable to disruption by the amnesic shadow. Retrieval suppression reduces hippocampal activity via GABAergic inhibition, broadly compromising hippocampal encoding, consolidation, and retrieval processes. Taken together, these findings indicate that people can disrupt unwelcome memories, and that is ability is accomplished by inhibitory control processes that interrupt hippocampal function, mimicking organic amnesia. These dynamics may contribute to significant memory deficits that often arise in the aftermath of trauma.

Symposium Session 3

THE DATA SCIENCE FUTURE OF COGNITIVE NEUROSCIENCE

Sunday, March 26, 2023, 1:30 PM - 3:30 PM (PT), Seacliff Room

Chair: Bradley Voytek, UC San Diego

Speakers: Justine Hansen, Ellie Beam, Michael Hawrylycz, Cory Inman

Cognitive neuroscience is rapidly changing, increasingly moving towards ever larger and more diverse datasets analyzed using increasingly sophisticated methods. There is a strong need for cognitive neuroscientists who can think deeply about problems that incorporate information from a wide array of domains including psychology and behavior, cognitive science, genomics, pharmacology and chemistry, biophysics, statistics, and AI/ML. With its focus on combining many large, multidimensional, heterogeneous datasets, data science provides a framework for achieving this goal. Determining what data one needs, and how to effectively combine datasets, is a daunting process. For example, a neural data scientist might be tasked with combining demographic information and multiple cognitive and behavioral measures from individuals. From those same people we might also collect biometric information, motion capture, and/or eye-tracking data. We might also collect structural and functional brain imaging data. We must then contextualize our results within the broader neuroscientific literature (>3,000,000 papers), as well as understand how our neuroimaging results relate to other domains such as human brain gene expression patterns, electrophysiology, and so on. All the above data types are very different: continuous and ordinal, time-series, video and images, graphs, spatial, high-dimensional categorical / nominal, and unstructured natural language. In this Symposium we will discuss approaches to multimodal, heterogeneous data integration. We will focus on appropriate methods for aggregating and synthesizing heterogenous cognitive neuroscience data, as well as how to leverage large, open datasets to better contextualize results within the larger neuroscientific framework.

TALK 1: NEUROMAPS: STRUCTURAL AND FUNCTIONAL INTERPRETATION OF BRAIN MAPS

Justine Hansen, McGill University

The development of advanced neuroimaging techniques has made it possible to annotate the brain in increasingly rich detail. In parallel, the open science movement has given researchers from diverse disciplines access to an unprecedented number of human brain maps. Integrating multimodal, multiscale human brain maps is necessary for broadening our understanding of brain structure and function. However, data are often shared in disparate coordinate systems, precluding systematic and accurate comparisons. Furthermore, no data sharing platforms integrate standardized analytic workflows. Here we introduce neuromaps, an open-access Python software toolbox for

contextualizing human brain maps. Neuromaps currently features over 40 curated brain maps, including genomic, neuroreceptor, microstructural, electrophysiological, developmental, and functional ontologies. The toolbox implements functionalities for generating high-quality transformations between four standard neuroimaging coordinate systems (MNI152, fsaverage, fsLR, CIVET), and can parcellate vertex- and voxel-level data according to a specified brain atlas. Robust quantitative assessment of map-to-map similarity is enabled via a suite of spatial autocorrelation-preserving null models, including permutation-based and generative models. Neuromaps combines open-access data with transparent functionality for standardizing and comparing brain maps, providing a systematic workflow for comprehensive structural and functional annotation enrichment analysis of the human brain. Collectively, neuromaps represents a step towards creating systematized knowledge and rapid algorithmic decoding of the multimodal multiscale architecture of the brain.

TALK 2: DATA-DRIVEN MAPPING AND VALIDATION OF A FRAMEWORK FOR HUMAN BRAIN FUNCTION

Ellie Beam, Stanford University

The neuroscience community has yet to propose a consensus framework for brain function that that meets the quality standards required for applications in mental healthcare. In this talk, I describe a neuroinformatics approach to engineering and validating candidate frameworks for brain function. A data-driven framework for domains of brain function was derived by synthesizing the texts and brain coordinate data of nearly 20,000 human neuroimaging articles. The resulting domains characterize several novel brain circuits that are absent from the conceptually dominant expert-determined frameworks in neuroscience and psychiatry. The data-driven framework was validated through three quantitative measures for organizational principles, in many cases outperforming models for the expert-determined frameworks. The data-driven domains are shown to be reproducible, meaning that their structure-function links replicate in held-out articles. Second, they are modular, partitioning the literature into subfields which are internally consistent and distinct from one another. Third, they are generalizable, comprised of brain structures and functions on the domain level that are similar to those reported on the level of single articles. Taken together, the data-driven framework offers a comprehensive and validated characterization of human brain function seen through the lens of functional neuroimaging. This neuroinformatics approach may be extended in future work to synthesize and compare knowledge across neuroscience subfields.

TALK 3: THE BRAIN INITIATIVE CELL CENSUS AND CELL ATLAS NETWORKS

Michael Hawrylycz, Allen Institute for Brain Science

The BRAIN Initiative Cell Census Network (BICCN) is an integrated network of centers and laboratories, data archives, and Brain Cell Data Center (BCDC, www.biccn.org) with the goal of systematic multimodal brain cell type profiling and characterization in mouse and human. The BICCN data ecosystem provides extensive data, tools, and resources for the analysis of cell types and circuits. We overview this environment and the illustrate use of the BICCN resources for accessing data and tools, illustrating the value of these data for cognitive neuroscience. Studies of homology mapping of cell types across mouse and human, have led to the formation of a new consortium, the BRAIN Initiative Cell Atlas Network (BICAN) in which this work is now being extended to human and non-human primate. The combined BICCN/BICAN infrastructure and tools provides an important resource for the exploration and analysis of cell types in the brain with important implications for research in cognitive neuroscience.

TALK 4: COGNÈURO GO: CAPTURING SYNCHRONIZED NEURAL AND EXPERIENTIAL DATA IN THE WILD

Cory Inman, University of Utah

The ultimate goal of neuroscience is to explain real-world behavior in terms of the activities of the brain and to translate these discoveries into therapeutic approaches that can help those suffering from neural disorders. Our ability to understand and treat neurological disorders depends on our knowledge of how the human brain operates, not only in controlled laboratory experiments, but also in experiments that capture the complexity, scale, and functional characteristics of real-world behaviors. Reaching these goals requires an expansion of current cognitive neuroscience paradigms to study naturalistic behaviors synchronized with neural recordings and close collaboration with computer and neural data scientists to best understand these multimodal datasets. The explosion of commercially available wearable sensors, the rapid development of smart phone and extended reality technology, and the advent of implanted neural recording technologies provide exciting new opportunities for doing human neuroscience in the wild. Critically, given the unique opportunities afforded by these developments, new naturalistic paradigms must be considered, and some theoretical questions might be best served by considering whether laboratory experiments have fully captured the essential characteristics of real-world behaviors. As an example, I'll discuss our recent work in which patients with implanted neural recording systems (i.e., NeuroPace RNS) completed a navigation and episodic memory task around a college campus while medial temporal lobe (MTL) activity was recorded and synchronized with a variety of wearable sensors (video cameras, eye tracking, motion tracking, GPS, autonomic physiology, etc.) to examine how

human MTL activity is modulated by real-world environmental contexts and experiences.

Symposium Session 4

BEYOND THE BRAIN: TRACKING MIND AND BRAIN THROUGH THE PERIPHERY

Sunday, March 26, 2023, 1:30 PM - 3:30 PM (PT), Grand Ballroom B/C

Chair: Freek van Ede, Vrije Universiteit Amsterdam

Speakers: Giacomo Novembre, Shlomit Yuval Greenberg, Benjamin O. Rangel, Baiwei Liu

Cognitive neuroscience has naturally studied the cognitive brain by looking inward, into the brain itself. Yet, as the brain is fundamentally intertwined with the body, the periphery itself can provide valuable complementary sources of evidence. In this symposium, we bring together multiple recent demonstrations of peripheral "fingerprints of mind" that have opened new windows into our understanding of mind and brain. We illustrate the power of the general approach of looking "beyond the brain" across domains ranging from perception and action, to timing, inhibitory control, attention, and memory â?? thereby speaking to the diverse interests of the cognitive neuroscience community. We bring together telling examples from saliency processing (Novembre), temporal anticipation (Yuval-Greenberg), cognitive action control (Wessel), and internally directed attention (van Ede). We show how both peripheral inactivity (in bodily and oculomotor "freezing responses") as well as overt activity (in force-output responses and spatial microsaccade biases) can uncover new insights that inform cognitive neuroscience theory and implicate involvement of specific neural circuits and computations. Looking beyond the specific insights themselves, the symposium collectively aims to raise awareness for the utilisation of peripheral fingerprints as a currently largely unseized opportunity that uniquely complements traditional brain-imaging approaches.

TALK 1: SENSORY SALIENCY AT THE TIP OF YOUR FINGERS: EVIDENCE FROM ISOMETRIC FORCE RECORDINGS

Giacomo Novembre, Italian Institute of Technology

Survival in a fast-changing environment requires animals not only to detect unexpected sensory events, but also to react. Such salient events, regardless of their sensory modality, evoke a large electrical brain response, dominated by a widespread negative-positive potential (N-P complex). I will first show that a pattern similar to the N-P complex can also be observed by recording isometric force output, simply measured by asking participants to exert force while holding a transducer with two fingers. Next, combining non-invasive (electroencephalography) and invasive (local field potentials) electrophysiological measures with simultaneous force recordings, I will show how (i) central and peripheral responses to salient events are strongly coupled, and that this coupling is (ii) mediated by cortical motor regions, (iii) well preserved across primate evolution and (iv) not reflexive but adaptive, i.e. sensitive to contextual changes in the environment. Finally, I will propose a putative neural network that might explain these findings and even reconcile them with others presented from other speakers of the symposium. These results reconceptualize the significance of the N-P complex, suggesting that we should look at it as a correlate of a reactive process rather than a merely perceptual one, preparing an individual for subsequent appropriate behavior. More broadly, these findings demonstrate that changes in isometric force – notably measured from the peripheral nervous system – can be a window into the neural network responsible for detecting salient environmental events.

TALK 2: EYE MOVEMENTS AS A WINDOW ON TEMPORAL EXPECTATIONS

Shlomit Yuval-Greenberg, Tel Aviv University

Temporal expectations, the ability to anticipate the timings of events based on temporal regularities of the environment, is typically assessed by measuring brain responses or collecting behavioral measurements such as reaction time (RT) and accuracy-rate. But brain markers require extensive preprocessing and are often difficult to interpret, and RTs and accuracy-rates are measured only after expectations have already been formed and therefore provide only a retrospective estimate. In contrast, eye movements are a continuous behavior which can provide reliable and interpretable information on fluctuations of cognitive states across time, and specifically those that are related to temporal expectation. In a series of studies, we have shown that eye movements constitute a window on temporal expectation processes. First, we showed that eye movements are inhibited prior to anticipated visual targets. This effect was found for targets that were anticipated either because they were embedded in a rhythmic stream of stimulation or because they were preceded by an informative temporal cue. Second, we showed that this effect is not specific to the visual modality but is present also for temporal orienting in the auditory modality. Last, we rule out alternative explanations and show that this effect is directly linked to the estimation of temporal expectations. We conclude that pre-target inhibition of eye movements is a reliable correlate of temporal expectations of various types and modalities. More generally, these findings suggest that eye movements are a powerful tool for understanding internal cognitive processes including temporal expectations.

TALK 3: PERIPHERAL MOTOR MEASURES AS A WINDOW INTO THE FRONTO-SUBTHALAMIC INHIBITORY CONTROL CIRCUIT

Benjamin O. Rangel, University of Iowa

Inhibitory control is one of the primary executive functions the human brain uses to overcome habitual responses and implement goal-directed behavior. Changes in cortico-spinal excitability (CSE)

measured via EMG at peripheral muscles and transcranial magnetic stimulation (TMS) offer a direct physiological measurement of the effects of the brain's inhibitory control circuitry. When an action is stopped, CSE of the underlying muscles is suppressed. Notably, however, the effects of inhibition on the cortico-motor system are even broader, as task-unrelated muscles also show suppressed CSE during stopping. Neuroanatomic theories have suggested that this is due to the involvement of the subcortical subthalamic nucleus (STN), which is broadly connected to the output nuclei of the basal ganglia that ultimately inhibit the motor system. In this talk, I will present recently published work (Wessel et al., Current Biology, 2022) in which we measured CSE in patients with implanted STN deep-brain stimulators (DBS). DBS allows a causal manipulation of STN. When STN was disrupted via DBS, non-selective CSE suppression was no longer observed. This provides first causal evidence for the involvement of STN in CSE suppression during stopping. In the second part of the talk, I will present new work from peripheral isometric force recordings, which provide a novel method of quantifying the non-selective effects of action-stopping. Force recordings address many of the known shortcomings of the TMS-based CSE method. Together, this work will show how measurements of physiological changes of the peripheral motor system can be used to interrogate the subcortical cognitive control circuitry.

TALK 4: MICROSACCADES AS A WINDOW INTO THE ROLE OF THE BRAIN'S OCULOMOTOR SYSTEM IN INTERNAL SELECTIVE ATTENTION

Baiwei Liu, Vrije Universiteit Amsterdam

Recent studies from our lab have uncovered how internally directed selective attention is associated with directional biases in small eye movements known as microsaccades – extending the role of the brain's oculomotor system to internal orienting of visual attention. In my talk, I will start by highlighting this finding. I will then go on to show how we have started to utilise directional biases in microsaccades to track attentional coding inside the brain's oculomotor system. Finally, I will discuss the relation between microsaccades and neural modulations by internal selective attention, showing how attentional modulations in microsaccades are correlated with, but not necessary for, neural modulations by covert attention. This will highlight the utility of microsaccades as a non-invasive read out of the brain's oculomotor system and its contribution to internal shifts of attention.

Symposium Session 5

CAN'T STOP WON'T STOP: STATISTICAL LEARNING PERSISTS THROUGH DEVELOPMENT, BRAIN DAMAGE AND COMPETING DEMANDS.

Monday, March 27, 2023, 10:00 AM - 12:00 PM (PT), Grand Ballroom B/C

Chair: Laura Batterink, University of Western Ontario

Speakers: Zhenghan Qi, Amy Finn, Laura Batterink, Brynn Sherman

Regularities are ubiquitous in the environment. As we navigate our daily lives, we repeatedly encounter similar clusters of items, from the arrangement of objects in a room to co-occurring syllables in spoken language. We humans are capable of automatically extracting these regularities simply through passive exposure to input, a remarkable ability known as statistical learning. Statistical learning is involved in virtually all domains of cognition, but despite its importance as a cognitive construct, we still lack a clear understanding of how the brain learns patterns from incoming input, how learning mechanisms change with brain development, and how statistical learning differs from other forms of learning and memory. In this symposium, we discuss recent progress in understanding the neurocognitive mechanisms supporting statistical learning. Across the four presentations, we cover a number of central questions: (1) how ongoing brain development impacts and interacts with what is learned via statistical learning; (2) the degree to which statistical learning across different domains recruits domain-general versus domain-specific mechanisms; (3) whether the hippocampus plays a necessary role in statistical learning, and (4) how statistical learning diverges from -- and may sometimes compete with -- other long-term memory functions such as episodic encoding. Taken together, our findings demonstrate that statistical learning continues to operate in the face of developmental changes, hippocampal damage, and competing memory demands. We speculate that the strikingly diverse and widespread brain regions involved in statistical learning may contribute to the powerful and robust nature of this learning mechanism.

TALK 1: THE NEUROBIOLOGY OF AUDITORY STATISTICAL LEARNING IS MORE DOMAIN-SPECIFIC EARLY IN LIFE

Zhenghan Qi, Northeastern University

Decades of behavioral research have demonstrated robust statistical learning (SL) abilities in the auditory domain across development. However, whether similar or different neurobiological learning mechanisms underlie SL in children and adults remains unclear. Using a triplet-pattern learning paradigm, we previously reported that although children and adults show similar performance in offline triplet recognition, children show faster learning during the exposure phase (Authors, 2022). In the current study, we compared the engagement of the domain-specific language networks and the domain-general

attention network during SL of speech syllable patterns and monotone patterns. In 27 adults (mean age = 21.0) and 25 children (mean age = 8.6), we found that language networks, defined functionally for each participant, were sensitive to the embedded patterns in the speech syllable sequence, but to a greater degree in children than in adults. As expected, language networks were not sensitive to tone SL in either group. Adults' dorsal attention networks showed sensitivity to embedded patterns in both syllable and tone sequences, while children's dorsal attention networks showed sensitivity only to patterns in tone sequences. However, interestingly, for syllable SL, greater activation in the attention network is associated with greater activation in the language network in children. In contrast, such a relationship does not exist for adults. These results suggest that children's developing language networks in the brain are still shaped by incoming language inputs, while adults' short-term plasticity is reflected more as a changing mental state with flexible allocation of domain-general attentional resources.

TALK 2: THE DEVELOPING BRAIN REPRESENTS SPECIFIC AND GROUP LEVEL REGULARITIES DIFFERENTLY

Amy Finn, University of Toronto

Recent work shows that even though children and adults show robust statistical learning, they do not form the same memories of their repeated experiences: adults remember both general and specific aspects while children remember just the specific. To understand how these memory differences are related to ongoing neural development, we had 9-10-year-old children and adults complete a visual statistical learning task during fMRI. In response to structured versus random sequences, adults engaged middle frontal regions more than children, while children activated posterior hippocampus more than adults. These differences reveal shifts in the neurobiology of statistical learning that are consistent with the ongoing progression of brain development, both cortically and within the hippocampus. Critically, we additionally examined the representational structure of statistical memories, and found that while adults represented general group information in the vmPFC—consistent with where one might expect more schematic or general memories to be stored—children represented this information in the earlier developing IFG and posterior hippocampus. In the posterior hippocampus only, children showed a unique signature of general group knowledge in which items in the same statistical groups came to be represented as less similar following learning, rather than more. Together these data reveal age-related differences in the representation of general information after statistical learning, and suggest that these differences are biologically based. While the adult neurobiology underlying statistical learning may not be fully available to children, learning persists elsewhere in the brain, with consequences for how that same information is represented.

TALK 3: STATISTICAL LEARNING DOES NOT REQUIRE THE DENTATE GYRUS

Laura Batterink, Western University

Statistical learning refers to the gradual process of extracting regularities across experiences. In contrast, pattern separation refers to the creation of distinct, separate representations of similar experiences, allowing us to distinguish events with overlapping features. Although statistical learning and pattern separation have seemingly opposing goals, both have been linked to hippocampal processing. To account for this puzzle, it has been proposed that there may be functional differentiation within the hippocampus, such that the trisynaptic pathway (entorhinal cortex > dentate gyrus > CA3 > CA1) supports pattern separation, whereas the monosynaptic pathway (entorhinal cortex > CA1) supports statistical learning. To test this hypothesis, we investigated the behavioral expression of these two processes in patient BL, an individual with highly selective bilateral lesions in the dentate gyrus that presumably disrupt the trisynaptic pathway. We obtained multiple behavioural assessments of pattern separation as well as tests to assess both implicit and explicit expressions of statistical learning. As expected based on prior work, patient BL showed significant deficits in pattern separation, as well as on an explicit, rating-based measure of statistical learning. Critically, and in contrast, BL showed intact statistical learning on an implicit measure as well as a familiarity-based recognition measure of statistical learning. Together, these results suggest that dentate gyrus integrity is critical for high-precision discrimination of similar inputs, but not the implicit expression of statistical regularities in behaviour. Our findings offer unique novel support for the view that pattern separation and statistical learning rely on distinct neural mechanisms within the hippocampus.

TALK 4: LEARNING FROM ABSTRACT REGULARITIES IN THE HIPPOCAMPUS AND VISUAL CORTEX

Brynn Sherman, University of Pennsylvania

The human brain is highly sensitive to structure. We rapidly extract spatial and temporal regularities via statistical learning and exploit learned regularities to make predictions about upcoming experiences. However, our experiences are not fully regular; the stable aspects of experience (e.g., sequences of landmarks on a daily commute) co-exist with idiosyncrasies (e.g., variable traffic patterns across days). Thus, our experiences enable two competing memory representations: statistical learning of abstract structure and episodic encoding of specific idiosyncrasies. To understand how the brain arbitrates between these two competing processes, we tested how participants simultaneously learn both episodic information and abstract (category-level) regularities. Using behavior and fMRI, we found competition between statistical learning and episodic memory, whereby predictions from statistical learning interfered with episodic encoding, a trade-off that may arise within the hippocampus. Using

intracranial EEG, we replicated and strengthened evidence for this trade-off by measuring predictive evidence in visual cortex in a time-resolved manner. These findings suggest that learned regularities can influence episodic encoding, but raise questions of how we abstract over episodes to learn higher-order regularities in the first place. In a second intracranial EEG study, we employed neural entrainment to measure learning and found that visual cortex rapidly entrained to both low- and high-level structure, suggesting that the brain rapidly generalizes across episodes to uncover reliable, abstract structure. Together, these data shed light on how we learn across experiences to form statistical models, and how those models in turn regulate the encoding of new experiences into memory.

Symposium Session 6

NEUROCOMPUTATIONAL ACCOUNTS OF AGENCY

Monday, March 27, 2023, 10:00 AM - 12:00 PM (PT), Seacliff Room

Chair: Ivan Grahek, Brown University

Speakers: Hayley Dorfman, Ivan Grahek, Mimi Liljeholm, Daniel Polani

Humans and artificial agents act adaptively by choosing actions which reliably lead to desired outcomes. Reinforcement learning provides a framework for understanding how outcome value is learned and maximized to guide behavior. However, mounting evidence suggests that humans also aim to maximize the amount of control they can exert over their environment. Going beyond pure value maximization, here we consider the role of agency in goal-directed behavior of humans and artificial agents. In this symposium we will present work on the neurocomputational bases of controllability representations in the human brain, and relate those mechanisms to recent progress in artificial intelligence research. The first three talks will provide a mechanistic perspective on controllability learning, and demonstrate that beliefs about controllability guide what actions humans take and how much effort they exert. The last talk will connect this work to research in computer science, to show that artificial agents that maximize not only expected reward, but also the amount of control they can exert over their environment, exert rich and intuitive behavior, including in interactions with humans. By combining neural data (fMRI & EEG), reinforcement learning, Bayesian inference, and information theory, the studies presented in this symposium provide a path toward a mechanistic account of controllability and agency. The integration of findings from cognitive neuroscience and computer science enhances our understanding of how agency drives goal-directed behavior, and provides an avenue for developing intrinsically motivated autonomous artificial agents.

TALK 1: NEUROCOMPUTATIONAL MECHANISMS OF AGENCY-MODULATED REWARD LEARNING

Hayley Dorfman, Harvard University

It is not always possible to know for certain whether our actions caused an outcome. Instead, we must infer how much control we have in any given environment. These inferences about control can influence the extent to which we learn from outcomes. When outcomes are attributed to our own actions, are we more likely to update our subsequent behavior? I will first present a behavioral study demonstrating that the extent to which individuals learn from positive relative to negative outcomes can be directly modulated by beliefs about control. This behavior is best explained by a Bayesian reinforcement learning model that can account for causal inference. These results suggest that asymmetric patterns of learning for positive and negative outcomes can be explained by individual differences in causal inference. I will also present a fMRI study investigating the neural mechanisms underlying how beliefs about control integrate with learning signals. These results show that enhanced activation in frontotemporal regions is associated with increased beliefs about control, suggesting that these regions represent self-related processes. We also show that prediction errors that are modulated by control beliefs are represented in the dorsal striatum, while prediction errors that are not modulated by these beliefs are represented in the ventral striatum. These findings suggest a functional dissociation between learning signals that are computed separately in distinct striatal subregions. We also show that control beliefs enhance effective connectivity from frontotemporal regions to the dorsal striatum, providing evidence for a neural mechanism that integrates control beliefs with learning signals.

TALK 2: NEURAL DYNAMICS UNDERLYING UPDATING AND ADAPTATION TO CHANGES IN PERFORMANCE EFFICACY

Ivan Grahek, Brown University

To determine how much cognitive effort to invest in a task, people need to consider whether exerting control matters for obtaining potential rewards. In particular, they need to account for the efficacy of their performance – the degree to which potential rewards are determined by their performance or by independent factors (e.g., random chance). Yet it remains unclear how people learn about their performance efficacy in a given environment. In this talk I will present a series of studies which combine computational modeling with measures of task performance and EEG, to provide a mechanistic account of how people learn and dynamically update efficacy expectations in a changing environment, and how they use these expectations to proactively adjust control allocation. In this series of studies subjects performed incentivized cognitive control tasks while their performance efficacy (the likelihood that rewards are determined by performance or at random) varied over time. We show that people learn efficacy estimates through a neural mechanism similar to the one

used to learn from rewards, and that they use this information to adjust how much control they allocate. Using a computational model, we show that these cognitive control adjustments reflect changes in information processing, rather than the speed-accuracy tradeoff. These findings demonstrate the neurocomputational mechanism through which people learn how worthwhile their cognitive efforts are.

TALK 3: CONTROLLABILITY AND GOAL-DIRECTEDNESS

Mimi Liljeholm, University of California, Irvine

Theories of instrumental behavior distinguish between goal-directed decisions, motivated by a deliberate consideration of the probability and current utility of their consequences, and habits, which are rigidly and automatically elicited by the stimulus environment based on reinforcement history. Generally, while computationally expensive, a goal-directed strategy offers greater levels of flexible instrumental control. A critical aspect of flexible choice, however, is that alternative actions yield distinct consequences: Only then does discrimination and selection between actions allow an agent to flexibly obtain the currently most desired outcome, warranting the processing cost of goal-directed computations. One possibility, therefore, is that a goal-directed decision strategy is deployed when contingencies afford high levels of flexible instrumental control. Moreover, since subjective outcome utilities often change from one moment to the next, flexible instrumental control is essential for reward maximization and, as such, may serve to reinforce and motivate decisions that guide the organism toward high-agency environments. I will present a series of behavioral and fMRI experiments demonstrating that sensitivity to outcome devaluation - a defining feature of goal-directed choice - is greater in environments in which available action alternatives yield distinct outcomes, that participants prefer to make decisions in such high-agency environments, and that these effects are predicted by neural activity in the right supramarginal gyrus. Implications for the optimization of artificial autonomous agents will be discussed.

TALK 4: INTER-AGENT EMPOWERMENT AS SOCIAL INCENTIVE AND THE THREE LAWS OF ROBOTICS

Daniel Polani, University of Hertfordshire

Living beings are distinct from artificial agents in that they need to continuously operate in largely unexplored, novel state spaces. They do not have the opportunity to train extensively in controlled, reproducible, and safe environments. The more, it is crucial that they can make effective decisions and take actions quickly, effectively, even if not always strictly optimally. Niche-specific drives and incentives may cover certain aspects of an organism's requirements, but it is implausible that these would be comprehensive. It has thus been hypothesized that organisms instead employ "intrinsic motivations", generic drives which are determined only by their sensorimotor contingency to determine saliency and direct their behaviour in novel situations when immediate concrete tasks which would trigger goal-directed action have not yet crystallized. In this talk I will present the work on one such intrinsic motivation – empowerment. This is an information-theoretic generalization of controllability/observability of the action-perception loop, and it measures how much detectable changes (measured in bits) the agent can inject in the environment via the actions she takes. I will present a series of simulation and experimental studies across a variety of agent scenarios which demonstrate that in multiagent scenarios involving humans, which include human-agent companions, assistance, and interaction relations, empowerment as an incentive mediates behaviours which are surprisingly interpretable in intuitive terms, including operational surrogates for the Three Laws of Robotics.

Symposium Session 7

EVENTS AND THEIR BOUNDARIES: A DEVELOPMENTAL PERSPECTIVE

Monday, March 27, 2023, 10:00 AM - 12:00 PM (PT), Bayview Room

Chair: Susan Benear, New York University

Speakers: Susan Benear, Andrei Amatuni, Erika Wharton-Shukster, Sang Ah Lee

The ability to organize a lifetime of episodic memories into a coherent structure relies heavily on grouping our ongoing experience into events separated by boundaries. Adults' brains show evidence of boundaries between perceived events that align well with behaviorally defined boundaries, which in turn relates to their memory for events. Understanding how event cognition changes across development can provide insight into how events shape perception and memory. In this symposium, we will begin with an investigation into how young children and adults parse and remember events, showing that children who demarcate boundaries similarly to adults have better event memory, and that behavioral boundaries are represented neurally in young children. Next, we will discuss work examining the aspects of events that lead children versus adults to define a boundary, showing that children tend to mark boundaries at semantic shifts, while adults focus on perceptual changes. After this, we will shift to a study evaluating how young children and adults use spatial boundaries to structure their memory, demonstrating that children's perception of boundaries grows more abstract with development, and that spatial boundaries are represented in the brain and support associative memory in adults. Finally, we will move beyond event boundaries to cover the way children and adolescents' brains represent full event models, revealing that neural response patterns across events in children are similar to those of adults and suggesting that children's memories are likely shaped by events like adults' are.

TALK 1: SETTING BOUNDARIES: DEVELOPMENT OF NEURAL AND BEHAVIORAL EVENT COGNITION IN EARLY CHILDHOOD

Susan Benear, New York University

The ongoing stream of sensory experience is so complex and ever-changing that we tend to parse this experience at "event boundaries", which structures and strengthens memory. Memory processes undergo profound change across early childhood. Whether young children also divide their ongoing processing along event boundaries, and if those boundaries relate to memory, could provide important insight into the development of memory systems. In Study 1, 4-7-year-old children and adults segmented a cartoon, and we tested their memory. Children's event boundaries were more variable than adults' and differed in location and consistency of agreement. Older children's event segmentation was more adult-like than younger children's, and children who segmented events more like adults had better memory for those events. In Study 2, we asked whether these developmental differences in event segmentation had their roots in distinct neural representations. A separate group of 4-8-year-old children watched the same cartoon while undergoing an fMRI scan. In the right hippocampus, greater pattern dissimilarity across event boundaries compared to within events was evident for both child and adult behavioral boundaries, suggesting children and adults share similar event cognition. However, the boundaries identified by a data-driven Hidden Markov Model found that a different brain region—the left and right angular gyri—aligned only with event boundaries defined by children. Overall, these data suggest that children's event cognition is reasonably well-developed by age 4 but continues to become more adult-like across early childhood.

TALK 2: LINKING PERCEPTUAL AND SEMANTIC PREDICTABILITY TO PATTERNS OF EVENT SEGMENTATION IN DEVELOPMENT

Andrei Amatuni, University of Texas

Children identify different transitions between events, i.e. event boundaries, relative to adults. Here, we test whether developmental differences in event segmentation arise from how participants experience uncertainty when viewing naturalistic video narratives. It's suggested that neural systems supporting event segmentation in adults do so by monitoring changes in event content, wherein perceptual or semantic changes trigger uncertainty, leading to boundary formation within continuous experience. Here, we use deep neural nets to quantify the predictability of individual movie frames based on preceding frames, using two different models to independently quantify prediction based on perceptual and semantic content. We modeled the perceptual and semantic uncertainty on a moment-by-moment basis and related these computationally-derived measures of uncertainty to participants' subjective experiences of event boundaries, testing whether age-related differences in event segmentation stem from greater sensitivity to predictive properties of the input. Children (5-12 years old) and adults (N=74) watched five naturalistic movies and pressed a button whenever they perceived an event boundary. Children were less likely to experience event boundaries at perceptually unpredictable moments than adults ($p < 0.05$), while event boundaries tracking semantic uncertainty decreased with age ($p < 0.05$). In particular, we find that adults' estimates of event boundaries minimize semantic belief updating ($p < 0.01$), consistent with the idea that adults use pre-existing semantic knowledge when encoding novel narrative events. Collectively, these findings indicate that developmental differences in event segmentation arise from how children and adults use perceptual and semantic content to derive expectations during novel event encoding.

TALK 3: SPATIAL BOUNDARIES AND THE DEVELOPMENT OF EPISODIC MEMORY STRUCTURE

Sang Ah Lee, Seoul National University

Research has shown that navigation and episodic memory are intimately related and supported by the hippocampus. We suggest that the spatial structures that guide navigation are the same ones that influence the organization of episodic memory. In one study, we found that temporal sequencing of memory was facilitated by spatial information in 3-6-year-old children, and the ability to accurately remember the order of events that crossed a spatial boundary developed later than those on the same side of the boundary. Furthermore, we found that a 3D wall-like boundary facilitated event sequence memory in 3-year-olds, while 2D lines and a row of objects exerted an influence from about 5 or 6 years of age, demonstrating that children's representation of boundaries becomes more abstract over development. To gain insight into the neural correlates of boundary-based event memory structure, adult participants performed a conceptually similar, computer-based episodic memory task in the fMRI scanner. We found that boundary-induced memory facilitation (compared to the no-boundary control condition) was not simply due to an improvement in spatial sequence memory but an improvement in episodic binding (e.g., object-space association). Moreover, individual differences in boundary facilitation were reflected in the degree of activation of the hippocampus and scene-selective cortical areas in response to the presence of the spatial boundary. Together, these results suggest the hippocampal representation of the spatial structure of the environment aids in binding the elements of memory into events and that developmental changes in spatial representations may result in changes in children's episodic memory organization.

TALK 4: BEYOND THE BOUNDARIES: EVENT MODEL MAINTENANCE ACROSS DEVELOPMENT

Erika Wharton-Shukster, University of Toronto

It is no surprise there is growing interest in children's event segmentation, as parsing experiences has such an important impact on memory (Jie et al., 2021). What is more surprising, however, has

been the focus on boundaries at the expense of the events themselves. Event representations, or "event models", employ schematic knowledge while integrating new information. This is instantiated in increased activation of brain regions like the mPFC (Ezzyat and Davachi, 2011) over the course of an event. However, with knowledge and the brain developing across childhood, might children's event maintenance change into early adulthood? Might they rely less on their limited knowledge, showing less of this ramping effect in the mPFC or other semantically relevant regions (e.g., Default mode network (DMN); Chen et al., 2016)? Alternatively, might event model maintenance remain stable across childhood despite increasing knowledge? To address these questions, we analyzed fMRI data of a sample of children and adolescents (5–19 years; n=46) as they watched a narrative movie. Using a whole-brain parametric regressor, we analyzed activation increases over the course of events (as defined by independent raters) within the whole sample and across age. As a group, we found increases in regions making up the DMN (mPFC, PCC, precuneus, angular gyrus, and MTL). Importantly, there was no difference in this ramping effect with age. Thus, although children have less experience, they may rely on and integrate it similarly to adults, suggesting that children's memory may be similarly shaped by events, even if the content differs.

Symposium Session 8

FROM OBSERVED EXPERIENCE TO CONCEPTS: MULTIPLE VIEWS ON THE MECHANISMS OF CONCEPT FORMATION IN THE HUMAN BRAIN

Monday, March 27, 2023, 10:00 AM - 12:00 PM (PT), Grand Ballroom A

Chair: Anna Leshinskaya, University of California, Davis

Speakers: Ella Striem-Amit, Morgan Barense, Anna Leshinskaya, Yanchao Bi

Concepts offer a scientific puzzle: although many concepts are learned from experience, it is notoriously difficult to reduce their meanings to sensory-motor features. This suggests that the mind richly transforms sensory experiences, but this cognitive and neural mechanism remains poorly understood. Our speakers address this problem each from a different angle, offering multiple views on the origins and nature of abstraction. Striem-Amit studies individuals who are born blind or without certain motor effectors, like hands. She demonstrates striking plasticity in some, but not other, parts of the brain's action and vision systems that allows them to adapt to these diverse experiences and thus capture a common meaning independent of sensori-motor parameters. Barense shows how the brain creates multi-modal object representations from component sensory features, finding a uniquely integrative code in the anterior temporal lobe. From this view, object concepts obtain their abstraction by multi-modal binding that creates a whole greater than the sum of its parts. Leshinskaya takes another view on the mechanisms of abstraction: the ability to encode relational structure among objects and events. She shows that by encoding stimuli in terms of their relations, neural representations of those stimuli diverge from the representations of their sensory properties, and this can align with domain specializations. Bi argues that abstraction originates from language. She shows that semantic representations in the anterior temporal lobe are weakened in human participants with language delay resulting from early deafness and late exposure to sign language. This illuminates the influence of language on concept representations.

TALK 1: INFERRING REPRESENTATIONAL ABSTRACTION FROM PLASTICITY PATTERNS IN THOSE BORN BLIND OR WITHOUT HANDS

Ella Striem-Amit, Georgetown University

How abstract are the representations of objects or actions in different parts of our brains? One way to study this question is if they are indifferent to transformations related to their low-level sensory or motor features. For example, in the sensory domain, that entails representing the same content regardless of being presented visually or auditorily; in the motor domain, representing the same action regardless of the body part performing it. However, as many concepts entail complex sensorimotor features, one aspect of the concept may elicit imagery or recall of related aspects. Studying people born without experience in one sensory or motor channel provides an additional step in verifying how tied brain representations are to their low-level features, as people born blind, for example, cannot imagine or recall visual features. We will discuss how studying these populations can be used to probe the question of abstraction across domains. In individuals born without hands, who use their feet to perform everyday actions, we find that association motor areas maintain similar preferences for actions in these individuals to those of control participants performing the actions with their hands. This suggests abstraction beyond the low-level sensorimotor features. In contrast, plasticity in primary cortices in these individuals shows different patterns of plasticity that are not invariant to sensorimotor features. Together, these findings suggest that different patterns of plasticity can be informative in understanding the hierarchy of action abstraction.

TALK 2: MULTIMODAL OBJECT REPRESENTATIONS RELY ON INTEGRATIVE CODING

Morgan Barense, University of Toronto

Combining information from multiple senses is essential to object recognition, core to the ability to learn concepts, make new inferences, and generalize across distinct entities. Yet how the mind combines sensory input into coherent multimodal representations – the multimodal binding problem – remains poorly understood. Here, we applied multi-echo fMRI across a four-day paradigm, in which participants learned 3-dimensional multimodal object representations

created from well-characterized visual shape and sound features. Our novel paradigm decoupled the learned multimodal object representations from their baseline unimodal shape and sound features, thus tracking the emergence of multimodal concepts as they were learned by healthy adults. Critically, the representation for the whole object was different from the combined representation of its individual parts, with evidence of an integrative object code in anterior temporal lobe structures. Intriguingly, the perirhinal cortex – an anterior temporal lobe structure – was by default biased towards visual shape, but this initial shape bias was attenuated with learning. Pattern similarity analyses suggest that after learning the perirhinal cortex orthogonalized combinations of visual shape and sound features, transforming overlapping feature input into distinct multimodal object representations. These results provide evidence of integrative coding in the anterior temporal lobes that is distinct from the distributed sensory features, advancing the age-old question of how the mind constructs multimodal objects from their component features.

TALK 3: RELATIONAL ENCODING DRIVES SENSORY ABSTRACTION IN LATERAL TEMPORAL CORTEX

Anna Leshinskaya, University of California, Davis

Across two studies, we investigated the influence of temporal relation learning on neural responses to novel visual events. In study 1, participants learned that event A was followed by event B but not C, resulting in a correlated neural response to A and B (vs C). Such relational knowledge is often thought to be represented in the perceptual system, but we report a divergence: areas that represented the A-B relationship were reliably dissociated from areas that represented the visual features of the same stimuli. In Study 2, we showed that event structure associated with novel objects can differentially engage domain-selective areas in the temporal lobe, controlling for shape or motor association. Objects that had been shown to move prior to an event, seeming to cause it, elicited more activity in tool-selective brain areas than objects that moved after an event (all when shown as static pictures following learning). This differential response was absent in areas selective to familiar non-tool objects. Overall, we argue that the ability to learn relations is a fundamental mechanism by which the brain builds representations that diverge from sensory-motor features and move closer to conceptual ones.

TALK 4: THE EFFECTS OF EARLY-LIFE LANGUAGE EXPERIENCE IN DERIVING NEURAL SEMANTIC REPRESENTATIONS

Yanchao Bi, Beijing Normal University

One signature of the human brain is its ability to derive knowledge from language inputs, in addition to nonlinguistic sensory channels such as vision and touch. Information derived from sensory and language inputs are often convergent and the nature of the neural representations are difficult to be disentangled. Does human language experience specifically modulate the way in which semantic knowledge is stored in the human brain? We investigated this question using a unique early-life language-deprivation human model: early deaf adults who are born to hearing parents and thus had delayed acquisition of any natural human language (speech or sign; N = 23), with early deaf adults who acquired sign language from birth as nonlinguistic, sensory experience matched controls (N = 16). Neural responses in a meaning judgment task with 90 written words that were familiar to both groups were measured using fMRI. Using representation similarity analyses, we found that the early language-deprived group, compared with the deaf control group, showed reduced semantic sensitivity, in both univariate (preference for abstract/nonobject words) and multivariate pattern (semantic structure encoding) analyses, in the left dorsal anterior temporal lobe (dATL). These results provide positive, causal evidence that the neural semantic representation in dATL is specifically supported by language, , as a unique mechanism of representing (abstract) semantic space, beyond the sensory-derived semantic representations distributed in the other cortical regions.

Symposium Session 9

IN MEMORIAM LESLIE G. UNGERLEIDER (1946-2020)

Tuesday, March 28, 2023, 1:30 PM - 3:30 PM (PT), Grand Ballroom B/C

Chair: Sabine Kastner, Princeton University

Speakers: Helen Barbas, Chris Baker, Peter De Weerd, Marlene Behrmann

The scientific community lost one of its giants, Leslie G. Ungerleider (1946-2020), who for many years was Chief of the Laboratory of Brain and Cognition at the National Institute of Mental Health and an NIH Distinguished Investigator. Leslie united, in one single remarkable scientist, multiple disciplines and the rich knowledge that comes with each. She pursued several different career paths and scientific interests in parallel: as a neuroanatomist, her work provided the bedrock for an understanding of structural connectivity within the visual system and beyond; as a neurophysiologist, her studies laid the foundation for an understanding of the visual systems' functions; and as a neuroimager, she translated her rich knowledge of the primate brain to the exploration of structure-function relationships in human cognition. Leslie was one of the founders and an immense driver of the cognitive neuroscience field. In addition to her fundamental contributions to the field of neuroscience, Leslie was an exceptional mentor and shaped the careers of numerous scientists. In this symposium, we will celebrate Leslie Ungerleider's career and life as a scientist in many ways. Trainees, collaborators and colleagues will reflect on her profound contributions to our field, her mentorship and role model to female scientists.

TALK 1: PRIMATE PARALLEL PATHWAYS IN VISUAL AREAS AND BEYOND

Helen Barbas, Boston University

Theoretical models provide a basis to unravel the organization of neural circuits from sensory to high-order processing cortices. One model with heuristic value proposed the existence of "two cortical visual systems" with distinct attributes. Bolstered by classical circuit and functional studies, Ungerleider and Mishkin (1982) proposed that one system originates in the ventral part of the primate primary cortex (V1) and extends through ventral occipital and temporal visual cortices, and has a role in object perception. The other originates in dorsal V1 and extends to dorsal occipital and parietal cortices and is specialized in processing object location. This model provided the basis for the detailed study of anatomic circuits within the visual cortical systems and the discovery of new and specialized visual areas in the primate temporal and parietal regions. These studies laid the foundation for the use of functional neuroimaging approaches in humans. Progress in the study of functional and anatomic pathways through visual sensory areas and high-order association areas showed strong influence from the amygdala, revealing the impact of emotional significance on neural processing for social cognition. The core parallel systems are reminiscent of the classical dual modes of the origin of the cortex and its systematic architectonic variation across systems. The classical and recent models have significant implications for recruitment of multiple parallel systems in neural signal processing, ranging from simple sensory attributes to complex cognition, and for the development and evolution of the cerebral cortex.

TALK 2: THE ESSENTIAL INTERACTION OF FUNCTION AND ANATOMY IN PRIMATE VISION

Chris Baker, National Institute of Mental Health

The pioneering work of Leslie Ungerleider led to the division of cortical visual processing into separate dorsal and ventral visual pathways, specialized for spatial and object processing, respectively. I will present an updated view of cortical visual processing and discuss why this framework which connects human and non-human primate studies and links anatomy, function and behavior remains a critical foundation for much of modern cognitive neuroscience. The dorsal and ventral pathways are now understood to be highly recurrent, interactive networks defined by the nature of both input and output targets. The dorsal visual pathway bridges between retinotopic cortex and structures involved in spatial working memory, visually guided action and navigation, while the ventral pathway bridges to at least six cortical and sub-cortical structures involved in long term learning and memory. A third pathway has now been proposed, extending from retinotopic cortex into the banks of the superior temporal sulcus and proposed to be specialized for social perception. Each of these three pathways shows distinct properties relating to retinotopy and motion, reflecting the underlying anatomical connectivity. The complex connectivity along these pathways challenges both the standard hierarchical view of visual processing and the parcellation of cortex into discrete modules. Given our limited knowledge of anatomical connectivity in human, these frameworks provide a critical grounding for human neuroimaging studies and a set of constraints that inform computational modeling. Ultimately, anatomy forms the scaffolding on which cortical processing develops, providing a critical window into function and its link to behavior.

TALK 3: ON THE RELEVANCE OF GAMMA OSCILLATIONS FOR FIGURE-GROUND SEGREGATION IN VISUAL TEXTURES

Peter De Weerd, Maastricht University

The relevance of gamma oscillations for perception has been a matter of debate. We addressed this question by testing whether a mathematically grounded theory of synchronization (the theory of weakly coupled oscillators, TWCO) would be able to predict human texture segregation performance and related neural synchronization data in monkey V1. In monkey V1 experiments, we recorded LFPs and action potentials from two neighboring V1 locations. The physical distance between two recording probes was manipulated to vary lateral coupling strength between the recorded neuronal populations. The local stimulus contrasts driving the recorded populations were varied to manipulate the gamma frequency difference (detuning) between the recorded neuronal populations. As predicted by TWCO, the two recorded neuronal populations synchronized within a triangular region in a detuning by coupling space (the 'Arnold tongue'). To test the relevance of our findings in monkeys for human perception, a texture was designed with circular Gabor elements. Human participants had to detect a figure defined by a random variation among Gabor element contrasts that was confined within a smaller range than in the background. Human texture segregation plotted as a function of spacing and contrast variation revealed a 'behavioral Arnold tongue' in line with predictions from TWCO. Training-induced improvements in performance could also be predicted by TWCO-inspired models fitted with a learning rule. The present work shows that a mathematically specified theory of gamma synchronization predicts interrelated neurophysiological and visual psychophysical observations. The data support a contribution of gamma oscillations to figure-ground segregation for the textures used.

TALK 4: FACE PATCHES AND CIRCUITRY IN HUMAN AND NON-HUMAN INFEROTEMPORAL CORTEX

Marlene Behrmann, University of Pittsburgh

Although the presence of face patches in primate inferotemporal (IT) cortex is well established, the functional and causal relationships among these patches remain elusive. To examine the circuitry as well as the necessary (and perhaps sufficient) neural contributions to face perception, two parallel lines of research are discussed. The first approach includes behavioral and functional MRI studies with humans

with normal or impaired face perception. The results demonstrate that, in individuals with congenital prosopagnosia (CP), connectivity to 'extended', more anterior regions such as the anterior temporal lobe is compromised structurally and functionally. The complementary second approach involves transient inactivation of face patches with concurrent functional MRI with non-human primates. As with the CP, the results revealed that anterior face patches required input from middle face patches, while the face selectivity in middle face patches arose, in part, from top-down input from anterior face patches. In both investigations, the face patches also evinced activation in response to objects, albeit to a lesser extent. These findings of the causal relationship among the face patches demonstrate that the primate IT face (and object) circuit is organized into multiple necessary feedforward and feedback pathways.

Symposium Session 10

THE BRAIN IS COMPLEX: HAVE WE BEEN STUDYING IT ALL WRONG?

Tuesday, March 28, 2023, 1:30 PM - 3:30 PM (PT), Grand Ballroom A

Chair: Brad Postle, University of Wisconsin, Madison

Speakers: Luiz Pessoa, Lucina Uddin, John Krakauer, Felipe De Brigard

The human brain is an enormous nonlinear dynamical system. Its roughly 100 billion neurons are massively, recurrently interconnected, and each of its hundreds of trillions of synapses can undergo rapid plastic change. Increasingly, scientists inside and outside the neurosciences have advocated for a radical rethinking of how we approach the study of the brain. It has been argued, for example, that much of contemporary cognitive neuroscience approaches the brain as a 'near-decomposable' system, in which interactions within functional subsystems are much stronger than interactions between them. This approach is doomed to fail if, instead, the brain is interactionally complex, with functions that are emergent from this complexity. But does acknowledgement of brain's complexity necessitate that we abandon, for example, the study of small groups of brain regions/circuits to understand the neural bases of constructs from cognitive, affective, or social psychology? Does it fundamentally challenge inferences of causality drawn from observing the behavioral effects of lesions or experimental manipulations? These and other questions are debated in a Special Focus in the Journal of Cognitive Neuroscience, to appear early in 2023, organized around a precis of Luiz Pessoa's book The Entangled Brain (2022). This symposium will feature presentations by Pessoa and authors of three of the commentaries in JoCN, followed by a moderated discussion/debate among these four plus additional contributors to the Special Focus (including S. Sadaghiani and B. Wyble). It will conclude by broadening the Q&A to the audience.

TALK 1: THE ENTANGLED BRAIN

Luiz Pessoa, University of Maryland

We need to understand the brain as a complex, entangled system. Why does the complex systems perspective, one that entails emergent properties, matter for brain science? In fact, many neuroscientists consider these ideas a distraction. I discuss three principles of brain organization that inform the question of the interactional complexity of the brain: (1) massive combinatorial anatomical connectivity; (2) highly distributed functional coordination; and (3) networks/circuits as functional units. To motivate the challenges of mapping structure and function, I will discuss neural circuits illustrating the high anatomical and functional interactional complexity typical in the brain, and will consider potential avenues for testing for network-level properties, including those relying on distributed computations across multiple regions. The complex systems perspective has important implications for brain science, including the need to characterize decentralized and heterarchical anatomical–functional organization. It also has important implications for causation, because traditional accounts of causality provide poor candidates for explanation in interactionally complex systems like the brain, given the distributed, mutual, and reciprocal nature of the interactions. Ultimately, to make progress understanding on how the brain supports complex mental functions, we need to dissolve boundaries within the brain—those suggested to be associated with perception, cognition, action, emotion, motivation—as well as outside the brain, as we bring down the walls between biology, psychology, mathematics, computer science, philosophy, and so on.

TALK 2: A PERSPECTIVE FROM NETWORK NEUROSCIENCE

Lucina Uddin, UCLA

Many agree that, because human brain function is context-dependent and interactionally complex, we should embrace brain networks as the functional units of interest. A more contentious issue for the field, however, is how to define brain networks in ways that will facilitate further discovery. Important questions that I will address include: what constitutes a brain network? what are the spatial topographies of commonly observed brain networks? how many brain networks exist? can a taxonomy of brain networks be delineated? And what naming conventions and terminology should be adopted to facilitate communication amongst scientists? Although it may be that a rose by any other name would smell as sweet, a brain network that goes by multiple names obscures potential insight into functional brain organization. Building a universal taxonomy of large-scale brain networks will help us reach the goal of making progress along the lines of understanding dynamics, decentralized computation, and emergence in the brain.

TALK 3: MODULAR BRAIN, ENTANGLED ARGUMENT

John Krakauer, Johns Hopkins University

Considerations of the brain as a complex dynamical system often raise dichotomies: reductionism vs. emergence, network vs. region, heterarchy vs. hierarchy, interactivity versus decomposability, and entangled vs. modular. When considering these, it is important to see what is really at stake conceptually. A particular problem with these dichotomies, when raised in this context, is that it can be tacitly assumed, for each binary opposition, that one of its elements is a priori better than the other. This assumption, in turn, can lead to an agenda to unseat a human-centric hierarchical view of the mind and the mental that hinges on psychological words, such as cognition, thinking, reasoning, planning, attention and emotion. I will argue that what is problematic with this progression is that it conflates the modular with the psychological. Complex systems evolved by compartmentalization and specialization – prokaryotes to eukaryotes to multicellular organisms. The brain, as an evolved complex system, is no different – cells have organelles, bodies have organs, and brains have modules and areas. The kinds of cognition at which humans excel should be thought of as new specializations, perhaps emergent, within identifiable brain areas. Although there is no doubt that interactions between brain areas are of critical importance and should be studied, they do not supplant modularity. To give networks (and sensorimotor loops) exaggerated creative powers will not advance understanding.

TALK 4: NOT EVERY THING MUST GO

Felipe De Brigard, Duke University

There is much to like in emergentist perspectives that seek to align dynamic assemblies of neurons and neural regions with psychological categories drawn from an evolutionary perspective on behavior. These perspectives emphasize that the brain is an interactionally complex system that fails to be near-decomposable. In other words, the functions of neural systems are radically context-sensitive and the networks that support behavior cannot be productively broken down into functional subcomponents. I do not believe, however, that accepting these tenets demands that we abandon traditional psychological categories, explanatory strategies that rely on functional decomposition, and even the notions of causality that support those strategies. Rather, I will argue that functional decomposition remains our best bet for building up a mesoscale theoretical understanding of the brain. Furthermore, there are costs to jettisoning traditional psychological categories that may be too steep to pay.

Symposium Session 11

ALTERED STATES OF COGNITION: THE ACUTE AND PERSISTING CONSEQUENCES OF PSYCHEDELIC DRUGS ON COGNITION

Tuesday, March 28, 2023, 1:30 PM - 3:30 PM (PT), Bayview Room

Chair: Manoj Doss, John Hopkins University

Speakers: Carli Domenico, Manoj Doss, Natasha Mason, Philip Corlette

Psychedelic research is growing rapidly, and with recent policy reforms and 'breakthrough therapy designation' from governmental bodies, they are becoming more accessible. Whereas the subjective and clinical effects of these substances have received global attention, how psychedelic drugs alter cognitive function has been largely overlooked. In light of reports that psychedelics obfuscate the sense of space and time, alter how memories are remembered, enhance creativity, and dramatically change world beliefs, here, we discuss psychedelics under the lens of cognitive neuroscience. This symposium provides an overview of the research-to-date, investigating the effects of psychedelics on 1) rodent place cell function and spatial cognition, 2) episodic memory, 3) processes relevant to creativity, and 4) belief updating. With this symposium, we will provide insight into acute and persisting (mal)adaptive alterations in cognition, a pertinent question given the parallel rise in recreational and therapeutic use. Furthermore, it will be discussed what we can learn from these alterations in cognitive function about cognition itself. Finally, whether such cognitive alterations may play a role in the immediate and persisting symptomatic relief witnessed in clinical trials will also be discussed. The symposium combines state-of-the-art multidisciplinary methodological, fundamental, theoretical, and clinical perspectives of the science of psychedelics to highlight the current state of knowledge. This symposium will bring together diverse researchers from four research laboratories around the world across different career stages. As a subject that is recently gaining traction quickly, this symposium will be the first to examine how cognitive neuroscience can shed light on psychedelic science.

TALK 1: LSD-ALTERED SPATIAL COGNITION WITH TETRODE RECORDING OF HIPPOCAMPAL PLACE CELLS

Carli Domenico, Baylor College of Medicine

Psychedelic drugs that agonize the 5-HT2A receptor like lysergic acid diethylamide (LSD) exert hallucinogenic and therapeutic effects in humans and enhance synaptic plasticity. While human research continues to accumulate in this accelerating field of interest, animal studies directly observing neuronal activity are limited despite lacking mechanistic understanding. In our lab, we recorded hippocampal CA1 place cells in rats to determine how the established spatial map alters with LSD. Place cells are considered building blocks for episodic

memory, firing in a map representing the environment and tethering to other sensory data corresponding to that context. We can observe how a familiar trajectory is activated during rat running behavior and how it is reactivated during consolidation or recall events like in sleep and immobility. Generally, place cells exhibit a tight relationship often seen in co-firing activity with visual cortical neurons coactive in the same position as their corresponding place cells, and they continue to burst together during rest. We have observed that with LSD, this relationship is altered both during rest and active movement, and we also see that place cells behave less discriminately with LSD- similar to how they behave in a less familiar, more novel environment. These changes do not occur following a control saline condition nor with LSD and a 5HT2AR antagonist given together. These findings give a direct look at how neurons in an area critically involved in episodic memory report their cognitive map in a state in which the perception of the world is altered in humans.

TALK 2: THE CURRENT STATE OF RESEARCH ON THE IMPACT OF PSYCHEDELICS ON EPISODIC MEMORY

Manoj Doss, John Hopkins University

Psychedelics (5-HT2A agonists) cause drastic changes in how memories are remembered, and disorders treated with psychedelics (e.g., depression and PTSD), exhibit abnormalities in episodic memory. With episodic memory dependent on plasticity, and psychedelics driving plasticity, psychedelics may be a useful tool for understanding the malleability of memory. Here, I will discuss how psychedelics impact encoding, consolidation, and retrieval and draw comparisons to other psychoactive drugs. While most psychoactive drugs including psychedelics impair hippocampally-dependent recollection-based encoding, psychedelics may uniquely enhance cortically-dependent familiarity-based encoding. These impairments and enhancements of Tulving's conceptions of "autonoetic" and "noetic" consciousness, respectively, coincide with how psychedelics impair one's sense of self ("ego dissolution) and drive feelings of insight ("noetic quality"). Considering the highest density of 5-HT2A receptors on layer V pyramidal neurons, psychedelics may facilitate rapid cortical learning in otherwise rigid, slow-learning semantic networks. Regarding consolidation, like GABAA sedatives and stress manipulations, post-encoding psychedelics enhance memory in both humans and animals, though it is currently unclear how this form of retrograde facilitation differs from others. Finally, whereas many drugs distort memory retrieval, it will be discussed how psychedelics may particularly drive false memories with their ability to enhance mental imagery and suggestibility. Nevertheless, such memory distortions may also be part of the therapeutic efficacy of these drugs. Together, psychedelics may be well-posited for altering maladaptive memories, though more research will be needed on directing their neuroplastogenic effects to avoid disrupting adaptive semantic networks or inducing false memories.

TALK 3: SPONTANEOUS AND DELIBERATE CREATIVE COGNITION DURING AND AFTER PSILOCYBIN EXPOSURE

Natasha L Mason, Maastricht University

Creativity is an essential cognitive ability linked to all areas of our everyday functioning. Thus, finding a way to enhance it is of broad interest. A large number of anecdotal reports suggest that the consumption of psychedelic drugs can enhance creative thinking; however, scientific evidence is lacking. Following a double-blind, placebo-controlled, parallel-group design (N=60), we demonstrated that psilocybin (0.17 mg/kg) induced a time- and construct-related differentiation of effects on creative thinking. Acutely, psilocybin increased ratings of (spontaneous) creative insights, while decreasing (deliberate) task-based creativity. Seven days after psilocybin, the number of novel ideas increased. Furthermore, we utilized an ultrahigh field multimodal brain imaging approach, and found that acute and persisting effects were predicted by within- and between-network connectivity of the default mode network. These findings suggest a nuance in the historical claims that psychedelics can influence aspects of the creative process. Namely despite reports of overall enhanced creative capacity, they seem to alter creative cognition in a construct and time-dependent manner. It will be discussed as to whether psychedelic interventions can be used as a tool to investigate creative cognition and subsequent underlying neural mechanisms, and as to whether changes in creativity may contribute to symptomatic relief witnessed in clinical trials.

TALK 4: BELIEFS, PSYCHEDELICS, AND THE BRAIN

Philip Corlette, Yale School of Medicine

It has been claimed that psychedelics induce rapid and enduring changes in beliefs about the self, others, society, and metaphysics. These effects may be related to the profundity of the acute psychedelic experience. However, the study designs and methods of belief solicitation may be flawed. Furthermore, in clinical neuroimaging studies, claims about cognitive functions like belief updating are often made with brain imaging data in the absence of a behavioral task. In this talk I will describe efforts to highlight these shortcomings (and the subsequent social media fallout), and I will adumbrate a series of studies with ketamine and belief updating that may provide a path forward. I will suggest that these data contradict the popular predictive processing model of psychedelic drug action, "Relaxed Beliefs Under Psychedelics" (REBUS) . Instead, I will offer a framework within which many more psychotomimetic interventions (including sensory deprivation) might be understood – that of precision-weighted belief updating. I hope these critiques are received in the spirit they are intended, one of cautious optimism, tempered by solid methodology and appropriate inferences.

Symposium Session 12

METHODOLOGICAL ADVANCES IN THE STUDY OF AUTOBIOGRAPHICAL MEMORY

Tuesday, March 28, 2023, 1:30 PM - 3:30 PM (PT), Seacliff Room

Chair: Roni Setton, Harvard University

Speakers: Roni Setton, Hongmi Lee, Signy Sheldon, Asieh Zadbood

Our repository of past experiences forms the fabric of who we are and how we engage with the world. Inquiry into this autobiographical form of memory often involves unique tasks that capture complex mental representations in a way that mimics real-world remembering. There is growing consensus that many brain regions support and synchronize these representations during recollection, and dynamically interact to form distributed networks. This advancement has paved the way for more sophisticated methodological and analytical techniques to probe these interactions and investigate how they reorganize across stages of recollection and across individuals. In the first talk, Roni Setton provides evidence that optimized pipelines for individual differences in functional connectivity at rest can identify discrete ensembles of brain regions that scale with variation in autobiographical recollection across the adult lifespan. Hongmi Lee then highlights how transitions, both in thought content and brain activity, can be examined to understand how memories arise during spontaneous thought. Next, Signy Sheldon suggests that eye movements may be a window into how visual and memory systems interact during reconstruction. In the last talk, Asieh Zadbood discusses methods for examining memory replay, and evidence for how emotional memories may be differentially reinstated in healthy and depressed individuals. Together, these talks showcase the breadth and novelty of current techniques used to study autobiographical memory. These talks promise to promote further discussion on how methodological innovation can deepen our understanding of human recollection across a variety of populations.

TALK 1: AGE AND INDIVIDUAL DIFFERENCES IN AUTOBIOGRAPHICAL MEMORY RELATE TO DEFAULT NETWORK CONNECTIVITY

Roni Setton, Harvard University

Autobiographical memory (AM), involves the retrieval of both rich spatiotemporal details and deeper semantic context. The balance of details recalled systematically shifts with advancing age, as the episodic quality of memory diminishes and semantic features become more prominent. AM is supported by the default network, whose functional integrity also changes with age3. We take an individual differences approach to examine resting-state functional connectivity of key episodic and semantic memory regions—the hippocampus and temporal pole—with the default network, and test for associations with episodic and semantic AM in a cohort of healthy younger and older adults. We combined multiecho resting-state fMRI acquisition and denoising, individualized cortical parcellation, and automated segmentation of the hippocampus to increase BOLD sensitivity, account for individual variability in the default network, and investigate the separable contributions of anterior and posterior hippocampus to AM, respectively. The Autobiographical Interview was administered to measure AM. Multivariate analyses first identified age group differences in functional connectivity of this circuit. This pattern was associated with posterior hippocampus volumes in older adults, suggesting a link between local structural and distributed functional differences with age. Connectivity associations with AM showed two patterns: (i) an age-invariant pattern that dissociated episodic and semantic AM, and (ii) a pattern related to overall recollection only in younger adults. Our findings provide a high-resolution map of functional connectivity between temporal lobe structures and regions of the default network, and strong evidence for how variance in this map is sensitive to individual differences in recollection across the lifespan.

TALK 2: AUTOBIOGRAPHICAL MEMORY RECALL IN A SPONTANEOUS FLOW OF THOUGHTS

Hongmi Lee, Johns Hopkins University

When our minds wander, memories of past events arise amidst other thoughts. What are the cognitive and neural states that trigger autobiographical memory recall within the flow of spontaneous thoughts? To explore this question, we performed a “think aloud” fMRI experiment in which subjects were asked to verbally describe any thoughts that entered their consciousness for 10 minutes. Five major thought categories were identified: autobiographical episodic memory, autobiographical semantic memory, non-autobiographical semantic memory, future thinking, and current sensations and feelings. By computing transition probabilities between different categories of thoughts, we found that autobiographical recall was not triggered by any specific thought category more than expected by chance. However, semantic similarity, measured using a natural language processing model, was higher between an autobiographical memory and its immediately preceding and following thoughts compared to more distant ones, suggesting that memory recall was triggered by related thought content. We also searched for a specific spatial activation pattern in the default mode network which was previously associated with major shifts in mental context during naturalistic movie watching (Lee & Chen, 2022, eLife); we observed this pattern when the semantic contents of thoughts changed (i.e., broad shifts in topic), but less so when the thought category changed, implying that semantic content was the more important determinant of mental context transitions. Together, these results demonstrate that autobiographical memories are naturally retrieved by shared meanings without any task demands, and suggest that semantic connections may be a major organizing principle of the flow of spontaneous thoughts.

TALK 3: NEW INSIGHTS INTO THE LINK BETWEEN VISUAL AND MNEMONIC PROCESSING DURING AUTOBIOGRAPHICAL RETRIEVAL

Signy Sheldon, McGill University

The ability to reactivate and recombine visuospatial components of a past event is a central aspect of autobiographical event representations and suggests a critical link between visual and memory system. However, our understanding of how visual processes contribute to the construction of autobiographical event representations is limited. One reason for this limitation is that there is a dearth of studies that measure visual processing during autobiographical memory assessments. Here, I will describe an experiment that overcame this limitation by using eye movement monitoring and behavioural interferences techniques. In a first experiment, we first tested the impact of interfering with visual processing via Dynamic Visual Noise (DVN) on the ability to form and describe in detail various autobiographical events. When we scored these descriptions for detail specificity, we found that the presence of the DVN significantly reduced the ability of participants to provide specific details of the events. To better understand how visual processing contributes to event construction, we collected eye movement data as participants described these autobiographical events. Applying gaze similarity analysis to this eye movement data revealed that visual processing is particularly useful for reinstating schema-specific visuospatial details when constructing autobiographical events. Together these studies provide new approaches that enrich our understanding of the intimate link between visual and mnemonic processing for autobiographical event construction.

TALK 4: EVENT-LEVEL NEURAL REPRESENTATIONS AS A WINDOW TO THE CONTENT OF PAST EPISODES

Asieh Zadbood, Columbia University

Recalling and communicating past experiences is a common daily life activity. The content of these recalls, however, varies greatly between individuals. Idiosyncrasies in the recall of past episodes may stem from a variety of factors such as different original experiences or differences in retrieval and communication of the same events. These idiosyncrasies impose a challenge to studying the neural mechanisms supporting autobiographical memories. Event-level analysis, including methods that average the time-course of brain response within events or obtain a single regressor for the entire event, has been proposed as a tool to overcome this issue. As time-point data is not preserved in these methods, the question arises as to what type and granularity of information these representations contain. Across two fMRI studies, we investigated the information captured using these methods during communicating and updating memories. In one experiment, participants watched the same movie and one of them recounted the movie to a group of individuals naïve to the story. Using spatial pattern similarity analysis, we show that shared neural patterns across individuals in the default mode network are event-specific, are shared irrespective of the modality, and can be built from limited information. In the second study, we manipulated the interpretation of a movie after encoding that triggered updating of past memories to incorporate new knowledge. In some regions of the default mode network, we find evidence for memory updating, but only in the scenes relevant to the new interpretation. Our work suggests that event-level representations carry information about fine-grained content during the retrieval of past episodes.

Poster Schedule

Poster sessions are scheduled for Saturday-Tuesday in Pacific Concourse Exhibition Hall of the San Francisco Hyatt Regency. All attendees must present their CNS 2023 name badge to enter the exhibit hall. Do not leave personal items in the poster room. The presenting author must be present during the assigned session. You may post your materials on the board assigned to you at any time after the "Set-up Begins" time (listed below), but before the beginning of the assigned poster session. You must remove your poster promptly no later than the time listed above in "Take-down Complete." Any posters left up after the "Take-down Complete" time may be discarded. Note that presenters are asked to set up poster in advance of their session and to leave their poster up for a period following their session (see your specific session for hours). This is to allow attendees to view posters outside the formal session times. Only registered poster presenters, wearing a CNS 2023 meeting badge, for the current session and exhibitors will be allowed in the exhibit hall during set up and take-down hours. All other attendees will be turned away at the door. No attendee or exhibitor will be allowed to enter the exhibit hall after the Closed for the Day- No Entry hours.

Poster Session	Date	Setup Begins	Session Begins	Tear-Down	Take-Down Completed
A	Saturday, March 25	12:30 pm – 1:00 pm	3:00 pm – 5:00 pm	5:30 pm – 6:00 pm	6:00 pm
B	Sunday, March 26	7:30 am – 8:00 am	8:00 am – 10:00 am	11:30 am – 11:45 am	11:45 am
C	Sunday, March 26	1:30 pm – 2:00 pm	5:00 pm – 7:00 pm	7:00 pm – 7:15 pm	7:15 pm
D	Monday, March 27	7:30 am – 8:00 am	8:00 am – 10:00 am	11:30 am – 11:45 am	11:45 am
E	Monday, March 27	1:30 pm – 2:00 pm	2:30 pm – 4:30 pm	5:30 pm – 5:45 pm	5:45 pm
F	Tuesday, March 28	7:30 am – 8:00 am	8:00 am – 10:00 am	11:45 am - Noon	Noon

* Please note that only scheduled registered poster presenters may enter the exhibit hall during the half hour set-up time. **Note**: Please remove your poster promptly at take down complete time, so that the next presenter may set up their poster.

Poster Session A

Saturday, March 25, 3:00 pm - 5:00 pm, Pacific Concourse

A1 - Modifying the Paced Serial Addition Task to Investigate Auditory Cognition Using Pupillometry

Jeremy Loebach, St. Olaf College, Stephanie Sanchez, St Olaf College; Mike Guzman, St. Olaf College Rayan Elahi, St. Olaf College
ATTENTION: Auditory

A2 - Neural decoding of selective attention to speech from real-space recorded acoustic mixtures

Eshed Rabinovitch, The Gonda Center for Multidisciplinary Brain Research, Bar I, Paz Har-Shai Yahav, The Gonda Center for Multidisciplinary Brain Research, Bar I; Adi Korisky, The Gonda Center for Multidisciplinary Brain Research, Bar I Renana Vaknin-Harel, The Gonda Center for Multidisciplinary Brain Research, Bar I; Roi Gueta, School of Engineering, Bar-Ilan University, Israel; Sharon Gannot, School of Engineering, Bar-Ilan University, Israel; Elana Zion-Golumbic, The Gonda Center for Multidisciplinary Brain Research, Bar I
ATTENTION: Auditory

A3 - Graph-based Network Analysis of Visually Evoked Event-related Potential in Mild Cognitive Impairment

Marwa Antar, East Carolina University, Lana Wang, East Carolina University; John Christopher Mizelle, East Carolina University Sunghan Kim, East Carolina University
ATTENTION: Development & aging

A4 - Enhanced Respiratory Entrainment in Older Adults associated with greater focus during sustained attention

Ralph Andrews, Trinity College Dublin, Michael Melnychuk, Trinity College Dublin; Alexa Holfelda, Bern University Catherine Moran, Royal College of Surgeons in Ireland; Paul Dockree, Trinity College Dublin
ATTENTION: Development & aging

A5 - The effects of resonance breathing on locus coeruleus activity in young and older adults.

Andy Kim, University of Southern California, B. Rael Cahn, University of Southern California; Santiago Morales, University of Southern California Mara Mather, University of Southern California
ATTENTION: Development & aging

A6 - Age-Related Effects of Audiovisual Semantic Congruency on Living and Nonliving Object Perception
Jessica Ip, Brown University, William C. Heindel, Brown University; Elena K. Festa, Brown University
ATTENTION: Development & aging

A7 - Cognitive Interference Subtypes Differentially Modulate Alpha and Gamma Oscillatory Dynamics in Children
Lucas Weyrich, Creighton University / Boys Town National Research Hospital,
ATTENTION: Development & aging

A8 - Crossmodal dynamics of uncertain reward-driven distraction via frequency tagging
Francisco Cervantes Constantino, Instituto de Investigaciones Biol—gicas Clemente Estable, Rodrigo CaramŽs Harcevnicow, Instituto de Investigaciones Biol—gicas Clemente Estable; Alejandra Carboni, Universidad de la Rep‡blica, Uruguay Thaiz S‡nchez-Costa, Universidad de la Rep‡blica, Uruguay
ATTENTION: Multisensory

A9 - Neural Mechanisms of Cross-Modal Selective Attention for Auditory and Visual Stimuli
Tyler Statema, University of California Davis, Soukhin Das, University of California Davis; Sreenivasan Meyyappan, University of California Davis Mingzhou Ding, University of California Davis; George R. Mangun, University of California Davis
ATTENTION: Multisensory

A10 - Decoding Neural Patterns Associated with Cross-Modal Attention to Auditory and Visual Stimuli
Soukhin Das, University of California Davis, Sreenivasan Meyyappan, University of California Davis; Mingzhou Ding, University of Florida George R. Mangun, University of California Davis
ATTENTION: Multisensory

A11 - The Neural Mechanisms of Color Willed Attention
John Nadra, University of California, Davis, Mingzhou Ding, University of Florida; George Mangun, University of California, Davis
ATTENTION: Nonspatial

A12 - Task-specificity of pre-stimulus alpha in a mental effort paradigm: Does task specification enhance effects of reward?
Nathalie Liegel, Leibniz Research Centre for Human Factors, Daniel Schneider, Leibniz Research Centre for Human Factors; Edmund Wascher, Leibniz Research Centre for Human Factors Laura-Isabelle Klatt, Leibniz Research Centre for Human Factors; Stefan Arnau, Leibniz Research Centre for Human Factors
ATTENTION: Other

A13 - Target detection does not influence temporal memory
Yuxi Candice Wang, Duke University, Tobias Egner, Duke University
ATTENTION: Other

A14 - Shifting attention within and between perception and working memory
Daniela Gresch, University of Oxford, Sage E.P. Boettcher, University of Oxford; Freek van Ede, Vrije Universiteit Amsterdam Anna C. Nobre, University of Oxford
ATTENTION: Other

A15 - Investigating sensory and motor rhythmic sampling in behaviour
Sage Boettcher, University Of Oxford, Berit Hartjen, Princeton University; Sabine Kastner, Princeton University; Kia Nobre, University of Oxford
ATTENTION: Other

A16 - The relationship between microsaccades and pupil response in a covert spatial attention paradigm
Grace Bell, University of California, Davis, Lee Holcomb, University of California, Davis; Alex Cohen, University of California, Davis Kyle Astleford, University of California, Davis; George Mangun, University of California, Davis
ATTENTION: Spatial

A17 - Cueing Spatial Attention Within Visual Mental Imagery and Perception

Natalie Baer, Columbia University, Alfredo Spagna, Columbia University
ATTENTION: Spatial

A18 - Spatial Memory Improvements due to Reactivation: Does the Background Context Matter?
Authors: Subramanian, G., Paller., K.A.
Author Affiliations: Northwestern University
Gayathri Subramanian, Northwestern University,
ATTENTION: Spatial

A19 - EEG of Mental Imagery Elicited by Distractors in the Flanker Task
Fanqi Kong, San Francisco State University, Dennis Lambert, San Francisco State University; Yanming Li, San Francisco State University Ezequiel Morsella, San Francisco State University; Mark Geisler, San Francisco State University
ATTENTION: Spatial

A20 - Investigating the Interaction of Fluctuations in Spatial Attentional Flexibility and Sustained Attention
Madison P. Shaver, Wake Forest University, Anna B. Toledo, Wake Forest University; Anthony W. Sali, Wake Forest University
ATTENTION: Spatial

A21 - The effects of covert spatial attention and working memory capacity on early visually-evoked potentials
Lee Holcomb, University of California, Davis, Grace Bell, University of California, Davis; Alex Cohen, University of California, Davis Kyle Astleford, University of California, Davis; George Mangun, University of California, Davis
ATTENTION: Spatial

A22 - Alpha desynchronization tracks the spread of attention across visual objects
Damiano Grignolio, University of Birmingham, Joy Geng, University of California Davis; George Mangun, University of California Davis Clayton Hickey, University of Birmingham
ATTENTION: Spatial

A23 - Electrophysiological indices of selective attention predict the quality of object representation in the lateral occipital cortex: evidence from EEG decoding
Clayton Hickey, University of Birmingham, David Acunzo, University of Birmingham; Damiano Grignolio, University of Birmingham Holly Ahmed, University of Birmingham; Vinura Munasinghe, University of Birmingham
ATTENTION: Spatial

A24 - Exploration on the reliance of spatial and temporal information in a triplet segmentation task of trajectories in signers and non-signers
Yi-Syuan Huang, National Central University, Denise Hsien Wu, National Central University
LANGUAGE: Other

A25 - Association of artistic brush-writing with mood and brain activity: an fNIRS study
Yutaka Matsuzaki, Tohoku University, Risako Kojima, Tohoku University; Ryuta Kawashima, Tohoku University
LANGUAGE: Other

A26 - Subject omission is more strongly preferred in Japanese than in Chinese: An Event-Related Potential study
Liya Cheng, Tohoku University, Shiori Kato, Tohoku University; Masatoshi Koizumi, Tohoku University Sachiko Kiyama, Tohoku University
LANGUAGE: Other

A27 - Behavioral and neurophysiological evidence for distinct statistical learning mechanisms of temporal and spatial positional regularity in alphabetic and logographic readers
Andhika Renaldi, National Central University, Taiwan, Denise Wu, National Central University, Taiwan
LANGUAGE: Other

A28 - Neural substrates of embodied second-language learning: A virtual reality and functional near-infrared spectroscopy study
Jean Bodet III, University of Houston, Hong Kong Polytechnic University, Ping Li, Hong Kong Polytechnic University; Arturo Hernandez, University of Houston
LANGUAGE: Other

A29 - Harnessing Statistical Learning to Support the Discovery of Second Language Phonetic Patterns in Adult Learners
ƒmilie Rae Hoeppner, The University of Western Ontario, Amiya Aggarwal, The University of Western Ontario; Laura Batterink, The University of Western Ontario
LANGUAGE: Other

A30 - Can statistical learning support speech segmentation of a natural language in adult learners?
Amiya Aggarwal, University of Western Ontario, Émilie Hoeppner, University of Western Ontario; Laura Batterink, University of Western Ontario
LANGUAGE: Other

A31 - Directional Anisotropy in the Kinematic Analysis of Co-Speech Movements during Discourse Processing
Jacob Momsen, SDSU/UCSD, Seana Coulson, UC San Diego
LANGUAGE: Other

A32 - Pre-stimulus brain activity predicts social-communicative function of upcoming utterances
Salome Antoine, Freie Universitat Berlin, Luigi Grisoni, Freie Universitat Berlin; Rosario Tomasello, Freie Universitat Berlin Friedemann Pulvermüller, Freie Universitat Berlin
LANGUAGE: Other

A33 - Evaluation of inter-cognitive interaction in healthy subjects and perspectives in Rasmussen encephalitis after hemispherotomy: a behavioral network approach
Anna Borne, Univ. Grenoble Alpes, CNRS, LPNC, Christine Bulteau, H™pital Fondation Adolphe de Rothschild; Marcela Perrone-Bertolotti, Univ. Grenoble Alpes, CNRS, LPNC Monica Baciu, Univ. Grenoble Alpes, CNRS, LPNC
LANGUAGE: Other

A34 - Do Spanish-English bilinguals pre-activate lower-level lexical features when predicting in L2?
Elaina Jahanfard, UC Davis, Tamara Swaab, UC Davis
LANGUAGE: Other

A35 - Temporal alignment of word retrieval processes in auditory versus visual confrontation naming
Eliza Reedy, Carnegie Mellon University, Jawaad Belkhir, University of Pittsburgh; Theodor Cucu, Carnegie Mellon University Arka Mallela, University of Pittsburgh; Anna Keresztesy, Carnegie Mellon University; Luke Henry, University of Pittsburgh; Jorge Gonzalez-Martinez, University of Pittsburgh; Bradford Mahon, Carnegie Mellon University
LANGUAGE: Other

A36 - Learning novel word meanings in bilinguals' second language: An ERP study
Daisy Lei, The Pennsylvania State University, Janet G. van Hell, The Pennsylvania State University
LANGUAGE: Other

A37 - Plasticity of grammatical and semantic word processing networks in brains of congenitally blind individuals
Marta Urbaniak, Institute of Psychology, Polish Academy of Sciences, Malgorzata Paczynska, SWPS University of Social Sciences and Humanities; Alfonso Caramazza, Department of Psychology, Harvard University Lukasz Bola, Institute of Psychology, Polish Academy of Sciences
LANGUAGE: Other

A38 - Hippocampal subfield activity during sentence reading
Nields Janssen, Universidad de La Laguna, Sara Seoane, Universidad de La Laguna; Michael Yassa, University of California, Irvine
LANGUAGE: Other

A39 - The predictability effect on the N400 and LPC during spoken sentence comprehension under noisy conditions
Cheng-Hung Hsin, Academia Sinica, Chia-Ying Lee, Academia Sinica
LANGUAGE: Semantic

A40 - The anterior temporal semantic hub in the left and right hemispheres: A unified system or two separate systems for meaning?
Tomoki Uno, National Rehabilitation Center for Persons with Disabilities, Marc Teichmann, H™pital de la PitiŽ Salp□tri□re; Kouji Takano, National Rehabilitation Center for Persons with Disabilities Mio Yokoi, National Rehabilitation Center for Persons with Disabilities; Kimihiro Nakamura, National Rehabilitation Center for Persons with Disabilities
LANGUAGE: Semantic

A41 - Action strength norms predict concreteness effects in a regression ERP study
Harshada Vinaya, University of California San Diego, Shang-En Huang, University of California San Diego; Haoyin Xu, University of California San Diego Seana Coulson, University of California San Diego
LANGUAGE: Semantic

A42 - Multilevel pre-activation of lexical features during prediction-driven word production: an ERP study (in progress)
Agnes (Yang) Gao, University of California Davis, Timothy Trammel, University of California Davis; Tamara Swaab, University of California Davis Matthew Traxler, University of California Davis
LANGUAGE: Semantic

A43 - Temporal Features of Concepts are Subserved by Time Perception Network ?in the Human Brain: An EEG/HD-tDCS Study
Fatemeh Tabari, Louisiana State University, Karim Johari, Louisiana State University; Rutvik Desai, University of South Carolina
LANGUAGE: Semantic

A44 - Subregions of the visual word form area show distinct patterns of functional connectivity
Maya Yablonski, Stanford University, Iliana Karipidis, University of Zurich; Emily Kubota, Stanford University Jason Yeatman, Stanford University
LANGUAGE: Other

A45 - Verbal Working Memory depends on Network Architecture: Generalization across Brain-constrained Network Models
Maxime Carri□re, Freie UniversitŠt, Rosario Tomasello, Freie UniversitŠt; Friedemann Pulvermüller, Freie UniversitŠt
LANGUAGE: Semantic

A46 - The role of curiosity and the testing effect in memory performance.
Ryuto Tashima, Tohoku University, Ayano Yagi, Hiroshima Shudo University; Rui Nouchi, Tohoku University Ryuta Kawashima, Tohoku University
LONG-TERM MEMORY: Semantic

A47 - Similarity and Distinctiveness of Memory Representations Predict Subsequent Memory for Different Semantic Categories
Christina Yu, Duke University, Shenyang Huang, Duke University; Cortney Howard, Duke University Roberto Cabeza, Duke University; Simon Davis, Duke University
LONG-TERM MEMORY: Semantic

A48 - Semantic future thinking in adults with moderate-severe traumatic brain Injury
Victoria-Grace Padilla, Vanderbilt University Medical Center, Sharice Clough, Vanderbilt University; Greta Melega, University of East Anglia Louis Renoult, University of East Anglia; Melissa Duff, Vanderbilt University; Annick F.N. Tanguay, Vanderbilt University
LONG-TERM MEMORY: Semantic

A49 - A high-resolution fMRI investigation of the role of hippocampal pattern separation of conceptually similar memory traces
Alex IlyŽs, Eštvšs Lor‡nd University, Borb‡la Paulik, Research Centre for Natural Sciences; M‡rton Munding, Eštvšs Lor‡nd University; B‡lint Forg‡cs, Eštvšs Lor‡nd University; Attila Keresztes, Research Centre for Natural Sciences
LONG-TERM MEMORY: Semantic

A50 - Schema Effects on Memory Representation: Aging and MCI
Erin Welch, Duke University, Lifu Deng, Duke University; Margaret McAlllister, Duke University Christina Yu, Duke University; Shenyang Huang, Duke University; Ricardo Morales Torres, Duke University; Cortney Howard, Duke University; Simon Davis, Duke University; Roberto Cabeza, Duke University
LONG-TERM MEMORY: Semantic

A51 - Estimating Neuronal Timescales in Sleep
Ryan Hammonds, University of California, San Diego, Blanca Martin-Burgos, University of California, San Diego; Trevor McPherson, University of California, San Diego Richard Gao, Tübingen University; Bradley Voytek, University of California, San Diego
METHODS: Electrophysiology

A52 - Delayed Prediction during Language Comprehension in Schizophrenia: An Electrophysiological Investigation
Wen Li, University of California, Davis, Cameron Carter, University of California, Davis; Megan Boudewyn, University of California, Santa Cruz
METHODS: Electrophysiology

A53 - Fluctuations in Resting EEG Covary with Concurrent Cardiac Measurements in Children and Adults
Mohammad Soleyman Nejad, University of Manitoba, Thomas Rawliuk, University of Manitoba; Louise Andrea Viernes Torre, University of Manitoba Ryan Giuliano, University of Manitoba
METHODS: Electrophysiology

A54 - Simulation Analysis of Event-Related Causality and Renormalized Partial Directed Coherence in Electroencephalography and Magnetoencephalography
Patrick Bloniasz, Boston University, Matthew Perez, Bowdoin College; Makoto Miyakoshi, University of California San Diego Hyeonseok Kim, University of California San Diego; Yang Tian, Tsinghua University; Erika Nyhus, Bowdoin College
METHODS: Electrophysiology

A55 - Diffusion Tensor Imaging Measures Reveal Impaired Glymphatic Functions in Gulf War Illness
Yu Zhang, WRIISC and VA Palo Alto Health Care System, Matthew Moore, WRIISC and VA Palo Alto Health Care System; David Clark, VA Palo Alto Health Care System Peter Bayley, WRIISC and VA Palo Alto Health Care System; J. Wesson Ashford, WRIISC and VA Palo Alto Health Care System; Ansgar Furst, WRIISC and VA Palo Alto Health Care System
METHODS: Neuroimaging

A56 - Developmental Trajectory of Reward-Related Brain Activations in Typically Developing Children
Madeleine Goldberg, National Institutes of Health, Shau-Ming Wei, National Institutes of Health; Katherine Cole, National Institutes of Health J. Shane Kippenhan, National Institutes of Health; Michael Gregory, National Institutes of Health; Christina Recto, National Institutes of Health; Isabel Wilder, National Institutes of Health; Destiny Wright, National Institutes of Health; Lynnette Nieman, National Institutes of Health; Jack Yanovski, National Institutes of Health; Peter Schmidt, National Institutes of Health; Karen Berman, National Institutes of Health
METHODS: Neuroimaging

A57 - Magnetic resonance-based multimodal imaging patterns associated with health concerns in veterans
Matthew Moore, Veterans Affairs Palo Alto Health Care System, Yu Zhang, Veterans Affairs Palo Alto Health Care System; Ansgar Furst, Veterans Affairs Palo Alto Health Care System
METHODS: Neuroimaging

A58 - Utilization of EEG and functional connectivity to demonstrate the relationship between musical training, cognition, and memory.
Nicolas Adams, East Carolina University, Kim Sunghan, East Carolina University
METHODS: Neuroimaging

A59 - Parental education, cognition and functional connectivity of the salience network
Pavla Cermakova, Charles University, Adam Chlape?ka, Charles University; Lenka Andryskova, Masaryk University Milan Brazdil, Masaryk University; Klara Mareckova, Masaryk University
METHODS: Neuroimaging

A60 - Estimating the Minimum Sample Size for Reliable Group-Level Connectivity Matrices Using Subjects from The Human Connectome Project
Kriti Achyutuni, University of California, Berkeley, Savannah Cookson, University of California, Berkeley; Mark D'Esposito, University of California, Berkeley
METHODS: Neuroimaging

A61 - Age-related changes in the resting state functional connectivity of hippocampus and the effects of academic achievement
Angela Gori, State University of New York at Oswego, Oswego, NY, Chiang-Shan Li, Yale University School of Medicine; Sien Hu, State University of New York at Oswego, Oswego, NY
METHODS: Neuroimaging

A62 - Examining electrical brain activity using mobile electroencephalography in older adults and Parkinson's disease during
mobility in a real-world environment
Samantha Marshall, Western University, Lindsay Nagamatsu, Western University
METHODS: Neuroimaging

A63 - Functional Near-Infrared Spectroscopy (fNIRS) for Investigating Broca's Function & Lateralization
Youstina Tadros, Belmont University, Prathyusha Gowri Srinivasan, Belmont University; Keirsten Howard, Belmont University Hannah Potts, Belmont University; Carole Scherling, Belmont University
METHODS: Neuroimaging

A64 - Mechanistic Predictions of Future Physical Activity Behaviours from Baseline Brain Structure and Function
Naga Thovinakere, McGill University, Maiya Geddes, McGill University
METHODS: Neuroimaging

A65 - Adaptive Sample Size Determination for Neuroimaging using Sequential Analyses
John Veillette, University of Chicago, Letitia Ho, University of Chicago; Howard Nusbaum, University of Chicago
METHODS: Neuroimaging

A66 - Estimating Individual Trajectories of Structural and Cognitive Decline in Mild Cognitive Impairment
Shreya Rajagopal, University of Michigan, Adriene Beltz, University of Michigan; Benjamin Hampstead, University of Michigan Thad Polk, University of Michigan
METHODS: Neuroimaging

A67 - The NITRC Triad of Services: Software, Data, and Compute
Christian Haselgrove, NITRC, Richard Brash, NITRC; Albert Crowley, NITRC David Kennedy, NITRC; Abby Paulson, NITRC; Nina Preuss, NITRC
METHODS: Other

A68 - neuromaps: structural and functional interpretation of brain maps.
Justine Hansen, McGill University, Ross Markello, Komodo Health; Zhen-Qi Liu, McGill University Vincent Bazinet, McGill University; Golia Shafiei, University of Pennsylvania; Laura Suarez, McGill University; Nadia Blostein, McGill University; Jakob Seidlitz, University of Pennsylvania; Sylvain Baillet, McGill University; Theodore Satterthwaite, University of Pennsylvania; Mallar Chakravarty, McGill University; Armin Raznahan, National Institute of Mental Health; Bratislav Misic, McGill University
METHODS: Other

A69 - Finger movement decoding using an ultra-high-density EEG system
Leonhard Schreiner, Johannes Kepler University Linz / g.tec medical engineering, Micah Ching, g.tec medical engineering GmbH; Christoph Guger, g.tec medical engineering GmbH
METHODS: Other

A71 - Realizing Dynamic Cognitive Tasks with Cloud-based Computation
Henry Burgess, Washington University in St. Louis, Joseph Barnby, Royal Holloway, University of London; Peter Dayan, Max Planck Institute for Biological Cybernetics Linda Richards, Washington University in St. Louis
METHODS: Other

A72 - Development of tools for estimating premorbid cognitive abilities in visually impaired and blind adults
Peter Bright, Anglia Ruskin University, Kennedy Cadman, Anglia Ruskin University; Martina Finessi, Anglia Ruskin University Ian van der Linde, Computing and Information Science
METHODS: Other

A73 - Online paediatric EEG handbook: a survey on its usefulness
Veena Kander, University of Cape Town, South Africa, Joanne Hardman, Department of Education, University of Cape Town, South Africa; Jo Wilmshurst, Department of Paediatric Neurology, Red Cross War Memorial ChildrenÕs Hospital, Neuroscience Institute, University of Cape Town, South Africa
METHODS: Electrophysiology

A74 - Modeling multi-talker speech comprehension in normal and hearing-impaired listeners
Jixing Li, City University of Hong Kong, Qixuan Wang, Shanghai Jiao Tong University; Qian Zhou, Shanghai Jiao Tong University Shujian Huang, Nanjing University; Zhiwu Huang, Shanghai Jiao Tong University
PERCEPTION & ACTION: Audition

A75 - Investigating the mechanisms of precise predictive timing: behavior and intracranial EEG
Sydney Smith, University of California San Diego, Ali Rigby, University of California San Diego; Keith Doelling, Institut Pasteur, Paris Bradley Voytek, University of California San Diego
PERCEPTION & ACTION: Audition

A76 - The interplay of the GABAA receptor polymorphisms and excitatory?inhibitory brain metabolite levels linked to autism spectrum conditions (ASC)
Yang-Teng Fan, Yuan Ze University, Tsai-Tsen Liao, Taipei Medical University; Shang-Yueh Tsai, National Chengchi University Chung-Hsin Chiang, National Chengchi University; Shih-Han Chou, Taipei Medical University Hospital; Chenyi Chen, Taipei Medical University; Yawei Cheng, National Yang Ming Chiao Tung University
PERCEPTION & ACTION: Development & aging

A77 - Positive expectations need time to improve joint flexibility
LUCA FALCIATI, UNIVERSITY OF BRESCIA, SILVIA RIO, UNIVERSITY OF BRESCIA; CLAUDIO MAIOLI, UNIVERSITY OF BRESCIA FRANCESCO NEGRO, UNIVERSITY OF BRESCIA; DEBORA BRIGNANI, UNIVERSITY OF BRESCIA
PERCEPTION & ACTION: Motor control

A78 - Cortical and Cerebellar Contributions to Sensorimotor Learning Across Speeds in a Finger Pressing Task
Pierre Gianferrara, Carnegie Mellon University, Shawn Betts, Carnegie Mellon University; Jon Fincham, Carnegie Mellon University John Anderson, Carnegie Mellon University
PERCEPTION & ACTION: Motor control

A79 - Does Motor Imagery Require More Cognitive Resource Than Motor Execution?
Hsin-Ping Tien, National Central University, Erik Chang, National Central University
PERCEPTION & ACTION: Motor control

A80 - Resting State Functional Connectivity Lesion-Symptom Mapping of the Tool Use Network
Frank Garcea, University of Rochester, Emma Strawderman, University of Rochester; Joseph Barone, University of Rochester William Burns, University of Rochester; Stephen Meyers, Unviersity of Rochester; Tyler Schmidt, University of Rochester; Kevin Walter, Unviersity of Rochester; Webster Pilcher, University of Rochester; Bradford Mahon, Carnegie Mellon University
PERCEPTION & ACTION: Motor control

A81 - Individual differences in multisensory illusory perception
Maggie Baird, Occidental College, Aleksandra Sherman, Occidental College; Carmel Levitan, Occidental College
PERCEPTION & ACTION: Multisensory

A82 - Investigating cross-modal transfer between echoic, visual, and haptic information in object discrimination tasks
Caroline Danforth, University of Central Arkansas, Nick Paternoster, University of Central Arkansas; David Whitney, University of California, Berkeley Amrita Puri, University of Central Arkansas; Santani Teng, Smith-Kettlewell Eye Research Institute
PERCEPTION & ACTION: Multisensory

A83 - Hearing/Seeing it approaching: neural correlates of multisensory looming cues integration in the autistic personality
Rachel Poulain, University of Toulouse 2, Magali Batty, University of Toulouse 2; Celine Cappe, University of Toulouse 3
PERCEPTION & ACTION: Multisensory

A84 - Causal Evidence for the Processing of Bodily Self in the Anterior Precuneus
Dian Lu, Stanford University, Josef Parvizi, Stanford University; James Stieger, Stanford University Karl Deisseroth, Stanford University; Vivek Buch, Stanford University
PERCEPTION & ACTION: Multisensory

A85 - Efficacy and mechanisms of virtual reality treatment of phantom leg pain
Elisabetta Ambron, University of Pennsylvania, Rand Williamson, Moss Rehabilitation Research Institute; Maxim Karrenbach, University of Washington Jing-Sheng Li, University of Washington; Erik Rombokas, University of Washington; H Branch Coslett, University of Pennsylvania; Laurel Buxbaum, Moss Rehabilitation Research Institute
PERCEPTION & ACTION: Multisensory

A86 - Spinal Cord Injury and Neuropathic Pain reduce Multisensory Integration
Roberta Vastano, University of Miami, Eva Widerstrom-Noga, University of Miami
PERCEPTION & ACTION: Multisensory

A87 - Cortical tracking of speech in the presence of visual distractor in children with CI and hearing children: longitudinal study
Tatiana Matyushkina, UC Davis, Tatiana Matyushkina, UC Davis, Center for Mind and Brain; Sharon Coffey-Corina, UC Davis, Center for Mind and Brain Lee Miller, UC Davis, Center for Mind and Brain; David Corina, UC Davis, Center for Mind and Brain
PERCEPTION & ACTION: Multisensory

A88 - Neural representations of temporal prediction signals in multiple time scales: An EEG study
Yiyuan Huang, The University of Tokyo, Zenas Chao, The University of Tokyo; Shinsuke Koike, The University of Tokyo
PERCEPTION & ACTION: Other

A89 - Groupitizing reflects conceptual developments in math cognition and inequities in math achievement from childhood through adolescence
Mathieu Guillaume, Stanford University, Ethan Roy, Stanford University; Amandine Van Rinsveld, Stanford University Gillian S. Starkey, Goucher College; Melina R. Uncapher, University of California San Francisco; Bruce D. McCandliss, Stanford University
PERCEPTION & ACTION: Other

A90 - Cognition and Driving after Unilateral Stroke
Krista Schendel, Veterans Affairs NCHCS, Timothy Herron, Veterans Affairs NCHCS; Isabella Santavicca, Veterans Affairs NCHCS Jas Chok, Veterans Affairs NCHCS; Brian Curran, Veterans Affairs NCHCS; Juliana Baldo, Veterans Affairs NCHCS
PERCEPTION & ACTION: Other

A91 - Effects of spontaneous alpha-band activity on visual detection across the perceptual contrast response function
April Pilipenko, University of California, Santa Cruz, Jason Samaha, University of California, Santa Cruz; Antonia Gergen, University of California, Santa Cruz Nitu Gupta, University of California, Santa Cruz; Shirin Afrakhteh, University of California, Santa Cruz; Alex Feghhi, University of California, Santa Cruz
PERCEPTION & ACTION: Vision

A92 - The Effects of Acute Hypoxia on Visual Processing: A Simultaneous fNIRS/EEG Investigation
Kara Blacker, Naval Medical Research Unit - Dayton, Elizabeth Shoda, Leidos; Cammi Borden, Oak Ridge Institute of Science & Education
PERCEPTION & ACTION: Vision

A93 - Rhythms for Vision: Temporal dynamics of primate saccades
Tim NŠher, Ernst-StrŸngmann Institute for Neuroscience, Yufeng Zhang, Ernst-StrŸngmann Institute for Neuroscience; Pascal Fries, Ernst-StrŸngmann Institute for Neuroscience
PERCEPTION & ACTION: Vision

A94 - Individual Alpha Frequency Appears Unrelated to the Latency of Early Visual Responses
Audrey Morrow, University of California Santa Cruz, Wei Dou, University of California Santa Cruz; Jason Samaha, University of California Santa Cruz
PERCEPTION & ACTION: Vision

A95 - Precision: Developing a Novel Parameter that Quantifies Performance on Random Dot Kinematograms
Maycee McClure, Columbia University, Alfredo Spagna, Columbia University
PERCEPTION & ACTION: Vision

A96 - The influence of subjective visibility on illusory contour perception: An EEG study
Jisub Bae, Institute for Basic Science (IBS), Oliver James, Institute for Basic Science (IBS); Yee Joon Kim, Institute for Basic Science (IBS)
PERCEPTION & ACTION: Vision

A97 - A retinotopic reference frame structures communication between visual and memory systems
Adam Steel, Dartmouth College, Brenda Garcia, Dartmouth College; Edward Silson, University of Edinburgh Caroline Robertson, Dartmouth College
PERCEPTION & ACTION: Vision

A98 - Altered cingulate functional connectivity impairs visual cognition in response to negative incongruence
Ratna Sharma, All India Institute of Medical Sciences, Angel Zacharia, All India Institute of Medical Sciences; Simran Kaur, All India Institute of Medical Sciences
PERCEPTION & ACTION: Vision

A99 - Decode the Unseen: Classifying Action Representations During the Anticipatory Interval in the Action Observation Network (AON)
Xiaojue Zhou, University of California Irvine, Brandon Hackney, University of California Irvine; Sajjad Torabian, University of California Irvine John Pyles, University of Washington; Emily Grossman, University of California Irvine
PERCEPTION & ACTION: Vision

A100 - Heartbeats influence visual perception in the absence of distractors
Esra Al, Columbia University, Sameer Sheth, Baylor College of Medicine; Saskia Haegens, Columbia University
PERCEPTION & ACTION: Vision

A101 - Actively generated stimuli are more precisely reproduced: a psychophysics and EEG study
Emmanuelle Bonnet, UniversitŽ Aix Marseille, ONERA, Louise Barne, UCL; Andrea Desantis, Aix Marseille UniversitŽ, ONERA, Guillaume Masson, Aix Marseille UniversitŽ
PERCEPTION & ACTION: Vision

A102 - Metacognitive Introspection Modulates Evidence Accumulation for Decision Making
Wei Dou, University of California, Santa Cruz, Shirin Afrakhteh, University of California, Santa Cruz; Kamryn Callwood, University of California, Santa Cruz Alex Feghhi, University of California, Santa Cruz; Jason Samaha, University of California, Santa Cruz
PERCEPTION & ACTION: Vision

A103 - PERCEPTION & ACTION: Vision
Prerna Dash,
School of Life Sciences, JSS Academy of Higher Education and Research, Mysore, Karnataka, India

Poster Session B

Sunday, March 26, 8:00 am - 10:00 am, Pacific Concourse

B1 - Neural evidence for affective priming of facial expressions on the processing emotional words in late childhood.
Peiwen Yeh, Kaohsiung Medical University, Peiwen Yeh, Kaohsiung Medical University
EMOTION & SOCIAL: Development & aging

B2 - Behavioral Dynamics in a Group Class Setting in Adults with Neurodevelopmental Disorders
Alana Montanez, The Johns Hopkins University School of Medicine, Amanda Kessler, The Johns Hopkins University School of Medicine; Katie Davis, The Johns Hopkins University School of Medicine Barry Gordon, The Johns Hopkins University School of Medicine; Derek Smith, The Johns Hopkins University School of Medicine
EMOTION & SOCIAL: Development & aging

B3 - Attentional positivity bias is moderated by age, depression, and emotion regulation strategy use: an eye-tracking study
Leonard Faul, Duke University, Lucas Bellaiche, Duke University; John Graner, Duke University Moria Smoski, Duke University; Kevin LaBar, Duke University
EMOTION & SOCIAL: Development & aging

B4 - Auditory and Reward Connectivity in Young and Older Adults During Music Listening and Rest
Alexander Belden, Northeastern University, Milena Quinci, Northeastern University; Suzanne Hanser, Berklee College of Music Nancy Donovan, Brigham and Women's Hospital and Harvard Medical School; Maiya Geddes, Mcgill University; Psyche Loui, Northeastern University
EMOTION & SOCIAL: Development & aging

B5 - Relationship between neuroticism and neural activation during two cognitive emotion regulation strategies
Narutoshi Sato, Tohoku University, Yutaka Matsuzaki, Tohoku University; Ryuta Kawashima, Tohoku university
EMOTION & SOCIAL: Emotion-cognition interactions

B6 - Assessing Cognitive-Affective Sensitivity in Misokinesia: An ERP Study
Sumeet Jaswal, University of British Columbia, Alyssa Sutherland, University of British Columbia; Todd Handy, University of British Columbia
EMOTION & SOCIAL: Emotion-cognition interactions

B7 - Dissociating the effects of processing fluency from aesthetic experience in visual art viewing
Anna Smith, Duke University, Ting Ho, Duke University; Felipe De Brigard, Duke University Elizabeth Marsh, Duke University
EMOTION & SOCIAL: Emotion-cognition interactions

B8 - Can sleep be improved via targeted memory reactivation for stress reduction?
Remington Mallett, Northwestern University, Kristin E.G. Sanders, University of Notre Dame; Jessica D. Payne, University of Notre Dame Ken A. Paller, Northwestern University
EMOTION & SOCIAL: Emotion-cognition interactions

B9 - Hear Here: Emotional Laterality can also be probed by auditory words.
Prathyusha Gowri Srinivasan, Belmont University, Farris Turner, Belmont University; John Anderson, Belmont University Brigham Finch, Belmont University; Carole Scherling, Belmont University; Michael Oliver, Belmont University
EMOTION & SOCIAL: Emotion-cognition interactions

B10 - Ancillary Effects of High-Definition tDCS on Psychophysiology and Cognition in Adults Under Pharmacological Treatment for Anxiety Disorders
Taylor Orsini, Drexel University, Evangelia G. Chrysikou, Drexel University
EMOTION & SOCIAL: Emotion-cognition interactions

B11 - Multiple Dimensions Contribute to Embodied Processing of Emotion Concepts
Alexandra Kelly, Drexel University, Priya Dudhat, Drexel University; Evangelia G. Chrysikou, Drexel University
EMOTION & SOCIAL: Emotion-cognition interactions

B12 - A Comparison of Modern Measures of Brain Volume: An Examination of Loneliness Across the Lifespan
Hannah Apostolou, University of Alabama, Ian McDonough, University of Alabama
EMOTION & SOCIAL: Emotion-cognition interactions

B13 - Cognitive and Motor Neural Network Interaction during Threat Response
Olivia Cook, University of Louisville, Siraj Lyons, University of Louisville; Brendan Depue, University of Louisville
EMOTION & SOCIAL: Emotion-cognition interactions

B14 - Enhanced encoding and recognition of emotionally laden words in Mandarin: ERP and behavioral evidence
Yen-Lin PAN, Aix-Marseille UniversitŽ, Cheryl Frenck-Mestre, Aix-Marseille UniversitŽ - CNRS
EMOTION & SOCIAL: Emotion-cognition interactions

B15 - Angiotensin-II antagonist enhances parahippocampal processing during memory encoding in high-anxious individuals
Lorika Shkreli, University of Oxford, Theodora Thoroddsen, University of Oxford; Marieke Martens, University of Oxford Malte Kobelt, Ruhr-UniverstitŠt Bochum; Michael Browning, University of Oxford; Philip J Cowen, University of Oxford; Andrea Reinecke, University of Oxford
EMOTION & SOCIAL: Emotion-cognition interactions

B16 - Identifying the shared and distinct cognitive mechanisms underlying mood and behavioural symptoms in Parkinson?s disease using a reward learning task
Sophie Sun, McGill University, Madeleine Sharp, McGill University
EMOTION & SOCIAL: Emotion-cognition interactions

B17 - Resting-state functional connectivity patterns linked to individual differences in interpretation bias for emotional information
Dahlia Kassel, Northern Michigan University, John Foley, Northern Michigan University; Andrew Hauler, Northern Michigan University; Caleb Coughtry-Carpenter, Northern Michigan University; Grace Westric, Northern Michigan University; Joshua Carlson, Northern Michigan University; Lin Fang, Northern Michigan University; Makayla Mattson, Northern Michigan University
EMOTION & SOCIAL: Emotion-cognition interactions

B18 - Cortical E/I imbalance precipitates sensory cortical hyperactivity in trait-anxious individuals
Zhaohan Wu, Florida State University, Yuqi You, Zhejiang University; Joshua Brown, Florida State University Wen Li, Florida State University
EMOTION & SOCIAL: Emotion-cognition interactions

B19 - Frontal Midline Theta Oscillations in Trait Anxiety and Episodic Memory
Tamari Shalamberidze, University of Alberta, Kyle Nash, University of Alberta; Jeremy Caplan, University of Alberta
EMOTION & SOCIAL: Emotion-cognition interactions

B20 - Acute exercise modulates fear generalization and extinction
Mei E, Shenzhen Institute of Neuroscience,
EMOTION & SOCIAL: Emotional responding

B21 - High performance athletes in combat sports: understanding the neural bases of aggression.
Eduardo Gonzalez-Alema–y, Cuban Neuroscience Center, Mar'a A. BobesÊ Le—n, Cuban Neuroscience Center, La Habana , Cuba; Jorge Armony, McGill Univesity, Douglas Hospital Research Centre, Montreal , Canada; Anelin Rodr'guezÊ Olivera, Institute of Sports Medicine, Cerro Pelado, La Habana , Cuba; Luis Gonz‡lez Carballido, Institute of Sports Medicine, Cerro Pelado, La Habana , Cuba; Yanely AcostaÊ Ymas, Cuban Neuroscience Center, La Habana ,ÊCuba; Dianela Mil‡n Ricketts, University of Havana, La Habana , Cuba
EMOTION & SOCIAL: Emotional responding

B22 - Cathodal Transcranial Direct Current Stimulation to the Right Ventrolateral Prefrontal Cortex Does Not Impact Aggressive Responses Following Social Exclusion
Kevin Wilson, Gettysburg College, Kaitlin M. Lewin, Gettysburg College; Paige E. Merz, Gettysburg College Taylor-Jo Russo, Gettysburg College; M. Nicole Buckley, Gettysburg College; Sofia S. Taipina, Gettysburg College; Olivia L. Biggs, Gettysburg College; Fabio Lo, Gettysburg College; Kristina M. Heliodoro, Gettysburg College
EMOTION & SOCIAL: Emotional responding

B23 - Auditory and Reward System Activity for Vocal and Instrumental Music in Cognitively Healthy Young and Older Adults
Odessa Deng, Harvard University, Nick Kathios, Northeastern University; Psyche Loui, Northeastern University
EMOTION & SOCIAL: Emotional responding

B24 - Major Coping-behavior and Risk-perception Factors for the COVID-19 Pandemic and their Psychobehavioral Characteristics
Yi Ding, Tohoku University, Ryo Ishibashi, Tohoku University; Tsuneyuki Abe, Tohoku University Akio Honda, Shizuoka Institute of Science and Technology; Motoaki Sugiura, Tohoku University
EMOTION & SOCIAL: Other

B25 - Inter-brain neural coupling for cooperation and competition in a motion-sensing sports game: an fNIRS hyperscanning study
Haoyu Zhang, Tsinghua University, Huashuo Liu, Tsinghua University; Zhuoran Li, Tsinghua University Dan Zhang, Tsinghua University
EMOTION & SOCIAL: Other

B26 - There?s more to ASD than theory of mind - neural activity associated with processing communicative interactions from point light motion in neurodivergent and typically developing groups
Malgorzata Krawczyk, Polish Academy of Sciences, Institute of Psychology, ?ukasz Okruszek, Institute of Psychology, Polish Academy of Sciences
EMOTION & SOCIAL: Other

B27 - The Effect of Default Mode Network Transcranial Direct Current Stimulation on Open-Minded Cognition
Chad Osteen, Loyola University Chicago, Nicolle Leon-Araujo, Loyola University Chicago; Chinedum Ekeh, Loyola University Chicago Calior Bestwick, Loyola University Chicago; DJ Capetillo, Loyola University Chicago; Sydney Samoska, Loyola University Chicago; Robert G Morrison, Loyola University Chicago
EMOTION & SOCIAL: Other

B28 - Effects of Transcranial Direct Current Stimulation (tDCS) and Social Manipulation on Pain Response
Amin Dehghani, Dartmouth College, Carmen Bango, Dartmouth College; Tor D. Wager, Dartmouth College
EMOTION & SOCIAL: Other

B29 - Neuroanatomical bases of self-identity formulation: results of a voxel-based morphometry study in a large sample of healthy young adults
Mamiko Yamazaki, Tohoku University, Rui Nouchi, Tohoku University; Hikaru Takeuchi, Tohoku University Takamitsu Shinada, Tohoku University; Ryoichi Yokoyama, Kobe University; Yuka Kotozaki, Fukushima Medical University School of Medicine; Seishu Nakagawa, Tohoku University; Sugiko Hanawa, Tohoku University; Atsushi Sekiguchi, National Institute of Mental Health; Carlos Miyauchi, Tohoku University; Kohei Sakaki, Tohoku University; Kelssy Kawata, Tohoku University; Ryuta Kawashima, Tohoku University, Takayuki Nozawa, Toyama University, Susumu Yokota, Kyushu University
EMOTION & SOCIAL: Self perception

B30 - The teacher's mind: executive functions and mentalizing skills in expert teachers and adult non-teachers.
Paulo Barraza, CIAE Universidad de Chile, Eugenio Rodriguez, Pontificia Universidad Cat—lica de Chile
EMOTION & SOCIAL: Emotion-cognition interactions

B31 - An event-related potential investigation of the relation between depressive symptoms and future-oriented self-knowledge
Kristina Munelith-Souksanh, University of Ottawa, Annick Tanguay, University of Ottawa; Galit Karpov, Rutgers University Ann-Kathrin Johnen, Birmingham City University; Louis Renoult, University of East Anglia; Patrick Davidson, University of Ottawa
EMOTION & SOCIAL: Self perception

B32 - Where is Wally and How Quickly Do We Know It? Fixation-related Electrical Potentials during a Free Visual Exploration Task Reveal the Timing of Visual Awareness
Zeguo Qui, The University of Queensland, Hongfeng Xia, The University of Queensland; Stefanie I. Becker, The University of Queensland; Zachary Hamblin-Frohman, The University of Queensland; Alan J. Pegna, The University of Queensland
EMOTION & SOCIAL: Emotion-cognition interactions

B33 - The progression of adult hippocampal neurogenesis in Alzheimer's disease mice.
Thomas Kim, Stony Brook University, Michelle Syty, Stony Brook University; Faye Wang, Stony Brook University Shaoyu Ge, Stony Brook University
EXECUTIVE PROCESSES: Development &aging

B34 - A Combined Computational Modelling and Brain Imaging Study of Visual Attention, Decision Making and Inhibitory Control in Adolescence
Imogen Stead, The University of Queensland, Mariam Omar, The University of Queensland; Annemaree Carroll, The University of Queensland Dragan Rangelov, The University of Queensland; Jason Mattingley, The University of Queensland
EXECUTIVE PROCESSES: Development &aging

B35 - Hippocampal Subfield Volume & Cognitive Function in Older Adults with Prediabetes
Jennifer Hanna Al-Shaikh, University of Western Ontario, Olivia Ghosh-Swaby, University of Western Ontario; Ali Khan, University of Western Ontario Jane Thornton, University of Western Ontario; Lindsay Nagamatsu, University of Western Ontario
EXECUTIVE PROCESSES: Development &aging

B36 - Causal Inference in Dementia Prevention Using Data from the Canadian Longitudinal Study on Aging *In Progress
Vicky Chang, University of Western Ontario, Abolfazl Avan, Mashhad University of Medical Sciences; Mark Daley, University of Western Ontario Vladimir Hachinski, University of Western Ontario
EXECUTIVE PROCESSES: Development &aging

B37 - At-home neuromodulation to facilitate cognitive control in older adults with mild cognitive impairment
Kevin Jones, University of California San Francisco, Avery Ostrand, University of California San Francisco; Adam Gazzaley, University of California San Francisco Theodore Zanto, University of California San Francisco
EXECUTIVE PROCESSES: Development &aging

B38 - Regional brain volumetric analysis in diverse racial groups: Age and depression interactions on executive processes
Zhimei Niu, University of Texas in Austin, Andreana Haley, University of Texas in Austin; Alexandra Clark, University of Texas in Austin Audrey Duarte, University of Texas in Austin
EXECUTIVE PROCESSES: Development &aging

B39 - Mixed ginger (Zingiber officinale) and garlic (Allium sativum) juice attenuates hippocampal astrocytic response and other markers of hippocampal function in lead-induced Wistar rats.
Kenneth Oparaji, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria, Azubuike Nwaji, Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine,
Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria; Blessing Anyaoha, Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine,
Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria; Williams Ibegbunam, Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine,
Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria; Chijiuwa Onyemauchechukwu, Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine,
Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria; Promise Nwachukwu, Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine,
Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), Nigeria; Ejeatuluchukwu Obi, Department of Pharmacology and Therapeutics, College of Health Sciences, Nnamdi
Azikiwe University (NAU) Nnewi Campus, Anambra State, Nigeria.; Omamuyovwi Ijomone, Department of Human Anatomy, School of Basic Medical Sciences, Federal
University of Technology Akure (FUTA), Ondo State, Nigeria
EXECUTIVE PROCESSES: Other

B40 - The effect of practice on task-set inertia and neural task set representations in EEG
Brandon Watanabe, Texas A&M University, Hanan Guzman, Texas A&M University; Michael Imburgio, Texas A&M University Joseph Orr, Texas A&M University
EXECUTIVE PROCESSES: Goal maintenance & switching

B41 - Cognitive effort affects the strategic level of task-processing during cued task-switching
Stefan Arnau, IfADo, Nathalie Liegel, IfADo; Edmund Wascher, IfADo
EXECUTIVE PROCESSES: Goal maintenance & switching

B42 - The Role of Reward in Voluntary Task-Switching: Evidence from Eye tracking & EEG
Juan Balcazar, Texas A&M, Joseph Orr, Texas A&M University
EXECUTIVE PROCESSES: Goal maintenance & switching

B43 - The role of Reward Expectancy in guiding Cognitive Flexibility
Beatrice Lomeo, Texas A&M University, Daniela Porro, Texas A&M University; Joseph Orr, Texas A&M University
EXECUTIVE PROCESSES: Goal maintenance & switching

B44 - The effect of practice on task-set inertia and neural task set representations in fMRI
Hanan Guzman, Texas A&M University, Brandon Watanabe, Texas A&M University; Michael Imburgio, Texas A&M University Joseph Orr, Texas A&M University
EXECUTIVE PROCESSES: Goal maintenance & switching

B45 - Altered Associations between Task Ability and Dorsolateral Prefrontal Activation during a Cognitive Control Task in Schizophrenia
Jason Smucny, University of California Davis, Tim Hanks, University of California Davis; Tyler Lesh, University of California Davis Randy O'Reilly, University of California Davis; Cameron Carter, University of California Davis
EXECUTIVE PROCESSES: Goal maintenance & switching

B46 - Task sequences are flexibly encoded as sequential and associative memory
Guochun Yang, University of Iowa, Jiefeng Jiang, University of Iowa
EXECUTIVE PROCESSES: Goal maintenance & switching

B47 - Cerebral blood flow and executive function changes in response to active and passive exercise
Alma Rahimidarabad, University of Western Ontario, Azar Ayaz, University of Western Ontario; Lian Buwadi, University of Western Ontario Gianna Jeyarajan, University of Western Ontario; Matthew Heath, University of Western Ontario
EXECUTIVE PROCESSES: Goal maintenance & switching

B48 - Altered task-induced activity and functional connectivity in the frontocingulate cortex as a marker of depression and treatment response
Christine A. Leonards, Melbourne Neuropsychiatry Centre, Ben J. Harrison, Melbourne Neuropsychiatry Centre, The University of Melbourne, Parkville,Victoria, Australia; Alec J. Jamieson, Melbourne Neuropsychiatry Centre, The University of Melbourne, Parkville,Victoria, Australia; Trevor Steward, Melbourne Neuropsychiatry Centre, The University of Melbourne, Parkville,Victoria, Australia; Christopher G. Davey, The University of Melbourne, Parkville, Victoria, Australia
EXECUTIVE PROCESSES: Goal maintenance & switching

B49 - Visual recognition memory of complex scenes is driven by high-level, but not by low-level, visual representations
Ricardo Morales-Torres, Duke University, Erik Wing, Rotman Research Institute; Lifu Deng, Duke University Simon Davis, Duke University; Roberto Cabeza, Duke University
LONG-TERM MEMORY: Episodic

B50 - Long-term, multi-event surprise enhances real-world memory
James Antony, Cal Poly, SLO, Jacob van Dam, Cal Poly, SLO; Alexander Barnett, University of Toronto Kelly Bennion, Cal Poly, SLO
LONG-TERM MEMORY: Episodic

B51 - Is false recognition in aging due to an emphasis on semantic information at encoding? An fMRI study
Loris Naspi, Humboldt University of Berlin, Paola Gega, Humboldt University of Berlin; Roberto Cabeza, Duke University
LONG-TERM MEMORY: Episodic

B52 - Hippocampal interactions with visual and semantic representations in the cortex support subsequent perceptual and conceptual memory
Shenyang Huang, Duke University, Cortney M. Howard, Duke University; Mariam Hovhannisyan, The University of Arizona Roberto Cabeza, Duke University; Simon W. Davis, Duke University
LONG-TERM MEMORY: Episodic

B53 - The role of attentional selection in goal-directed episodic memory reactivation
Melinda Sabo, Leibniz Research Centre for Working Environment and Human Fa, Daniel Schneider, Leibniz Research Centre for Working Environment and Human Fa
LONG-TERM MEMORY: Episodic

B54 - Scene Selective Regions In The Medial Temporal Lobe Are Also Recruited For Non-Scene Specific Integration Across Episodes
Lydia Jiang, University of Toronto; Rotman Research Institute at Baycrest, Mrinmayi Kulkarni, Rotman Research Institute at Baycrest; Jessica Robin, Rotman Research Institute at Baycrest Anika Choi, University of Toronto; Rotman Research Institute at Baycrest; Bradley Buchsbaum, Rotman Research Institute at Baycrest; Rosanna Olsen, Rotman Research Institute at Baycrest
LONG-TERM MEMORY: Episodic

B55 - Neural similarity of schematic information overrides new information, irrespective of target or lure information.
Catherine Carpenter, The Pennsylvania State University, Nancy Dennis, The Pennsylvania State University
LONG-TERM MEMORY: Episodic

B56 - Post-encoding replay during awake rest promotes memory integration across overlapping sequences
Arlene Lormestoire, Columbia University, Alexa Tompary, University of Pennsylvania; Lila Davachi, Columbia University
LONG-TERM MEMORY: Episodic

B57 - Automated Scoring of the Autobiographical Interview with Natural Language Processing
Ruben Van Genugten, Northeastern University, Daniel Schacter, Harvard University
LONG-TERM MEMORY: Episodic

B58 - Linguistic cues of memory accuracy differ for low-threat and high-threat memories.
Steven Martinez, Temple University, Katelyn Cliver, Temple University; William Mitchell, Temple University Helen Schmidt, Temple University; Chelsea Helion, Temple University; Jason Chein, Temple University; Vishnu Murty, Temple University
LONG-TERM MEMORY: Episodic

B59 - Hippocampal differentiation and visual cortex anticipation resolve competition during memory-guided attention
Serra Favila, Columbia University, Mariam Aly, Columbia University
LONG-TERM MEMORY: Episodic

B60 - Effects of aging, neurodegenerative disease, and MTL damage on autobiographical memory recall: A meta-analytic review of the Autobiographical Interview
Stephanie Simpson, University of Toronto; Rotman Research Institute at Baycrest, Mona Eskandaripour, Rotman Research Institute at Baycrest; Brian Levine, University of Toronto; Rotman Research Institute at Baycrest
LONG-TERM MEMORY: Episodic

B61 - Episodic-Semantic Linkage for $1000: Episodic memory bolsters acquisition of new semantic knowledge in trivia experts
Monica Thieu, Emory University, Lauren Wilkins, Princeton University; Mariam Aly, Columbia University
LONG-TERM MEMORY: Episodic

B62 - Switching between external and internal attention in hippocampal networks
Craig Poskanzer, Columbia University, Mariam Aly, Columbia University
LONG-TERM MEMORY: Episodic

B63 - Tracking the neural representations of trauma-analogue experiences from encoding to memory intrusions
Malte Kobelt, Ruhr-University Bochum, Gerd Waldhauser, Ruhr-University Bochum; Aleksandra Rupietta, Ruhr-University Bochum Rebekka Heinen, Ruhr-University Bochum; Henrik Kessler, Fulda Clinic; Nikolai Axmacher, Ruhr-University Bochum
LONG-TERM MEMORY: Episodic

B64 - Hippocampo-cortical replay during rest shapes memory updating
John Thorp, Columbia University, Alyssa Sinclair, Duke University; Morgan Barense, University of Toronto R Alison Adcock, Duke University; Lila Davachi, Columbia University
LONG-TERM MEMORY: Episodic

B65 - Dorsomedial Prefrontal Cortex (DMPFC) Prioritizes Social Learning at Rest
Courtney Jimenez, Dartmouth College, Meghan Meyer, Columbia University
LONG-TERM MEMORY: Episodic

B66 - The role of the Angular Gyrus in episodic recognition, familiarity, and the subjective experience of recollection
Andreea Zaman, King's College London, Ruby Morton, King's College London; Lauren White, King's College London Paige Seath, King's College London; Caroline Catmur, King's College London; Mihaela Zaman, King's College London
LONG-TERM MEMORY: Episodic

B67 - Valence biases in reinforcement learning and autobiographical memory
Susan Benear, New York University, Michael Evans, First Place for Youth; Gail Rosenbaum, Geisinger Health Catherin Hartley, New York University
LONG-TERM MEMORY: Episodic

B68 - Event Segmentation from Working Memory Dynamics in the Absence of Prediction Error
Sunjae Shim, Stanford University, Franck Mugisho, Columbia University; Christopher Baldassano, Columbia University; Lila Davachi, Columbia University
LONG-TERM MEMORY: Episodic

B69 - Reap while you sleep: consolidation of memories differs by how they were sown
Eitan Schechtman, University of California Irvine, James W Antony, California Polytechnic State University
LONG-TERM MEMORY: Episodic

B71 - Investigating fluctuations of sustained attention and their effects on memory
Eva Gjorgieva, Duke University, Tobias Egner, Duke University; Marty Woldorff, Duke University; Roberto Cabeza, Duke University
LONG-TERM MEMORY: Episodic

B72 - Theta-Gamma Phase-Amplitude Coupling During Sequence Memory Encoding in Healthy Older Adults
Nina Ehrhardt, University Medicine Greifswald, Guglielmo Lucchese, University Medicine Greifswald; Agnes Flöel, University Medicine Greifswald; Daria Antonenko, University Medicine Greifswald
LONG-TERM MEMORY: Episodic

B73 - Reduced Episodic Recollection Does Not Correspond to Reduced Cortical Thickness
Andreja Stajduhar, University of Toronto, Devin Sodums, Rotman Research Institute; Brian Levine, University of Toronto
LONG-TERM MEMORY: Episodic

B74 - Theta oscillations in the human temporal lobe change at event boundaries during real-world navigation
Cory Inman, University of Utah, Luis Garcia, University of Southern California; Uros Topalovic, UCLA; Mauricio Vallejo Martelo, UCLA; Matthias Stangl, UCLA; Tyler Davis, University of Utah; Martina Hollearn, University of Utah; Justin Campbell, University of Utah; Lensky Augustin, University of Utah; Dawn Eliashiv, UCLA; Nick Hasulak, Phoenix Research Consulting; Sonja Hiller, UCLA; Nanthia Suthana, UCLA
LONG-TERM MEMORY: Other

B75 - Cognitive tutoring induces distinct patterns of changes in neural representations in children with and without mathematical difficulties.
Yunji Park, Stanford University, Hyesang Chang, Stanford University; Yuan Zhang, Stanford University; Flora Schwartz, Stanford University; Teresa Iuculano, Centre National de la Recherche Scientifique; Vinod Menon, Stanford University
LONG-TERM MEMORY: Skill Learning

B76 - The retrieval stopping model of fear extinction: A meta-analysis of fMRI studies
Molly Rowlands, University of Cambridge, Michael Anderson, University of Cambridge
LONG-TERM MEMORY: Episodic

B77 - Behavioral and Eye Gaze Patterns in Political Decision Making
Shahd Fares, McGill University, Dietlind Stolle, McGill University; Signy Sheldon, McGill University Lesley Fellows, McGill University
THINKING: Decision making

B78 - Resting-State Functional Connectivity as a Predictor for Shifting Memory-Based Decision Criterion
Courtney Durdle, University of California, Santa Barbara, Sara Leslie, University of California, Santa Barbara; Evan Layher, University of California, Santa Barbara Kaitlyn Deen, University of California, Santa Barbara; Jessica Simonson, University of California, Santa Barbara; Luna Li, University of California, Santa Barbara; Miguel Eckstein, University of California, Santa Barbara; Michael Miller, University of California, Santa Barbara
THINKING: Decision making

B79 - Identifying Distinct and Shared Neural Activity Associated with Adaptive Decision-Making and Metacognition
Sara Leslie, UCSB, Courtney Durdle, UCSB; Patrick Sweeney, UCSB Joyce He, UCSD; Kaitlyn Deen, UCSB; Jessica Simonson, UCSB; Michael Miller, UCSB
THINKING: Decision making

B80 - Title: Shifting Expectations: Criterion shift association of Electroencephalography, in a recognition memory security patrol paradigm.
Christina Boardman, University of California Santa Barbara, Evan Layher, University of California Santa Barbara; Jean Vattel, Army Futures Command Michael Miller, University of California Santa Barbara. *THINKING: Decision making*

B81 - Fixed or stochastic? Testing the stochasticity of reference dependency in human decision making
Chih-Yin Lu, National Yang Ming Chiao Tung University, Shih-Wei Wu, National Yang Ming Chiao Tung University
THINKING: Decision making

B82 - Computational modeling of value-based learning among individuals with Attention-Deficit/Hyperactivity Disorder
Gili Katabi, Tel-Aviv University, Gili Katabi, Tel-Aviv University; Nitzan Shahar, Tel-Aviv University
THINKING: Decision making

B83 - Uncertainty-based and heuristic exploration is supported by distinct but interacting neural substrates
Alexander Paunov, NeuroSpin, Dalin Guo, University of California San Diego; Ma'va L'H™tellier, NeuroSpin Zoe He, University of California San Diego; Angela Yu, University of California San Diego; Florent Meyniel, NeuroSpin
THINKING: Decision making

B84 - Behavioral approach is linked to increased neural communication between frontostriatal and insular regions under risk.
Siraj Lyons, University of Louisville, Brendan Depue, University of Louisville
THINKING: Decision making

B85 - The Brain Seeks Novelty to Perpetuate Stability
Jing-Yu Chuang, National Taiwan University, Joshua Oon Soo Goh, National Taiwan University
THINKING: Decision making

B86 - Brain signatures during perceptual decision-making index variations in internal processing and decision boundary
Johan Nakuci, Georgia Institute of Technology, Jason Samaha, University of California Santa Crus; Dobromir Rahnev, Georgia Institute of Technology
THINKING: Decision making

B87 - BEHAVIORAL AND ELECTROPHYSIOLOGICAL EVIDENCE OF MOMENT-TO-MOMENT CHANGES IN EXPECTATIONS
Deborah Marciano, University of California, Berkeley, Ludovic Bellier, University of California, Berkeley; Ida Mayer, University of California, Berkeley Ming Hsu, University of California, Berkeley; Robert T. Knight, University of California, Berkeley
THINKING: Decision making

B88 - Strategic and Implicitly Reinforced Criterion Shifting in Recognition Memory: An Individual Differences Perspective
Luna Li, University of California, Santa Barbara, Evan Layher, University of California, Santa Barbara; Michael Miller, University of California, Santa Barbara
THINKING: Decision making

B89 - A neuro-temporal decoding investigation of multi-attribute decision making
Matthew Bachman, University of Toronto, Azadeh HajiHosseini, University of Toronto; Sophie Faessen, University of Toronto Cendri Hutcherson, University of Toronto
THINKING: Decision making

B90 - Now you see them, now you don't: Developmental reversals in a classic memory game
Samantha Gualtieri, University of Toronto, Amy Finn, University of Toronto
THINKING: Development & aging

B91 - Honey, you're thinking too much: An investigation into sex differences in Subjective Cognitive Decline
Jillian Graham, Belmont University, Cassandra Morrison, McConnell Brain Imaging Centre, Montreal Neurological Inst.; Michael Oliver, Belmont University
THINKING: Development & aging

B92 - Can your past predict your future behaviors? Investigating the Impact of Childhood Experiences.
Savannah Campbell, Belmont University, Molly Georgas, Belmont University; Arwen Rolinitis, Belmont University Michael Oliver, Belmont University; Carole Scherling, Belmont University
THINKING: Development & aging

B93 - Developmental differences in functional organization of multispectral connectivity
Nathan Petro, Boys Town National Research Hospital, Giorgia Picci, Boys Town National Research Hospital; Christine Embury, Boys Town National Research Hospital Lauren Ott, University of California - San Diego; Samantha Penhale, University of Florida; Maggie Rempe, Boys Town National Research Hospital; Yu-Ping Wang, Tulane University; Julia Stephens, Mind Research Network; Vince Calhoun, Georgia State University; Gaelle Doucet, Boys Town National Research Hospital; Tony Wilson, Boys Town National Research Hospital
THINKING: Development & aging

B94 - Healthy aging impacts the construction but not the elaboration of social prospective thoughts
Gaelle Doucet, Boys Town National Research Hospital, Jordanna Kruse, Boys Town National Research Hospital; Katrina Myers, Boys Town National Research Hospital Noah Hamlin, Boys Town National Research Hospital; Joanna Arch, University of Colorado Boulder; Jessica Andrews-Hanna, University of Arizona
THINKING: Development & aging

B95 - Do strokes affect the brain?s critical state? A theoretical perspective.
Jacek Grela, Jagiellonian University, Jakub Janarek, Jagiellonian University; Zbigniew Drogosz, Jagiellonian University Jeremi K. Ochab, Jagiellonian University; Pawel Oswiecimka, nstitute of Nuclear Physics Polish Academy of Sciences; Maciej A. Nowak, Jagiellonian University; Dante R. Chialvo, Universidad Nacional de San Mart?n
THINKING: Other

B96 - Neural substrates of loss: Comparing with the amount of financial losses
Masayo Noda, Kinjo Gakuin University, Hiroki Tanabe, Nagoya University; Ayumi Yoshioka, National Institute for Physiological Sciences Masato Kimura, KONICA MINOLTA, INC
THINKING: Other

B97 - Cultural differences in resting-state functional connectivity of East Asian and Western brains
Lin-han Huang, National Taiwan University, Isu Cho, Brandeis University; Angela Gutchess, Brandeis University Joshua Oon Soo Goh, National Taiwan University
THINKING: Other

B98 - Evidence for Crossmodal Translation of Complex Ideas in Left Lateral Posterior Temporal Cortex
Dillon Plunkett, Harvard University; Northeastern University, Joshua Greene, Harvard University
THINKING: Other

B99 - Experimentally inducing dream content during REM sleep to promote creative problem-solving
Karen R. Konkoly, Northwestern University, Daniel Morris, Northwestern University; Remington Mallett, Northwestern University Ken A. Paller, Northwestern University
THINKING: Problem solving

B100 - Excitatory transcranial direct current stimulation (tDCS) over the left dorsolateral prefrontal cortex (DLPFC) has been
Simone Luchini, The Pennsylvania State University, Roger Beaty, The Pennsylvania State University; Yangping Li, Shaanxi Normal University Hannah Merseal, The Pennsylvania State University
THINKING: Problem solving

B101 - Neural Correlates of Learning Preferences and Individual Differences in Design Fixation:
Preliminary Evidence from Functional Magnetic Resonance Imaging (fMRI)

Dong Ho Kim, Drexel University, Julie Milovanovic, University of North Carolina at Charlotte; Rosiejo Genzola, Drexel University Maddie Navea, Drexel University; John Gero, University of North Carolina at Charlotte; Evangelia G. Chrysikou, Drexel University
THINKING: Problem solving

B102 - Collaborative Tasks And Intersubject Correlation: A Naturalistic Hyperscanning Paradigm Using AR Tangram and Muse EEG
Valerie Klein, University of California Davis, Xuanjun (Jason) Gong, University of California Davis; Michael Andrews, University of California Davis William Weisman, University of California Davis; Richard Huskey, University of California Davis; Jorge Pe–a, University of California Davis; Sophia Sarieva, University of California Davis; Raymond Kang, University of California Davis; Ralf SchmŠlzle, Michigan State University; Jeffrey T. Hancock, Stanford
THINKING: Problem solving

B103 - Neurodevelopmental maturation of mathematical literacy
Ting-Ting Chang, National Chengchi University, Chantat Ng, National Chengchi University
THINKING: Problem solving

B104 - Effects of HD-tDCS Over Prefrontal and Parietal Cortex for Creative Thinking in a Real-World Object Use Task
Evie Touring, Drexel University, Taylor J. Orsini, Drexel University; Kent Hubert, University of Arkansas Maria Mukhanova, Columbia University; Evangelia G. Chrysikou, Drexel University
THINKING: Problem solving

Poster Session C

Sunday, March 26, 5:00 pm - 7:00 pm, Pacific Concourse

C1 - The effect of voluntary attentional control on emotional reactions to sound in people with and without misophonia
Marie-Anick Savard, Concordia University, Mickael L.D. Deroche, Concordia University; Emily B.J. Coffey, Concordia University
ATTENTION: Auditory

C2 - Attentional modulation of spatiotemporal neural signatures during audiovisual speech processing
Patrik Wikman, University of Helsinki, Viljami Salmela, University of Helsinki; Miika Leminen, Helsinki University Hospital Matti Laine, Åbo Akademi University; Kimmo Alho, University of Helsink
ATTENTION: Auditory

C3 - Bottom-Up and Top-Down Processes Underlying LC-NA System Activity Revealed by Simultaneous Pupillometry and EEG
Grace M. Desmond, Brown University, Romy Fršmer, Brown University; Mingjian He, Massachusetts Institute of Technology Isaac Y. Kim, Brown University; William C. Heindel, Brown University; Elena K. Festa, Brown University
ATTENTION: Auditory

C4 - Aging modulates the impact of cognitive interference subtypes on dynamic connectivity within a distributed motor network
Yasra Arif, Boys Town National Research Hospital, Hannah Okelberry, Boys Town National Research hospital; Hallie Johnson, Boys Town National Research Hospital Madelyn Willett, Boys Town National Research Hospital; Alex Wiesman, McGill University; Tony Wilson, Boys Town National Research Hospital
ATTENTION: Development & aging

C5 - Differential effects of music on attention in aging adults
Schea Fissel Brannick, Midwestern University, Nicholas Dovorany, Midwestern University; Arianna LaCroix, Purdue University
ATTENTION: Development & aging

C6 - Influence of Aging and Cognitive Load on Alpha-band Oscillation
Catherine Reed, Claremont McKenna College, Heather Shipley, Claremont McKenna College; Chandlyr Denaro, Claremont McKenna College Alison Harris, Claremont McKenna College; Alan Hartley, Claremont McKenna College
ATTENTION: Development & aging

C7 - Neural correlates underlying local and global processing during visual search across adulthood
Nicolas Poirel, UniversitŽ de Paris, GIP Cyceron, Institut Universitaire de France, Gaelle E. Doucet, Boys Town National Research Hospital, Creighton University School of Medicine; Jordanna A. Krusce, Boys Town National Research Hospital; Noah Hamlin, Boys Town National Research Hospital; Carole Peyrin, Univ. Grenoble Alpes, Univ. Savoie Mont Blanc;
ATTENTION: Development & aging

C8 - Age-Related Differences in the Relationship Between the Basal Forebrain Volume, Functional Connectivity, and Cognition
Miriam Taza, McGill University, Taylor W. Schmitz, University of Western Ontario; Roni Setton, Harvard University Laetitia Mwilambwe-Tshilobo, McGill University; Gary R. Turner, York University; R. Nathan Spreng, McGill University
ATTENTION: Development & aging

C9 - Whole-Brain Background Functional Connectivity Tracks Individual Components of Divided Attention
Y.Peeta Li, University of Oregon, J.Benjamin Hutchinson, University of Oregon
ATTENTION: Multisensory

C10 - Search efficiency scales with semantic relatedness in audiovisual contexts
Kira Wegner-Clemens, George Washington University, George Malcolm, University of East Anglia; Sarah Shomstein, George Washington University
ATTENTION: Multisensory

C11 - Steady-State EEG Measures How Directed Attention Impacts Audiovisual Integration of Letters and Speech Sounds
Lindsey Hasak, Stanford University, Blair Kaneshiro, Stanford University; Trang Nguyen Grant, Stanford University Fang Wang, Stanford University; Alexandra Yakovleva, Stanford University; Vladimir Vildavski, Stanford University; Anthony Norcia, Stanford University; Bruce McCandliss, Stanford University
ATTENTION: Multisensory

C12 - The allocation of attention in a tactile search task: the impact of set-size on the N140cc
Elena Gherri, University of Bologna, Fabiola Rosaria Fiorino, University of Modena and Reggio Emilia; Cristina Iani, University of Modena and Reggio Emilia Sandro Rubichi, University of Modena and Reggio Emilia
ATTENTION: Other

C13 - How Internal Attention Impacts Learning from Online Lectures
Ido Davidesco, University of Connecticut, Sarah Gilmore, University of Connecticut; Charles Wasserman, University of Connecticut Kristin Simmers, University of Connecticut; Vaishnavi Sivaprasad, University of Connecticut
ATTENTION: Other

C14 - Dissociating Sources of Sustained Attention Failures via Reward
Henri Etel Skinner, University of California, Santa Barbara, Riddhima Chandra, University of California, Santa Barbara; Barry Giesbrecht, University of California, Santa Barbara
ATTENTION: Other

C15 - A little lapse (in attention) goes a long way: categorizing novel stimuli benefits from sustained attention failures
Johnny Dubois, University of Toronto, Marlie Tandoc, University of Pennsylvania; Amy Finn, University of Toronto
ATTENTION: Other

C16 - Incidental Exposure Optimizes Attention to Features that are Relevant to Category Membership
Noah Reardon, The Ohio State University, Layla Unger, The Ohio State University; Vladimir Sloutsky, The Ohio State University
ATTENTION: Other

C17 - Does spatial attention operate rhythmically? No evidence for behavioral oscillations in detection criterion or sensitivity.
Jason Samaha, University of California, Santa Cruz,
ATTENTION: Spatial

C18 - Attentional Modulation of Functional Lateralization Biases with Verbal and Nonverbal Stimuli
Grace Wang, University of Toronto, Jed Meltzer, University of Toronto
ATTENTION: Spatial

C19 - The time to shift attention is influenced by the number of shifts made
Marcia Grabowecky, Northwestern University, Patrick Zacher, Northwestern University
ATTENTION: Spatial

C20 - Spatial and feature-selective attention interact to drive selective coding in frontoparietal cortex: data from healthy controls and focal lesion patients
Nadene Dermody, University of Cambridge, Romy Lorenz, University of Cambridge; John Duncan, University of Cambridge Alexandra Woolgar, University of Cambridge
ATTENTION: Spatial

C21 - EEG indices of selective attention predict the quality of cortical object representation: a concurrent EEG-fMRI study
David Acunzo, University of Birmingham, Damiano Grignolio, University of Birmingham; Clayton Hickey, University of Birmingham
ATTENTION: Spatial

C22 - Elucidating the role of subthalamic nucleus in the inhibitory control of attentional and perceptual representations
Cheol Soh, University of Iowa, Cathleen Moore, University of Iowa; Nathan Chalkley, Universityof Iowa Jan Wessel, University of Iowa
ATTENTION: Spatial

C23 - Early differential and later similar effects between exogenous and endogenous attention facilitate perception during visual processing
Mathieu Landry, Universite de Montreal, Jason Da Silva Castanheira, McGill University; karim Jerbi, Universite de Montreal
ATTENTION: Spatial

C24 - Uncertainty modulates task-irrelevant object representations in human early visual cortex
Xiaoli Zhang, The George Washington University, Andrew J. Collegio, The George Washington University; Dwight J. Kravitz, The George Washington University Sarah Shomstein, The George Washington University
ATTENTION: Spatial

C25 - The effects of divided attention on long-term memory retrieval
Nursima Ê†nver, Sabancõ University, Istanbul, Turkey; University of Toronto, Toronto, Canada, Eren GŸnseli, Sabancõ University, Istanbul, Turkey
ATTENTION: Spatial, LONG-TERM MEMORY: Episodic

C26 - Language variations on Deaf and Hard of Hearing Individuals's Executive Processing
Chase Martin, NTID Research Center on Culture and Language,
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C27 - Stimulus-Elicited Involuntary Cognitions: Response Conflict, Habituation, and Word-Frequency Effects
Natalia Wieczorek, San Francisco State University, Sarah Brauer, San Francisco State Univeristy; Jamie Bueno, San Francisco State University Ezequiel Morsella, San Francisco State University; Zaviera Panlilio, University at Buffalo; Anthony Velasquez, San Francisco State Univeristy
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C28 - Emotional Interference in Inhibitory Control among Violent Offenders
Chia-Chuan Yu, The University of Texas at Austin, Suyen Liu, National Chung Cheng University; Darla Castelli, The University of Texas at Austin
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C29 - Improved inhibitory-control performance by out-of-phase transcranial alternating current stimulation between dorsolateral prefrontal and anterior cingulate cortices
Byoung-Kyong Min, Korea University, Yukyung Kim, Korea University; Jeongwook Kwon, Korea University Je-Hyeop Lee, Korea University; Je-Choon Park, Korea University; Hyoungkyu Kim, Korea University; Jeehye Seo, Korea University
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C30 - Monitoring: tracing the evolutionary link from movement to cognition
Lydia Dorokhova, Aix Marseille University, Kep Kee Loh, McGill University; Jean-Luc Anton, Aix Marseille University Julien Sein, Aix Marseille University; Bruno Nazarian, Aix Marseille University; Pascal Belin, Aix Marseille University; Elin Runnqvist, Aix Marseille University
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C31 - Cerebral blood flow velocity and postexercise executive function benefits in nicotine vaping (In-Progress)
Lauren Giuffre, Western University, Gianna Jeyarajan, Western University; Chloe Edgar, Western University Samantha Marshall, Western University; Azar Ayaz, Western University; Matthew Heath, Western University
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C32 - Association between resting-state fMRI and inhibitory control among psychosis patients and healthy populations
Zhennuo Wu, University of Chicago, Shashwath Meda, Hartford Hospital; Carol Tamminga, UT Southwestern Brett Clementz, University of Georgia; Matcheri Keshavan, Harvard University; Godfrey Pearlson, Yale University; Elliot Gershon, University of Chicago; Sarah Keedy, University of Chicago
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C33 - Interrelationship Between Impulsivity, Error-Related Negativity (ERN) and a Behavioral Flanker Task: An Event-Related Potential Investigation
Folly Folivi, Mt. Holyoke College, Catherine Reed, Claremont McKenna College; Cindy Bukach, University of Richmond Jane Couperus, Mt. Holyoke College
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C34 - Brain stimulation at home: The effects of remote brain stimulation on memory and metamemory monitoring.
Casey Imperio, CUNY: The graduate center, Elizabeth Chua, Brooklyn College
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C35 - Cerebral Hemodynamics During the Preparatory Phase of an Antisaccade Following Acute Aerobic Exercise
Gianna Jeyarajan, University of Western Ontario, Lindsay Nagamatsu, University of Western Ontario; Matthew Heath, University of Western Ontario
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C36 - Conditions of Control: Investigating the effect of individual differences in ADHD symptoms on efficacy of tDCS for improving inhibitory control
Athena May, University of Connecticut, Lauren Miller, University of Connecticut; Hannah Morrow, University of Connecticut Eiling Yee, University of Connecticut
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C37 - Cortical Hemodynamic and Executive Function Changes Linked to Combined Exercise and Meditation Training
Lian Buwadi, University of Western Ontario, Azar Ayaz, University of Western Ontario; Alma Darabad, University of Western Ontario Gianna Jeyarajan, University of Western Ontario; Matthew Heath, University of Western Ontario
EXECUTIVE PROCESSES: Monitoring & inhibitory control

C38 - Decoding integration and generalization of hierarchical task representation.
WooTek Lee, University of Iowa, Jiefeng Jiang, University of Iowa; Eliot Hazeltine, University of Iowa
EXECUTIVE PROCESSES: Goal maintenance & switching

C39 - Task structure shapes the geometry of control representations in PFC
Haley Keglovits, Brown University, Apoorva Bhandari, Brown University; Emily Chicklis, Brown University; David Badre, Brown University
EXECUTIVE PROCESSES: Goal maintenance & switching

C40 - Distinct EEG markers of higher-level rule selection and lower-level response selection in a hierarchical cognitive control task
Isaac Y. Kim, Brown University, Elena K. Festa, Brown University; Grace M. Desmond, Brown University; Mingjian He, Massachusetts Institute of Technology; William C. Heindel, Brown University; Romy Frömer, Brown University
EXECUTIVE PROCESSES: Goal maintenance & switching

C41 - Enhanced Attentional Control during Stroop Task Performance: a tDCS Study
Nathan Caines, University of California Santa Cruz, Megan Boudewyn, university of California Santa Cruz; Cameron Carter, university of California Davis
EXECUTIVE PROCESSES: Goal maintenance & switching

C42 - Beta oscillations in task switching (BOTS): Evidence for a clear-out role of sensorimotor beta
Pria Daniel, University of California San Diego, Anastasia Kiyonaga, University of California San Diego
EXECUTIVE PROCESSES: Goal maintenance & switching

C43 - Flexible encoding of working memory representations in human neuronal populations
Rhiannon Cowan, University of Utah, Tyler Davis, University of Utah; Bornali Kundu, University of California, San Francisco; John Rolston, Harvard University; Shervin Rahimpour, University of Utah; Elliot Smith, University of Utah
EXECUTIVE PROCESSES: Goal maintenance & switching

C44 - Conjunctive Control Representations Expressed in a Stable and High-dimensional Representational Geometry Lead to Efficient Action Selection
Atsushi Kikumoto, Brown University, Apoorva Bhandari, Brown University; Kazuhisa Shibata, RIKEN Center of Brain Science; Takahiro Nishio, RIKEN Center of Brain Science; Sara Matsui, RIKEN Center of Brain Science; Saki Homma, RIKEN Center of Brain Science; David Badre, Brown University
EXECUTIVE PROCESSES: Working memory

C45 - Neural system supporting selective gating in working memory
Ziqi Zhao, Brown University, Rachel Ratz-Lubashevsky, Brown University; Michael Frank, Brown University; David Badre, Brown University
EXECUTIVE PROCESSES: Working memory

C46 - Reframing Error Reduces Learning Deficits From Prediction Error in High Anxiety Individuals
Alyssa Guthrie, Duke University, Alyssa Sinclaire, Duke University; Rachael Wright, Duke University; Elizabeth Marsh, Duke University; Gregory Samanez-Larkin, Duke University; R. Alison Adcock, Duke University
EXECUTIVE PROCESSES: Working memory

C47 - Individual differences in executive functions predict neurocognitive differences in discourse processing of narrative versus expository texts
Amanda Martinez-Lincoln, Vanderbilt University, Andrea Burgess, Vanderbilt University; Laurie Cutting, Vanderbilt University
EXECUTIVE PROCESSES: Working memory

C48 - Using Machine-Learning Enhanced Voltammetry to Assess Dopaminergic Signaling During Working Memory Gating & Maintenance
Xavier Celaya, Arizona State University, Alexis Torres, Arizona State University; Samuel McClure, Arizona State University; Gi-Yeul Bae, Arizona State University; Leonardo da Silva Barbosa, Virginia Tech; Terry Lohrenz, Virginia Tech; Thomas Twomey, Virginia Tech; Seth Batten, Virginia Tech; Gene Brewer, Arizona State University; Read Montague, Virginia Tech
EXECUTIVE PROCESSES: Working memory

C49 - Conversational memory in aging
Kaitlin Lord, Vanderbilt University, Annick Tanguay, Vanderbilt University Medical Center; Sharice Clough, Vanderbilt University Medical Center Ryan Miller, Vanderbilt University; Devron Burks, Vanderbilt University; Melissa Duff, Vanderbilt University Medical Center; Sarah Brown-Schmidt, Vanderbilt University
LANGUAGE: Development & aging

C50 - Why do we have such difficulty recalling people?s names as we get older? A neurocognitive hypothesis
Lauren Russell, Georgetown University, Jana Reifegerste, Georgetown University; Michael Ullman, Georgetown University
LANGUAGE: Development & aging

C51 - Domain-Specific Neural Profiles of Statistical Learning of Speech and Tone in Young Children
Tengwen Fan, Louisiana State University, Will Decker, Louisiana State University; Julie Schneider, Louisiana State University
LANGUAGE: Development & aging

C52 - Language and Communication in School-age Children with Cortical and Subcortical Brain Injuries
Philip Lai, University of Nebraska Kearney,
LANGUAGE: Development & aging

C53 - An Information-Theoretic Approach to Language Decline
Mingyu Yuan, UC Berkeley, Mingyu Yuan, UC Berkeley
LANGUAGE: Development & aging

C54 - The effects of intent to learn: the neural response to highly iconic signs in hearing non-signers
Emily M. Akers, San Diego State University, Katherine J. Midgley, San Diego State University; Phillip J. Holcomb, San Diego State University Karen Emmorey, San Diego State University
LANGUAGE: Lexicon

C55 - ERP Masked Priming Effects in Covert Spatial Attention
Jacklyn Jardel, San Diego State University, Jamie Reena, San Diego State University; Emily M Akers, San Diego State University Phillip J Holcomb, San Diego State University
LANGUAGE: Lexicon

C56 - Processing grammatical features in a second language: behavioral and ERP evidence
Niels Schiller, Leiden University, Shaoyu Wang, Leiden University
LANGUAGE: Lexicon

C57 - Perception of Onset Sibilant Variants in Taiwan Mandarin: An ERP Study
Yun-Han Hsu, National Taiwan University, Janice Fon, National Taiwan University; Chia-Lin Lee, National Taiwan University
LANGUAGE: Lexicon

C58 - ERP evidence of lexical-semantic processing in preschool children with language delays
Yaqiong Xiao, Shenzhen Institute of Neuroscience, Yaqiong Xiao, Shenzhen Institute of Neuroscience; Aiwen Yi, Foshan Fosun Chancheng Hospital Lu Song, Shenzhen Institute of Neuroscience; Peng Wang
LANGUAGE: Lexicon

C59 - Investigating the dynamic influences of bilingual language regulation and physiological regulation on domain-general cognitive control
Nathaniel Braswell, Claremont McKenna College, Megan Zirnstein, Pomona College
LANGUAGE: Other

C60 - Asymmetric late discriminative negativities reveal multiple levels of specification in speech sound representations
Zhanao Fu, University of Toronto, Philip Monahan, University of Toronto, University of Toronto Scarborough
LANGUAGE: Other

C61 - Investigating the role of compositionality in an artificial language: An event-related potential study
Tania Delgado, University of California, San Diego, Seana Coulson, University of California, San Diego
LANGUAGE: Other

C62 - The Influence of Parafoveal Words on Foveal Word Processing in Deaf Readers
Brennan Terhune-Cotter, San Diego State University, Katherine Midgley, San Diego State University; Phillip Holcomb, San Diego State University Karen Emmorey, San Diego State University
LANGUAGE: Other

C63 - The neural basis of naturalistic expository reading in bilinguals: evidence from inter-subject synchronization pattern
Chanyuan Gu, The Hong Kong Polytechnic University, Ping Li, The Hong Kong Polytechnic University
LANGUAGE: Other

C64 - Neural systems for phonology contribute to the act of writing
Mio Yokoi, National rehabilitation center for persons with disabilities, Kouji Takano, National rehabilitation center for persons with disabilities; Tomoki Uno, National rehabilitation center for persons with disabilities Kimihiro Nakamura, National rehabilitation center for persons with disabilities
LANGUAGE: Other

C65 - Expecting the unexpected: A reanalysis of a multi-laboratory study with an investigation of prior word surprisal
Sophie Jano, University of South Australia, Zachariah Cross, University of South Australia; Alex Chatburn, University of South Australia Matthias Schlesewsky, University of South Australia; Ina Bornkessel-Schlesewsky, University of South Australia
LANGUAGE: Other

C66 - Tracking the time-course of cross-dialect comprehension with ERPs: Comparing Southern and Mainstream US-accented speech perception
Holly Zaharchuk, The Pennsylvania State University, Abby Walker, Virginia Polytechnic Institute and State University; Janet Van Hell, The Pennsylvania State University
LANGUAGE: Other

C67 - Deafness and ASL Fluency Each Differentially Impact Biological Motion Perception

Carly Leannah, Gallaudet University, Lorna Quandt, Gallaudet University; Melody Schwenk, Gallaudet University Athena Willis, Gallaudet University
LANGUAGE: Other

C68 - The transmodal distributed language network includes an inferior temporal region that shows selectivity for visual word-forms
Joseph Salvo, Northwestern University, Maya Lakshman, Northwestern University; Ania M. Holubecki, Northwestern University Zeynep Saygin, Ohio State University; Rodrigo M. Braga, Northwestern University
LANGUAGE: Other

C69 - A feasibility study: application of brain-computer interface in augmentative and alternative communication for non-speaking individuals with neurodevelopmental disabilities
Maryam Mahmoudi, University of Minnesota,
LANGUAGE: Other

C71 - A real-time neurobiological model of discourse comprehension: a fused fMRI/EEG study
Min Kyung Hong, Vanderbilt University, Katherine Aboud, Vanderbilt University
LANGUAGE: Other

C72 - Decoding knowledge of newly-learned language from neural representations of semantic meaning
Megan Hillis, Dartmouth College, Brianna Aubrey, Dartmouth College; Yeongji Lee, Dartmouth College Julien Blanchet, Dartmouth College; Qijia Shao, Columbia University; Xia Zhou, Columbia University; Devin Balkcom, Dartmouth College; David Kraemer, Dartmouth College
LANGUAGE: Other

C73 - Representations from deep language models capture neural patterns in naturalistic reading of scientific texts: cognitive plausibility and neural relevance
Shaoyun Yu, The Hong Kong Polytechnic University, Chanyuan Gu, The Hong Kong Polytechnic University; Kexin Huang, The Hong Kong Polytechnic University Ping Li, The Hong Kong Polytechnic University
LANGUAGE: Other

C74 - Contributions of boundary representations in the hippocampus and visual scene network to individual differences in episodic memory organization
Yu Jin Rah, Seoul National University, Jung Han Shin, Korea Advanced Institute of Science and Technology; Sang Ah Lee, Seoul National University
LONG-TERM MEMORY: Episodic

C75 - Repetition effects on eye-tracking, vividness ratings, and brain activity during future simulation
Roni Setton, Harvard University, Jordana Wynn, University of Victoria; Daniel L. Schacter, Harvard University
LONG-TERM MEMORY: Episodic

C76 - Investigation of the neural effects of memory training to reduce false memories in older adults
Jordan Chamberlain, The Pennsylvania State University, Indira Turney, Columbia University; Jonathan Hakun, The Pennsylvania State University Ashley Steinkrauss, The Pennsylvania State University; Lesley Ross, Clemson University; Brenda Kirchhoff, Saint Louis University; Nancy Dennis, The Pennsylvania State University
LONG-TERM MEMORY: Episodic

C77 - Using dense-sampling to reveal distributed representations of familiarity and decisional processes in recognition memory
Tyler Santander, University of California, Santa Barbara, Evan Layher, University of California, Santa Barbara; Michael Miller, University of California, Santa Barbara
LONG-TERM MEMORY: Episodic

C78 - Investigating episodic memory as a multi-dimensional cognitive process
Soroush Mirjalili, The University of Texas at Austin, Audrey Duarte, The University of Texas at Austin
LONG-TERM MEMORY: Episodic

C79 - Successful generalization of conceptual knowledge after training to remember specific events
Troy Houser, University of Oregon, Dagmar Zeithamova, University of Oregon
LONG-TERM MEMORY: Episodic

C80 - No enhancement of episodic memory from visual statistical learning detected when using a forced-choice recognition test
Evan Grandoit, Northwestern University, Paul Reber, Northwestern University
LONG-TERM MEMORY: Episodic

C81 - Hippocampal connectivity with regions involved in processing internal and external information during event perception.
Karen Sasmita, Cornell University, Khena M. Swallow, Cornell University
LONG-TERM MEMORY: Episodic

C82 - The contextualization of recent and remote autobiographical memories
Nelly Matorina, University of Toronto, Yi Lin Wang, University of Toronto; Javid Guliyev, University of Toronto Morgan Barense, University of Toronto, Rotman Research Institute
LONG-TERM MEMORY: Episodic

C83 - Evidence accumulation by single units in the human Medial Temporal Lobe during memory-based decisions.
Mar Yebra, Cedars-Sinai Medical Center, Andrea G.P. Schjetan, Krembil Research Institute, Toronto Western Hospital; Araceli R. Cardenas, Krembil Research Institute, Toronto Western Hospital Lakshmi N. Govindarajan, Carney Institute of Brain Science, Brown University; Clayton Mosher, Department of Neurosurgery, Cedars-Sinai Medical Center; Yousef Salimpour, The Johns Hopkins Hospital, Department of Neurology; Taufik A. Valiante, Krembil Research Institute, Toronto Western Hospital; Suneil Kalia, Krembil Research Institute, Toronto Western Hospit; William Anderson, The Johns Hopkins Hospital, Department of Neurology; Adam Mamelak, Cedars-Sinai Medical Center; Ueli Rutishauser, Cedars-Sinai Medical Center
LONG-TERM MEMORY: Episodic

C84 - Lateral Parietal and Temporal Lobe Contributions to Associative Memory: Strategic, Not Representational
Daniel Levy, Reichman University, Shir Ben-Zvi Feldman, Tel Aviv University; Nachum Soroker, Loewenstein Rehabilitation Hospital
LONG-TERM MEMORY: Episodic

C85 - Effects of handedness on episodic memory: Evidence from a non-verbal task
Jana Reifegerste, Georgetown University, Karim Johari, Louisiana State University; Michael Ullman, Georgetown University
LONG-TERM MEMORY: Episodic

C86 - Characterizing the relationship between intrusive memory reactivation and memory generalization using a laboratory-based model of rumination.
Isabel Leiva, Temple University, Chelsea Helion, Temple University; Vishnu Murty, Temple University
LONG-TERM MEMORY: Episodic

C87 - Individual differences in the effect of lapses of attention on subsequent spatial context memory
Gabriela VŽlez Largo, McGill University, Abdelhalim Elshiekh, McGill University; Sricharana Rajagopal, Douglas Mental Health University Institute Toscane Hamaïde, McGill University; Stamatoula Pasvanis, Douglas Mental Health University Institute; M. Natasha Rajah, McGill University, Douglas Mental Health University Institut
LONG-TERM MEMORY: Episodic

C88 - Towards a Multiple-Systems Account of Race-Related Biases in Recognition Memory
Christopher Iyer, Stanford University, Tyler Bonnen, Stanford University; Anthony Wagner, Stanford University
LONG-TERM MEMORY: Episodic

C89 - CROSS REGIONAL MECHANISMS OF AUTOBIOGRAPHICAL MEMORY IN THE HUMAN BRAIN
James Stieger, Stanford University, Josef Parvizi, Stanford University
LONG-TERM MEMORY: Episodic

C90 - Similarity and Dissimilarity Encoding in Memory Specificity in Young and Older Adults
Jessie Chien, University of Southern California, Teal Eich, University of Southern California
LONG-TERM MEMORY: Episodic

C91 - Perceived Plausibility Modulates Hippocampal Activity in Episodic Counterfactual Thinking
Karen Miceli, Duke University, Karen Miceli, Duke University; Ricardo Morales Torres, Duke University Ari Khoudary, University of California Irvine; Natasha Parikh, University of North Carolina at Chapel Hill; Felipe De Brigard, Duke University
LONG-TERM MEMORY: Episodic

C92 - Lingering novelty signal facilitates the formation of enduring episodic memory
Jia-Hou Poh, Duke University, R.Alison Adcock, Duke University
LONG-TERM MEMORY: Episodic

C93 - Hippocampal and cortical activity mechanisms of episodic memory
Victoria Schelkun, Columbia University, David Clewett, University of California Los Angeles; Lila Davachi, Columbia University
LONG-TERM MEMORY: Episodic

C94 - Perirhinal cortex automatically tracks multiple types of familiarity regardless of task-relevance
Haopei Yang, Western University, Ken McRae, Western University; Stefan Kohler, Western University
LONG-TERM MEMORY: Other

C95 - Theta and alpha oscillations in the hippocampus and medial parietal cortex support the formation of location-based representations
Akul Satish, University of York, Vanessa Keller, University of York; Sumaiyah Raza, University of Cambridge Shona Fitzpatrick, University of York; Aidan Horner, University of York
LONG-TERM MEMORY: Other

C96 - Spinal cord injury-activated C/EBP?-AEP axis mediates cognitive impairment through APP C586/Tau N368 fragments spreadin
Ran Zhu, Tongji University, Zhourui Wu, Tongji University; Liming Cheng, Tongji University
LONG-TERM MEMORY: Other

C97 - Human Models of Craving: Instrumental Behavior and Self Reports of Craving
Nicholas Ruiz, Temple University, Devlin Eckardt, Temple University; Lisa Briand, Temple University Mathieu Wimmer, Temple University; Vishnu Murty, Temple University
LONG-TERM MEMORY: Other

C98 - Detecting Neural Signals Related to Memory Consolidation in Humans during Sleep
Ashwin Harimohan, Western University, Laura Batterink, Western University
LONG-TERM MEMORY: Other

C99 - Weakening Memories with Conjoint Memory Reactivation and Sleep Disruption
Erika Yamazaki, Northwestern University, Nathan Whitmore, Massachussetts Institute of Technology; Ken Paller, Northwestern University
LONG-TERM MEMORY: Other

C100 - Does the hippocampus contribute to statistical learning through pattern separation? An fMRI study of representational similarity
Pin-Wei Chen, National Central University, Erik C. H. Chang, National Central University; Denise H. Wu, National Central University
LONG-TERM MEMORY: Other

C101 - Group-Level Template Labels Obscure Individual Text-Selective Response in Left Ventral Temporal Cortex
Jamie Mitchell, Stanford University, Jamie Mitchell, Stanford University; Alex White, Barnard College Maya Yablonski, Stanford University; Kenny Tang, Vanderbilt University; Jason Yeatman, Stanford University. METHODS: Neuroimaging

C102 - Reactivating mindfulness during REM sleep to influence dream content
Norah Wolk, Northwestern University, Daniel Morris, Northwestern University; Yasmeen Nahas, Northwestern University Ken A. Paller, Northwestern University; Remington Mallett, Northwestern University
THINKING: Other

C103 - Automatic sleep staging for nap studies
Abigail Roman, Northwestern University, Remington Mallett, Northwestern University. THINKING: Other

C104 - How dynamic is the stream of consciousness? Thoughts move less freely under cognitive control
Yasmeen Nahas, Northwestern University, Remington Mallett, Northwestern University; Kalina Christoff, University of British Columbia Ken Paller, Northwestern University; Caitlin Mills, University of Minnesota. THINKING: Other

C105 - Experience sampling during fMRI reveals distinct dynamics in the stream of thought
Sneha Sheth, University of British Columbia, Lawrence Ward, University of British Columbia; Matthew Dixon, Stanford University Rebecca Todd, University of British Columbia; Evan Thompson, University of British Columbia; Kalina Christoff, University of British Columbia. THINKING: Other

C106 - Neurocognitive Correlates of Action-Control in Children with Attention-Deficit/Hyperactivity Disorder
Joman Y Natsheh, Children's Specialized Hospital, Ekaterina Dobryakova, Kessler Foundation; Michael Dacanay, Kessler Foundation John DeLuca, Kessler Foundation
EXECUTIVE PROCESSES: Goal maintenance & switching

Poster Session D

Monday, March 27, 8:00 am - 10:00 am, Pacific Concourse

D1 - Neural and Environmental Correlates of Empathetic Behaviors in Adolescence
Calli Smith, Boston Children's Hospital, Catherine Stamoulis, Harvard Medical School/Boston Children's Hospital
EMOTION & SOCIAL: Development & aging

D2 - Differential Functional Connectivity Between Autism Spectrum Disorder and Typical Development over Each Year of the Adolescent Period
Ashley Wade, National Taiwan University, Joshua Ooh Son Goh, National Taiwan University; Susan Shur-Fen Gau, National Taiwan University Yi-Ling Chien, National Taiwan University
EMOTION & SOCIAL: Development & aging

D3 - Habitual emotion regulation contributes to emotional episodic encoding particularly with increasing age
Masoud Seraji, University of Texas at Austin, Taylor James, Emory University; Audrey Duarte, University of Texas at Austin
EMOTION & SOCIAL: Development & aging

D4 - Age-Specific Effects of Music Encoding on Reward and Memory Systems in Healthy and Cognitively Impaired Aging
Nicholas Kathios, Northeastern University, Laurel Gabard-Durnam, Northeastern University; Psyche Loui, Northeastern University
EMOTION & SOCIAL: Development & aging

D5 - Altered brain activity of salience network in adolescence during facial emotion processing
Jiwon Chun, The Catholic University of Korea, Jihye Choi, The Catholic University of Korea; Arom Pyeon, The Catholic University of Korea Min Kyung Hu, The Catholic University of Korea; Hyun Cho, The Catholic University of Korea; In Young Choi, The Catholic University of Korea; Jung-Seok Choi, Samsung Medical Center; Kook-Jin Ahn, The Catholic University of Korea; Jong-Ho Nam, The Catholic University of Korea; Dai-Jin Kim, The Catholic University of Korea
EMOTION & SOCIAL: Development & aging

D6 - Can you HAND-le these emotions? An investigation on hemispheric dominance with exposure to visual stimuli.
Keirsten Howard, Belmont University, Prathyusha Gowri Srinivasan, Belmont University; Youstina Tadros, Belmont University Hannah Potts, Belmont University; Carole Scherling, Belmont University
EMOTION & SOCIAL: Emotion-cognition interactions

D7 - Different Lifetime Periods of Stress Uniquely Predict Brain Function During Working Memory and Episodic Retrieval Tasks
Ian McDonough, The University of Alabama, Hillary Erwin, The University of Alabama; Hannah Apostolou, The University of Alabama Alissa McIntyre, The University of Alabama; Martha Crowther, The University of Alabama; Rebecca Allen, The University of Alabama
EMOTION & SOCIAL: Emotion-cognition interactions

D8 - The Effect of Acute Stress on Cognition in Parkinson's Disease Patients and Older Adults [IN PROGRESS]
Lyla Hawari, McGill University, Mario Bogdanov, McGill University; Lara Ekin Telli, McGill University Nasri Balit, McGill University; Madeleine Sharp, McGill University
EMOTION & SOCIAL: Emotion-cognition interactions

D9 - Contrasting mindfulness state induction effects on cognitive control and emotion regulation
Marne White, Washington University in St. Louis, Deanna Wu, Washington University in St. Louis; Samuel Wang, Washington University in St. Louis Jeremy Jacobson, Washington University in St. Louis; Natee Viravan, Mahidol University; Yanli Lin, Washington University in St. Louis; Todd Braver, Washington University in St. Louis
EMOTION & SOCIAL: Emotion-cognition interactions

D10 - Differences in conversation behaviour relate to the resting state functional connectivity of Left-IFG
Dhaval Bhatt, Dartmouth College, Jeremy Huckins, Dartmouth College; Andrew Campbell, Dartmouth College Meghan Meyer, Columbia University
EMOTION & SOCIAL: Emotion-cognition interactions

D11 - Inter-subject variability in post-encoding default network connectivity explains affects of social memories
Siddhant Iyer, Dartmouth College, Eleanor Collier, UC Riverside; Meghan Meyer, Dartmouth/Columbia
EMOTION & SOCIAL: Emotion-cognition interactions

D12 - Decoded reinstatement of latent associative structure is associated with neural generalization of learned threat
Samuel Cooper, University of Texas at Austin, Augustin Hennings, Princeton University; Sophia Bibb, University of Texas at Austin Joseph Dunsmoor, University of Texas at Austin
EMOTION & SOCIAL: Emotion-cognition interactions

D13 - Learning to motivate: Whole-brain engagement during real-time fMRI neurofeedback of the ventral tegmental area
Rachael Wright, Duke University, Shabnam Hakimi, Duke University; Laura Yost, Duke University Jeff MacInnes, Duke University; Kathryn Dickerson, Duke University; Kevin LaBar, Duke University; R. Alison Adcock, Duke University
EMOTION & SOCIAL: Emotion-cognition interactions

D14 - Time and emotion modulate the intrinsic functional organization of lateral prefrontal cortex
Jingyi Wang, University of California, Santa Barbara, Regina Lapate, University of California, Santa Barbara
EMOTION & SOCIAL: Emotion-cognition interactions

D15 - The persistence of affect and temporal memory across event boundaries
Mengsi Li, UCSB, Brooke Schwartzman, UCSB; Julia Pratt, UCSB Regina Lapate, UCSB
EMOTION & SOCIAL: Emotion-cognition interactions

D16 - Identification of emotional responses towards threat and different stereotypes using fMRI data and an MVPA approach
Gloria Mendoza Franco, Aalto University, Matthias Aulbach, Paris London UniversitŠt Salzburg; Ville J. Harjunen, University of Helsinki Inga Jasinskaja, University of Helsinki; Anna Peltola, Aalto University; J. Niklas Ravaja, University of Helsinki; Matilde Tassinari, University of Helsinki; Saana Vainio, Aalto University; Iiro P. JŠŠskelŠinen, Aalto University
EMOTION & SOCIAL: Emotional responding

D17 - PLEASURABLE MUSIC MODULATES μ-OPIOID SYSTEM ACIVITY IN THE BRAIN
Vesa Putkinen, Turku PET Centre, University of Turku, Lauri Nummenmaa, Turku PET Centre, University of Turku
EMOTION & SOCIAL: Emotional responding

D18 - Functional and cytoarchitectonic mapping of subparts in human insula that are active during experimental tasks and involved in electrically elicited anxiety and pain
Anna Duong, Brown University, Aaron Kucyi, Drexel University; Julian Quabs, University of Dusseldorf Zoe Lusk, Stanford University; Josef Parvizi, Stanford
EMOTION & SOCIAL: Emotional responding

D19 - Sensorimotor simulation via mu rhythm suppression is associated with greater empathic accuracy
Shir Genzer, The Hebrew University of Jerusalem, Desmond Ong, University of Texas at Austin; Jamil Zaki, Stanford University Anat Perry, the Hebrew University of Jerusalem
EMOTION & SOCIAL: Other

D20 - State anxiety dampens the relationship of surprise with hedonic utility and curiosity
Xinxu Shen, Temple University, Vishnu Murty, Temple University; David Smith, Temple University
EMOTION & SOCIAL: Other

D21 - Association of Depressive/anxiety Symptoms and Increase of Rapid-eye-movement Sleep in the Evening Chronotype
Toru Ishii, Stanford University, Makoto Kawai, Stanford University; Isabelle Cotto, Stanford University Ruth O'hara, Stanford University
EMOTION & SOCIAL: Other

D22 - Exploring EEG-based resting-state and task-related neural predictors of team performance
Imogen Weigall, University of South Australia, Zachariah Cross, University of South Australia; Matthias Schlesewsky, University of South Australia Ina Bornkessel-Schlesewsky, University of South Australia; Ruchi Sinha, University of South Australia
EMOTION & SOCIAL: Other

D23 - Self-focused by default: Spontaneous medial prefrontal cortex and DMN core subsystem activity during rest predicts the desire to think about the self
Danika Geisler, Dartmouth, Meghan Meyer, Columbia
EMOTION & SOCIAL: Other

D24 - The Impact of Self-Relevance on Neural Signals Reflecting Attention, Perception and Reward Learning
Mathew Rocha Hammerstrom, University of Victoria, Olave Krigolson, University of Victoria
EMOTION & SOCIAL: Self perception

D25 - Dynamic upregulation of the default mode network via transcranial alternating current stimulation.
Joshua Brown, Florida State University, Kevin Clancy, Florida State University; Wen Li, Florida State University
EMOTION & SOCIAL: Self perception

D26 - Is there a 'bilingualism effect' on neural indices of cognitive control
Nancy Rodas De Leon, University of California, Merced, Elif Isbell, University of California, Merced.
EXECUTIVE PROCESSES: Development &aging

D27 - Unpredictable cuing in working memory updating training changes connectivity of default mode and cognitive networks: ViCTOR trial in healthy aging
Glenn Sherard, The University of Texas at Dallas, Glenn Sherard, The University of Texas at Dallas; Paulina Skolasinska, The University of Texas at Dallas Evan Smith, The University of Texas at Dallas; Shuo Qin, The University of Texas at Dallas; Chandramallika Basak, The University of Texas at Dallas
EXECUTIVE PROCESSES: Development &aging

D28 - Different Strategic Neural Correlates Representing Distances Implicates Age-related Distortions in Spatial Navigation
Po-Kai Wang, National Taiwan University, Yi-Hsiu Lee, National Taiwan University; Jing-Yu Chuang, National Taiwan University Ting-Syuen Wang, National Taiwan University; Cody Li-Sheng Wang, National Taiwan University; Wen-Chieh Chao, National Taiwan University; Chih-Yi Chen, National Taiwan University; Yu-Shiang Su, National Taiwan University; Joshua Oon Soo Goh, National Taiwan University
EXECUTIVE PROCESSES: Development &aging

D29 - Aging yields improvements as well as declines across attention and executive functions
João Veríssimo, University of Lisbon, Paul Verhaeghen, Georgia Institute of Technology; Noreen Goldman, Princeton University Maxine Weinstein, Georgetown University; Michael Ullman, Georgetown University
EXECUTIVE PROCESSES: Development &aging

D30 - Age-Related Differences in Electrophysiological Dynamics on a Flanker and Semantic Retrieval Task
Zachary Gemelli, Rhode Island Hospital, Elena Festa, Brown University; William Heindel, Brown University Spencer Price, Brown University; Laura Korthauer, Rhode Island Hospital/Warren Alpert Medical School Brown Uni
EXECUTIVE PROCESSES: Development &aging

D31 - Practice-induced Changes in Frontoparietal Activation and Representations During Task Switching in Children
Sina Schwarze, Max Planck Institute for Human Development, Neda Khosravani, Max Planck Institute for Human Development; Silvia Bunge, University of California at Berkeley Yana Fandakova, University of Trier
EXECUTIVE PROCESSES: Development &aging

D32 - Kindergartner?s executive function abilities are associated with their neural representations of symbolic magnitude
Andrew Lynn, Vanderbilt University, Laura Barquero, Vanderbilt University; Gavin Price, University of Exeter Laurie Cutting, Vanderbilt University. EXECUTIVE PROCESSES: Development &aging

D33 - Creating mindful enhancements: The role of mindfulness meditation in improving cognitive control to reduce smartphone related distractions for divergent creative thinkers.
Joshua Upshaw, University of Arkansas, Darya Zabelina, University of Arkansas
EXECUTIVE PROCESSES: Goal maintenance & switching

D34 - Investigating the control organization of the lateral prefrontal cortex by timescale and focus
McKinney Pitts, Florida State University, Derek Nee, Florida State University
EXECUTIVE PROCESSES: Goal maintenance & switching

D35 - Differential Associations of Executive Control Performance and Network Connectivity between Monolingual and Bilingual Older Adults with Late Life Depression
Michelle Kassel, University of California, San Francisco/San Francisco VAMC, Philip Insel, University of California, San Francisco; Derek Satre, University of California, San Francisco / Kaiser Permanente J. Craig Nelson, University of California, San Francisco; Duygu Tosun, University of California, San Francisco; R. Scott Mackin, University of California, San Francisco/San Francisco VAMC
EXECUTIVE PROCESSES: Goal maintenance & switching

D36 – WITHDRAWN

D37 - Examining effects of cTBS to the prefrontal cortex on cognitive control using fMRI
Alexandria Meyer, Florida State University, Derek E. Nee, Florida State University
EXECUTIVE PROCESSES: Goal maintenance & switching

D38 - EEG decoding of task rules and conflict history effects in the Stroop task
Michael Freund, Washington University in St. Louis, Todd Braver, Washington University in St. Louis
EXECUTIVE PROCESSES: Goal maintenance & switching

D39 - Rhythmic oscillations between task sets delineate stable versus flexible cognitive control
Thomas Biba, University of Toronto, Keisuke Fukuda, University of Toronto; Bjorn Herrmann, Rotman Research Institute Taufik Valiante, Krembil Research Institute; Katherine Duncan, University of Toronto
EXECUTIVE PROCESSES: Goal maintenance & switching

D40 - Control mechanisms informed by neural representation of task rules
Davide Gheza, Washington University in St Louis, Wouter Kool, Washington University in St Louis
EXECUTIVE PROCESSES: Goal maintenance & switching

D41 - Cerebral Blood Flow Changes Associated with Music Listening and Aerobic Exercise: Independent Effects in Post-intervention Executive Function Benefits (In Progress)
Azar Ayaz, The University of Western Ontario, Lian Buwadi, The University of Western Ontario; Gianna Jeyarajan, The University of Western Ontario Alma Rahimi, The University of Western Ontario; Matthew Heath, The University of Western Ontario
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D42 - A novel methodology for capturing the manual and neural dynamics of cognitive control
Samara Morrison, University of Auckland, Christopher Erb, University of Auckland; Katie Smith, University of Auckland Paul Corballis, University of Auckland
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D43 - Neural Changes Underlying Inhibitory Control in Older Adults with Age-Related Hearing Loss
Shraddha Shende, Illinois State University, Raksha Mudar, University of Illinois
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D44 - Flexible and Reliable Strategies for Cognitive Control
William Alexander, Florida Atlantic University,
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D45 - The Ultimate Test for a Bilingual Advantage in Executive Functioning, Self-Control, or Attention Control
Kenneth Paap, San Francisco State University, Regina Anders-Jefferson, San Francisco State University; Nithya Balakrishnan, San Francisco State University Cassandra Geraty, San Francisco State University; Rin Iosilevsky, San Francisco State University; John Majoubi, San Francisco State University; Mauricio Molina, San Francisco State University; Cassia Reeddig, San Francisco State University; Kathleen Rivera-Franco, San Francisco State University
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D46 - Comparing the electrophysiological dynamics of inhibitory control between action-stopping and -changing in humans
Mario Hervault, University of Iowa, Jan Wessel, University of Iowa
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D47 - Characterizing cognitive control networks using a precision neuroscience approach
Patrick Bissett, Stanford University, Sunjae Shim, Stanford University; Jaime Ali Rios, Stanford University Henry Jones, University of Chicago; McKenzie Hagen, University of Washington; Jeanette Mumford, Stanford University; James Shine, University of Sydney; Russell Poldrack, Stanford University
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D48 - The Habituation of Higher-Order Conscious Processes: Evidence from Mental Arithmetic
Tala Elsabbagh, San Francisco State University, Latoya Wright-Wilson, San Francisco State University; Sarah Brauer, San Francisco State University Ezequiel Morsella, San Francisco State University
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D49 - Surprise-induced inhibition of active task set representations
Benjamin Rangel, University of Iowa, Jan Wessel, University of Iowa
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D50 - A computational model of adaptive control over cognitive stability and flexibility
Raphael Geddert, Duke University, John Pearson, Duke University; Tobias Egner, Duke University
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D51 - Commonalities and differences between error- and surprise processing revealed by post-trial behavioral slowing and EEG decoding analysis
Yoojeong Choo, University of Iowa, Alec Mather, Sony; Jan Wessel, University of Iowa
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D52 - Inhibitory Control of Hippocampal Activity by the Prefrontal Cortex Achieved by Medial Septal Pacemaker Suppression
MaitŽ Crespo García, University of Cambridge, Dace Ap?valka, University of Cambridge; Xu Lei, Southwest University, China Michael Anderson, University of Cambridge
EXECUTIVE PROCESSES: Monitoring & inhibitory control

D53 - Investigating External Sensory Noise Effects on Cognition
Sage Sherman, University of Colorado Boulder, Maya Greenstein, University of Colorado Boulder; Mathias Basner, Perelman School of Medicine at University of Pennsylvania Torin Clark, University of Colorado Boulder; Allison Anderson, University of Colorado Boulder
EXECUTIVE PROCESSES: Other

D54 - Uncovering the structure of sequential control through data-driven ontology discovery
Jaime Ali Rios, Stanford University, Patrick Bissett, Stanford University; Russell Poldrack, Stanford University
EXECUTIVE PROCESSES: Other

D55 - Impact of Ovarian Hormone Suppression on Cognitive Function and Brain Structure
Elle Murata, University of California, Santa Barbara, Hannah Grotzinger, University of California, Santa Barbara; Gabriella Natividad, University of California, San Diego Andrea Gabay, University of California, San Diego; Morgan Fitzgerald, University of California, San Diego; Averi Giudicessi, Boston University; Sanjay Agarwal, University of California, San Diego; Matthew S. Panizzon, University of California, San Diego; Emily G. Jacobs, University of California, Santa Barbara
EXECUTIVE PROCESSES: Other

D56 - COVID-19 and its negative, potentially long-term impact on executive function (task-switching, inhibitory control, attention), mood, and anxiety
Olivia Keaton, Univ of South Carolina Aiken, Alexandra Roach, University of South Carolina Aiken
EXECUTIVE PROCESSES: Other

D57 - Domain-specific relationships between cognitive deficits and post-concussion symptoms following mild Traumatic Brain Injury
Hope Nyarady, University at Buffalo, David Shucard, University at Buffalo; Praveen Arany, University at Buffalo Thomas Mang, University at Buffalo; Janet Shucard, University at Buffalo; Thomas Covey, University at Buffalo
EXECUTIVE PROCESSES: Other

D58 - Source Estimation of the Reward Positivity and Related Resting State Network Activity in Major Depressive Disorder
Christopher Pirrung, University of New Mexico, Garima Singh, University of New Mexico; Jeremy Hogeveen, University of New Mexico Davin Quinn, University of New Mexico; James Cavanagh, University of New Mexico
EXECUTIVE PROCESSES: Other

D59 - Neuromodulation of aggressiveness: a tDCS experiment
Chiara Gramegna, University of Milano-Bicocca, Massimo Clerici, University of Milano-Bicocca; Nadia Bolognini, University of Milano-Bicocca
EXECUTIVE PROCESSES: Other

D60 - Using Precision Neuroimaging to Explore the Neural Organization of Cognitive Control
Katherine Michon, University of Michigan, Shijie Qu, University of Michigan; Violet Zhou, University of Michigan Jahla Osborne, University of Michigan; Thad Polk, University of Michigan
EXECUTIVE PROCESSES: Other

D61 - Effects of dopaminergic receptor stimulation upon processing of contextual information and the renewal effect
Alina Sophie Nostadt, Ruhr-University Bochum / University Hospital Bergmannsheil, Michael Nitsche, Leibniz Research Centre for Working Environment and Human Fa; Martin Tegenthoff, Ruhr-University Bochum / University Hospital Bergmannsheil Silke Lissek, Ruhr-University Bochum / University Hospital Bergmannsheil
EXECUTIVE PROCESSES: Other

D62 - Delta-band oscillations in the frontoparietal network support cognitive control for abstract rules
Mattia Federico Pagnotta, University of California, Berkeley, Justin Riddle, University of North Carolina at Chapel Hill; Mark D'Esposito, University of California, Berkeley
EXECUTIVE PROCESSES: Other

D63 - Changes in cognitive-behavioral outcomes after real-time fMRI VTA neurofeedback training in individuals with ADHD
Laura Yost, Duke University, Laura Yost, Duke University; JiaHou Poh, Duke University Rachael N. Wright, Duke University; Shabnam Hakimi, Duke University; Ben Muzekari, Duke University; Kelly Eom, Duke University; John Thorp, Duke University; Jeff J. MacInnes, Duke University; Kathryn E. Dickerson, Duke University; R. Alison Adcock, Duke University
EXECUTIVE PROCESSES: Other

D64 - Verbal fluency performance is associated with cognitive reserve in preclinical Alzheimer?s disease
Eun Hyun Seo, Chosun University, Hyung-Jun Yoon, Chosun University; Kun Ho Lee, Chosun University
EXECUTIVE PROCESSES: Other

D65 - Psychophysiological determinants of vigilance in basically awake people
Stefan Arnau, IfADo, Daniel Schneider, IFADO; Stefan Arnau, IfADo Stephan Getzmann, IfADo
EXECUTIVE PROCESSES: Other

D66 - High-resolution 7T functional MRI reveals that the distributed cortical network involved in social cognition includes regions in the amygdala and entorhinal cortex
Donnisa Edmonds, Northwestern University, Joey Salvo, Northwestern University; Qiaohan Yang, Northwestern University Maya Lakshman, Northwestern University; Christina Zelano, Northwestern University; Kendrick Kay, University of Minnesota; Rodrigo Braga, Northwestern University
EXECUTIVE PROCESSES: Other

D67 - Diminishing Creative Returns: Predicting Optimal Creative Performance via Individual Differences in Executive Functioning
Kent Hubert, University of Arkansas, Darya Zabelina, University of Arkansas
EXECUTIVE PROCESSES: Other

D68 - White Matter Tract Integrity and Academic Achievement in Childhood
Emily M. Harriott, Vanderbilt University, Tin Q. Nguyen, Vanderbilt University; Bennett A. Landman, Vanderbilt University Laura A. Barquero, Vanderbilt University; Laurie E. Cutting, Vanderbilt University
EXECUTIVE PROCESSES: Other

D69 - The neural architecture of generative compositionality: how do we infer the meaning of 'un-reject-able-ish'
Xiaochen Zheng, Donders Institute for Brain, Cognition and Behaviour, Mona Garvert, Max-Planck-Institute for Human Cognitive and Brain Sciences; Hanneke den Ouden, Donders Institute for Brain, Cognition and Behaviour Roshan Cools, Radboud University Medical Center
EXECUTIVE PROCESSES: Other

D71 - Differential Theta Brain Activities Depending on the Memory Strategies in Visual Working Memory
Hayate Oonishi, Hokkaido University, Koichi Yokosawa, Hokkaido University
EXECUTIVE PROCESSES: Working memory

D72 - Prestimulus EEG microstate and its sources reveal an aberrant default mode network in subjects with addictive disorders.
Simran Kaur, All India Institute of Medical Sciences, New Delhi, Chaithanya Leon, All India Institute of Medical Sciences, New Delhi; Shaon Dastidar, All India Institute of Medical Sciences, New Delhi YatanPalSingh Balhara, All India Institute of Medical Sciences, New Delhi; Ratna Sharma, All India Institute of Medical Sciences, New Delhi; Prashant Tayade, All India Institute of Medical Sciences, New Delhi; Suriya Muthukrishnan, All India Institute of Medical Sciences, New Delhi
EXECUTIVE PROCESSES: Working memory

D73 - Dynamic perturbation manipulates ordinal performance in human sequence working memory
Yangzi Chen, Peking University, Jiaqi Li, Peking University; Huan Luo, Peking University
EXECUTIVE PROCESSES: Working memory

D74 - Mapping the Relationship between Cognitive Load and Performance in Multitasking Environments Using Mobile Functional Near-Infrared Spectroscopy (fNIRS)
Katherine Boere, The University of Victoria, Olav Krigolson, The University of Victoria; Francesca Anderson, The University of Victoria
EXECUTIVE PROCESSES: Working memory

D75 - Dissociable Frontal Midline and Posterior Signatures of Mismatch Detection in Working Memory
Josset Yarbrough, Northwestern University, Lingxiao Shi, Northwestern University; Kaustav Chattopadhyay, University of California, Berkeley Vasanth Kommu, University of California, Berkeley; Robert Knight, University of California, Berkeley; Elizabeth Johnson, Northwestern University
EXECUTIVE PROCESSES: Working memory

D76 - Frontal-posterior theta-alpha oscillations underlie cognitive control in working memory
Lingxiao Shi, Northwestern University, Kaustav Chattopadhyay, University of California, Berkeley; Vasanth Kommu, University of California, Berkeley Robert Knight, University of California, Berkeley; Elizabeth Johnson, Northwestern University
EXECUTIVE PROCESSES: Working memory

D77 - How do EEG signatures of working memory capacity depend on memory content?
Bo-Cheng Kuo, National Taiwan University, Fang-Wen Chen, National Taiwan University; Freek van Ede, Vrije Universiteit Amsterdam
EXECUTIVE PROCESSES: Working memory

D78 - Predictive coding in working memory: EEG evidence for prospective motor codes under task uncertainty
Daniel Schneider, IfADo, Marlene Rššner, IfADo; Melinda Sabo, IfADo Laura Klatt, IfADo; Edmund Wascher, IfADo
EXECUTIVE PROCESSES: Working memory

D79 - The impact of aging on the neural oscillatory dynamics serving working memory processing
Seth Springer, University of Nebraska Medical Center, Christine Embury, Boys Town National Research Hospital; Hannah Okelberry, Boys Town National Research Hospital Hallie Johnson, Boys Town National Research Hospital; Madelyn Willet, Boys Town National Research Hospital; Tony Wilson, Boys Town National Research Hospital
EXECUTIVE PROCESSES: Working memory

D80 - Investigating Effects of Auditory Salience on TMS-EEG Artifact and Local Cortical Excitability
Manjima Sarkar, Stanford University, Jessica Ross, Stanford University; Christopher Cline, Stanford University Corey Keller, Stanford University
METHODS: Electrophysiology

D81 - An examination of the role of conscious awareness in the elicitation of the P300 component
Aaron Karst, University of Wisconsin Oshkosh, Brittany Burgess, University of Wisconsin Oshkosh
METHODS: Electrophysiology

D82 - Biophoton imaging predicts the severity of psychosis symptoms in healthy adult females and not males
Victoria Hossack, Laurentian University, Michel Larivière, Laurentian University; Cameron Hourtovenko, Laurentian University Nikka Valentim, Laurentian University; Julie Juhas, Laurentian University; Blake Dotta, Laurentian University
METHODS: Electrophysiology

D83 - Neurophysiological fingerprinting differs in content but not accuracy across the adult lifespan
Jason da Silva Castanheira, McGill Univeristy, Alex Wiesman, McGill Univeristy; Sylvain Baillet, McGill Univeristy
METHODS: Electrophysiology

D84 - Using brains as sensors of the magnetic fields produced by other brains:
Reporting a robust and simpler method
Samuel Calmels, McGill University, Enora Jeuland, McGill University; J. Bruno Debruille, McGill University
OTHER

D85 - Using precision functional MRI to predict propagation of intracranial electrical stimulation
Christopher Cyr, Northwestern University, Ania Holubecki, Northwestern University; James Kragel, University of Chicago Sarah Lurie, Northwestern University; Aaron Kucyi, Drexel University; Christina Zelano, Northwestern University; Joel Voss, University of Chicago; Joshua Rosenow, Northwestern University; Stephan Schuele, Northwestern University; Elizabeth Johnson, Northwestern University; Rodrigo Braga, Northwestern University
OTHER

D86 - Lucid dreamers respond to auditory cues, especially following periods of high EEG theta power
Daniel Morris, Northwestern University, Karen Konkoly, Northwestern University; Ken Paller, Northwestern University
OTHER

D87 - 'Picture that!' Development of a mental imagery vividness assessment
Sinead Doogan, Belmont University, Katja Gehr, Belmont University; Jillian Graham, Belmont University Raul Rodriguez-Calvillo, Belmont University; Ingrid Quezada Mendoza, Belmont University; Michael Oliver, Belmont University; Carole Scherling, Belmont University
OTHER

D88 - Multivariate cognitive fingerprints of Parkinson?s disease and REM sleep behavioural disorder
Maria Balaet, Imperial College London,
OTHER

D89 - Scalable Methods to Produce Lucid Dreams: A Large Scale Trial of Targeted Lucidity Reactivation
Nathan Whitmore, Massachusetts Institute of Technology, Karen Konkoly, Northwestern Unviersity; Christopher Mazurek, Northwestern University Ken Paller, Northwestern University
OTHER

D90 - Visual mental imagery: an English-language assessment battery for different perceptual and imagery domains
Chloe Lambert, Columbia University, Chloe Lambert, Columbia University; Jianghao Liu, Sorbonne UniversitŽ, Institut du Cerveau - Paris Brain Inst Paolo Bartolomeo, Sorbonne UniversitŽ, Institut du Cerveau - Paris Brain Inst; Conor Shatto, Columbia University; Alfredo Spagna, Columbia University
OTHER

D91 - Progesterone Fluctuations Differentially Modulate Inter- and Intrahemispheric Functional Connectivity of the Inferior Frontal Gyrus
Selin Bekir, University of California Santa Barbara, Tyler Santander, University of California Santa Barbara; Laura Pritschet, University of California Santa Barbara Emily Goard Jacobs, University of California Santa Barbara; Michael Miller, University of California Santa Barbara
OTHER

D92 - Resting-state aperiodic neural activity as a novel objective marker of excessive sleepiness
Zachariah Cross, Northwestern University, Teng Kang, Royal Adelaide Hospital; Kurt Lushington, University of South Australia Paroma Sarkar, Royal Adelaide Hospital; Parmjit Singh, Royal Adelaide Hospital; Sonya Johnston, Royal Adelaide Hospital; Aeneas Yeo, Royal Adelaide Hospital; Alex Chatburn, University of South Australia
OTHER

D93 - Sleep duration can be linked to declarative memory performance but not to attention in elementary school children
Sara Studte, Carl von Ossietzky University Oldenburg, Anna Haase, Carl von Ossietzky University Oldenburg; Dietmar Grube, Carl von Ossietzky University Oldenburg
OTHER

D94 - The role of rapid eye movement sleep and deep sleep to solving creative problems
Kristin Sanders, University of Notre Dame, Megan Krause, University of Notre Dame; Jessica Payne, University of Notre Dame
THINKING: Problem solving

D95 - Neural Entropy in RS-EEG and its Relation to Insightful Problem-Solving
Christine Chesebrough, Drexel University, Evangelia G. Chrysikou, Drexel University; John Kounios, Drexel University
THINKING: Problem solving

D96 - Neuronal mechanism of insight-induced representational change
Maxi Becker, Humboldt University Berlin, Roberto Cabeza, Duke University
THINKING: Problem solving

D97 - Think slow, think insight
Yuhua Yu, Northwestern University, Yongtaek Oh, Drexel University; John Kounios, Drexel University Mark Beeman, Northwestern University
THINKING: Problem solving

D98 - Increased evidence accumulation as neural marker for perceived suddenness during visual insight solutions
Xinhao Wang, Humboldt University of Berlin, Maxi Becker, Humboldt University of Berlin; Roberto Cabeza, Duke University
THINKING: Problem solving

D99 - Aha! Experiences enhance learning for incidental information. New evidence supporting the insight memory advantage.
Carola Salvi, University of Texas at Austin - John Cabot University of Ro, Samuel Cooper, University of Texas at Austin; Nicole Keller, University of Texas at Austin Emily Leiker, University of Pittsburgh; Joseph Dunsmoor, University of Texas at Austin
THINKING: Problem solving

Poster Session E

Monday, March 27, 2:30 pm - 4:30 pm, Pacific Concourse

E1 - The gamma and theta networks continue to develop into adolescence during sentence processing
Mohammad Hossein Behboudi, The University of Texas at Dallas, Mandy Maguire, The University of Texas at Dallas; Stephanie Castro, The University of Texas at Dallas
LANGUAGE: Development & aging

E2 - Comparison of adult and child language-related networks during movie-viewing with whole-head fNIRS
Isabel Nichoson, Yale School of Medicine, Sara Sanchez-Alonso, Yale School of Medicine; Richard Aslin, Yale School of Medicine
LANGUAGE: Development & aging

E3 - Lifespan development of semantic processing in reading
Li-Hai Tan, Shenzhen Institute of Neuroscience,
LANGUAGE: Development & aging

E4 - Input or Uptake? Statistical learning moderates the relationship between language input and vocabulary size
Julie Schneider, Louisiana State University, Tengwen Fan, Louisiana State University; Roberta Golinkoff, University of Delaware Zhenghan Qi, Northeastern University
LANGUAGE: Development & aging

E5 - Developmental stability of neural encoding of speech
Nikolay Novitskiy, The Chinese University of Hong Kong, Peggy H.Y. Chan, The Chinese University of Hong Kong; Ching Man Lai, The Chinese University of Hong Kong Shaoqi Pan, The Chinese University of Hong Kong; Ting Fan Leung, The Chinese University of Hong Kong; Simon H.S. Lam, The Chinese University of Hong Kong; Patrick C.M. Wong, The Chinese University of Hong Kong
LANGUAGE: Development & aging

E6 - The effect of Cognitive Reserve on Connected Speech in Aging
Tzu-Yu Hung, National Taipei University of Nursing and Health Sciences, Chia-Ying Lee, Institute of Linguistics, Academia Sinica, Taipei, Taiwan; Yi-Chien Liu, Cardinal Tien Hospital, Taipei, Taiwan Jong-Ling Fuh, Taipei Veterans General Hospital, Taipei, Taiwan; Hung-Chun Lin, National Taipei University of Nursing and Health Sciences; Chia-Ju Chou, Cardinal Tien Hospital, Taipei, Taiwan; Chih-Ting Chang, National Taipei University of Nursing and Health Sciences*
LANGUAGE: Development & aging

E7 - Progress in elementary school reading linked to growth of cortical responses reflecting statistical learning within visual word forms
Fang Wang, Stanford University, Fang Wang, Stanford University; Blair Kaneshiro, Stanford University Elizabeth Toomarian, Stanford University; Radhika Gosavi, Stanford University; Lindsey Hasak, Stanford University; Suanna Moron, Stanford University; Trang Nguyen, Stanford University; Anthony Norcia, Stanford University; Bruce McCandliss, Stanford University
LANGUAGE: Development & aging

E8 - Neurocognitive reserve modulates white-matter microstructure associated with language in healthy older adults
Wei-Chin Hsu, National Yang Ming Chiao Tung University, Pang-Yu Tsai, National Yang Ming Chiao Tung University; Yang-Teng Fan, Yuan Ze University Rose Ru-Whui Lee, Institute of Physics, Academia Sinica; Yuan-Hsiung Tsai, Chang Gung Memorial Hospital at Chiayi; Cheng-Hung Ko, National Chung Cheng University; James H.-Y. Tai, National Chung Cheng University; Ovid J.L. Tzeng, National Taiwan Normal University; Hsu-Wen Huang, City University of Hong Kong; Chih-Mao Huang, National Yang Ming Chiao Tung University
LANGUAGE: Development & aging

E9 - The influence of memory reactivation during sleep on vocabulary and grammar rule learning
Stacey Reyes, Western University, Laura Batterink, Western University
LANGUAGE: Lexicon

E10 - Behavioral and Neural Signatures of Sub-lexical Processing in Chinese-English Bilinguals
Yihan Chen, University of Florida, Eleonora Rossi, University of Florida
LANGUAGE: Lexicon

E11 - Tracking word planning during sentence production with ECoG
Adam Morgan, NYU School of Medicine, Werner Doyle, NYU School of Medicine; Orrin Devinsky, NYU School of Medicine Adeen Flinker, NYU School of Medicine
LANGUAGE: Lexicon

E12 - Differential patterns of brain activity are correlated with individual differences in sensitivity to morphological structure.
Joanna Morris, Providence College, Ani Alaberkyan, Providence College
LANGUAGE: Lexicon

E13 - Two weeks of classroom-based training changes neural responses for lexical access: insights into naturalistic education by bringing SSVEP and EEG into schools
Elizabeth Toomarian, Stanford University, Synapse School, Fang Wang, Stanford University; Radhika Gosavi, Stanford University, Synapse School Suanna Moron, Stanford University; Lindsey Hasak, Stanford University; Bruce McCandliss, Stanford University
LANGUAGE: Lexicon

E14 - Neural Mechanisms of Novel Word Learning Through Rhyme in Adults
Will Decker, Louisiana State University, Tengwen Fan, Louisiana State University; Eileen Haebig, Louisiana State University Julie M. Schneider, Louisiana State University
LANGUAGE: Semantic

E15 - The ERP response to semantic classification in an object recognition megastudy
Sofia E. Ortega, San Diego State University, Ian A. Martindale, San Diego State University; Emily M. Akers, San Diego State University Katherine J. Midgley, San Diego State University; Phillip J. Holcomb, San Diego State University
LANGUAGE: Semantic

E16 - Electrophysiological Changes Across Two Days of Reading - Prediction Updating, or Memory Retrieval?
Ryan Hubbard, University of Illinois Urbana-Champaign, Kara Federmeier, University of Illinois Urbana-Champaign
LANGUAGE: Semantic

E17 - Distinct neurocognitive effects of anaphoric vs. event knowledge violations
Veena Dwivedi, Brock University, Janahan Selvanayagam, Western University
LANGUAGE: Semantic

E18 - Depth of processing in reading indexed by N400: Comparing digital vs. print text reading in middle-schoolers
Paul Smith, Columbia University Teachers College, Lisa Levinson, Columbia University Teachers College; Chaille Maddox, Columbia University Teachers College Karen Froud, Columbia University Teachers College
LANGUAGE: Semantic

E19 - The N400 reflects learning and processing in the declarative memory ?what? circuit: A unifying neurocognitive model
Michael Ullman, Georgetown University, Robert Reichle, University of Texas, Austin
LANGUAGE: Semantic

E20 - Syntactic Prediction of Word Category Information in Bilinguals
Zoe Yang, University of California,
LANGUAGE: Syntax

E21 - Downstream Effects of Attentional Engagement on Syntactic Processing Difficulty
Yaqi Xu, UC Santa Cruz, Megan Boudewyn, UC Santa Cruz
LANGUAGE: Syntax

E22 - The Influence of Native Language on Motion Event Encoding: An ERP Study
Stephanie Lopez, Louisiana State University, Marcus Forest, Louisiana State University; Will Decker, Louisiana State University Julie Schneider, Louisiana State University
LANGUAGE: Syntax

E23 - Beta binaural beat reduced the processing burden of syntactic complexity by increasing the inter-hemispheric functional connectivity in the left posterior temporal region
JEAHONG KIM, the University of Texas at Dallas, Hyun-Woong KIM, the University of Texas at Dallas; Jessica KOVAR, the University of Texas at Dallas Yune Sand Lee, the University of Texas at Dallas
LANGUAGE: Syntax

E24 - Cortical regions supporting syntactic comprehension: A lesion-symptom mapping study
Nicoletta Biondo, UC Berkeley - BCBL, Maria Ivanova, UC Berkeley; Alexis Pracar, UC Berkeley Juliana Baldo, VA Northern California Health Care System; Nina Dronkers, UC Berkeley - UC Davis
LANGUAGE: Syntax

E25 - Ready for Action: Long-term Memory Triggers Covert Response Preparation at Retrieval
Manda Fischer, University of Toronto and Rotman Research Institute at Baycr, Morris Moscovitch, University of Toronto and Rotman Research Institute at Baycr; Claude Alain, University of Toronto and Rotman Research Institute at Baycr
LONG-TERM MEMORY: Priming

E26 - Repetition suppression in BOLD fMRI co-localizes with evoked EEG power increases during repeat object naming: Evidence from simultaneous EEG-fMRI
Adrian Gilmore, National Institute of Mental Health/NIH, Anna Agron, National Institute of Mental Health/NIH; Peter Molfese, National Institute of Mental Health/NIH Leonardo Claudino, National Institute of Mental Health/NIH; Vinai Roopchansingh, National Institute of Mental Health/NIH; Stephen Gotts, National Institute of Mental Health/NIH; Alex Martin, National Institute of Mental Health/NIH
LONG-TERM MEMORY: Priming

E27 - Dissociable Pupillary Response Patterns During Explicit and Implicit Memory Retrieval
Wen Jian, Brown University, Mingjian He, Massachusetts Institute of Technology; Elena K. Festa, Brown University William C. Heindel, Brown University
LONG-TERM MEMORY: Priming

E28 - The properties of personal semantics
Annick Tanguay, Vanderbilt University Medical Center, Kim ThŽriault, University of Ottawa; Vanessa Taler, University of Ottawa Louis Renoult, University of East Anglia; Patrick Davidson, University of Ottawa
LONG-TERM MEMORY: Semantic

E29 - The effect of semantic congruence in memory search is modulated by similarity: An ERP analysis of feature verification
Rebecca Cutler, The University of Texas at Austin, Seyedsoroush Mirjalili, The University of Texas at Austin; Audrey Duarte, The University of Texas at Austin
LONG-TERM MEMORY: Semantic

E30 - Functional Connectivity and Semantic Memory Success in Aging and MCI
Margaret McAllister, Duke University, Lifu Deng, Duke University; Erin Welch, Duke University Christina (SuMin) Yu, Duke University; Shenyang Huang, Duke University; Ricardo Morales Torres, Duke University; Cortney Howard, Duke University; Simon Davis, Duke University; Roberto Cabeza, Duke University
LONG-TERM MEMORY: Semantic

E31 - Cortical dimensions supporting mnemonic semantic factors
Matthew Slayton, Duke University, Shenyang Huang, Duke University; Cortney Howard, Duke University Mariam Hovhannisyan, University of Arizona; Roberto Cabeza, Duke University; Simon Davis, Duke University School of Medicine
LONG-TERM MEMORY: Semantic

E32 - Comparing script knowledge deficits between patients with ventromedial-prefrontal cortex (vmPFC) and medial temporal lobe (MTL) damage
Ariana Giuliano, University of Toronto & Rotman Research Institute, Faith Balshin, Rotman Research Institute; Morris Moscovitch, Rotman Research Institute Asaf Gilboa, Rotman Research Institute
LONG-TERM MEMORY: Semantic

E33 - Towards an understanding of the limitations of procedural learning
Keela Thomson, University of Toronto, Amy Finn, University of Toronto
LONG-TERM MEMORY: Skill Learning

E34 - Myeloarchitectonic plasticity in elite golf players' brains
Xueyun Shao, Shenzhen University,
LONG-TERM MEMORY: Skill Learning

E35 - Transfer of implicit sequence knowledge depends on perceptual features
Peigen Shu, Northwestern University, Yuan Han, Northwestern University; Paul Reber, Northwestern University
LONG-TERM MEMORY: Skill Learning

E36 - Targeted memory reactivation of auditory sequence knowledge during an afternoon nap
Y. Catherine Han, Northwestern University, Adrianna Bassard, Northwestern University; Ken A. Paller, Northwestern University Paul J. Reber, Northwestern University
LONG-TERM MEMORY: Skill Learning

E37 - Impact of chronic cannabis use on motor behavior
Shikha Prashad, Washington State University, Andrew Paek, Washington State University; Lisa Fournier, Washington State University
LONG-TERM MEMORY: Skill Learning

E38 - Cognitive Advantages Associated with Musical Experience during Development
Hilda Parra, University of California San Diego, John Iversen, University of California San Diego; Timothy Brown, University of California San Diego
METHODS: Neuroimaging

E39 - A cortical surface template for human neuroscience
Ma Feilong, Dartmouth College, Guo Jiahui, Dartmouth College; M. Ida Gobbini, Università di Bologna James V. Haxby, Dartmouth College
METHODS: Neuroimaging

E40 - Developmental Trajectories of BOLD Activation during Visuospatial Processing in Williams Syndrome
Olivia Kline, National Institutes of Health, Tiffany Nash, National Institutes of Health; J. Shane Kippenhan, National Institutes of Health Danya Adams, National Institutes of Health; Anne Ilsley, National Institutes of Health; Courtney Pfister, National Institutes of Health; Madeline Hamborg, National Institutes of Health; Michael Gregory, National Institutes of Health; Philip Kohn, National Institutes of Health; Daniel Eisenberg, National Institutes of Health; Carolyn Mervis, University of Louisville; Karen Berman, National Institutes of Health
METHODS: Neuroimaging

E41 - Visualizing the dynamics of brain representations: a comparative study
Baihan Lin, Columbia University, Nikolaus Kriegeskorte, Columbia University
METHODS: Neuroimaging

E42 - A Novel Paradigm for Model-Driven Modulation of Endogeneous Control using Transcranial Electrical Stimulation
Matthew Singh, Washington University in St. Louis, Michael Cole, Rutgers University; ShiNung Ching, Washington University in St. Louis Todd Braver, Washington University in St. Louis
METHODS: Neuroimaging

E43 - Complementary benefits of hierarchical modeling and MVPA for identifying individual differences in cognitive control
Ruiqi Chen, Washington University in St. Louis, Michael Freund, Washington University in St. Louis; Todd Braver, Washington University in St. Louis
METHODS: Neuroimaging

E44 - Striatal dopamine influences the hemodynamic response in humans
Ian Ballard, University of California, Berkeley, Ioannis Pappas, University of Southern California; Daniella Furman, University of California, Berkeley Anne Berry, Brandeis University; Robert White, Washington University in St. Louis; Andrew Kayser, University of California, San Francisco; William Jagust, University of California, Berkeley; Mark D'Esposito, University of California, Berkeley
METHODS: Neuroimaging

E45 - A longitudinal study of the relationship between sleep duration and brain volume
Akari Akiyama, Tohoku university,
METHODS: Neuroimaging

E46 - The Neural Basis of Multimedia Learning and Multimodal Processing: Social-Emotional Cues for Effective Online Learning
Yingying Peng, The Hong Kong Polytechnic University, Chanyuan Gu, The Hong Kong Polytechnic University; Ping Li, The Hong Kong Polytechnic University
METHODS: Neuroimaging

E47 - Anodal cerebellar tDCS increased cerebello-cortical connectivity with language regions in young adults
Ted Maldonado, Indiana State University, T. Bryan Jackson, Texas A&M University; Jessica Bernard, Texas A&M University
METHODS: Neuroimaging

E48 - fMRI Deconvolution Toolbox: Separating Overlapping Responses in Non-Randomized Alternating Event-Related fMRI Designs in Cognitive Neuroscience
Weigang Yi, University of California Davis, Soukhin Das, University of California Davis; Mingzhou Ding, University of Florida George R. Mangun, University of California Davis
METHODS: Neuroimaging

E49 - Neuro-DBER: A flexible neuroscience- and technology-driven framework for the Scholarship of Teaching & Learning
Conor Shatto, Columbia University, Alfredo Spagna, Columbia University in the city of New York; Xioafu He, Columbia University Medical Center Conor Shatto, Columbia University in the city of New York; Adam Brown, Columbia University in the city of New York; John Thorpe, Columbia University in the city of New York; Joshua Friedman, Columbia University in the city of New York; Junsheng Shi, Columbia University; Zhuowei Gu, New York University
METHODS: Neuroimaging

E50 - Long-term effects of psilocybin on dynamic fronto-striatal-thalamic activity
Lorenzo Pasquini, University of California San Francisco, Jakub Vohryzek, Universitat Pompeu Fabra; Anira Escrichs, Universitat Pompeu Fabra Yonatan Sanz Perl, Universitat Pompeu Fabra; Adrian Ponce, Universitat Pompeu Fabra; Sebastian Idesis, Universitat Pompeu Fabra; Taylor Lyons, Imperial College London; Leor Roseman, Imperial College London; Manesh Girn, Mac Gill University; Robin Carhart-Harris, UCSF; Morten Kringelbach, Oxford University; Adam Gazzaley, UCSF; Gustavo Deco, Universitat Pompeu Fabra
METHODS: Neuroimaging

E51 - Structure-function coupling between spontaneous cortical activity and cortical thickness across the lifespan
Maggie Rempe, Boys Town National Research Hospital, Giorgia Picci, Boys Town National Research Hospital; Nathan Petro, Boys Town National Research Hospital Chloe Casagrande, Boys Town National Research Hospital; Lauren Ott, Boys Town National Research Hospital; Samantha Penhale, Boys Town National Research Hospital; Tony Wilson, Boys Town National Research Hospital
NEUROANATOMY

E52 - In-Vivo Structural Connectivity of the Reward System Along the Hippocampal Long-Axis
Blake Elliott, Temple University, Ian Ballard, University of California Berkeley; Raana Mohyee, Temple University Ingrid Olson, Temple University; Vishnu Murty, Temple University
NEUROANATOMY

E53 - Brain white matter changes during a 1-year Antarctic winter-over mission
Nick Wellman, University of Pennsylvania, David Roalf, University of Pennsylvania; Joanne Beer, University of Pennsylvania Russell Shinohara, Univeristy of Pennsylvania; Kosha Ruparel, University of Pennsylvania; Tyler Moore, University of Pennsylvania; David Dinges, University of Pennsylvania; Alexander Stahn, University of Pennsylvania; Jad Nasrini, Emory University; Adrian Ecker, University of Pennsylvania; Mustafa Almuqbel, University of Otago; Mathias Basner, University of Pennsylvania; Ruben Gur, University of Pennsylvania
NEUROANATOMY

E54 - Representation of sustained visual content in different frequency ranges: an intracranial study
Gal Vishne, The Hebrew University of Jerusalem, Edden M. Gerber, The Hebrew University of Jerusalem; Robert T. Knight, University of California, Berkeley Leon Y. Deouell, The Hebrew University of Jerusalem
OTHER

E55 - Correlations between cerebellar subregions and behavior after neuromodulation in young adults
Thamires Magalhaes, Texas A&M University, Ted Maldonado, Department of Psychology; Bryan Jackson, Department of Psychological & Brain Sciences Ivan Herrejon, Department of Psychological & Brain Sciences; Tracey Hicks, Department of Psychological & Brain Sciences; Grace Denny, Department of Psychological & Brain Sciences; Jessica Bernard, Department of Psychological & Brain Sciences
OTHER

E56 - Longitudinal Changes in Resting-State Functional Connectivity in Older Adults
Violet Zhou, University of Michigan, Shijie Qu, University of Michigan; Esther Kim, University of Michigan Thad Polk, University of Michigan
OTHER

E57 - Higher order conditioning is mediated by phase-locked connectivity between prefrontal and temporal cortices in humans.
Prateek Dhamija, Univeristy of Toronto, Allison Wong, University of Toronto; Asaf Gilboa, University of Toronto
OTHER

E58 - Cerebellar-Basal Ganglia Networks and their Role in Cognitive and Motor Processes Across the Adult Lifespan
Ivan Herrejon, Texas A&M University, Grace Denny, Texas A&M Univeristy; Sydney Cox, N/A Thamires Magalhaes, Texas A&M University; Jessica Bernard, Texas A&M University
OTHER

E59 - Are we ovary-acting? All visuospatial abilities may not be equally affected throughout the menstrual cycle.
Audrey Wade, Belmont University, Caroline Haynes, Belmont University; Devanie Coombs, Belmont University Rainah Ackley, Belmont University; Carole Scherling, Belmont University
OTHER

E60 - The early genesis of electrophysiological networks in the infant brain is linked to later cognitive performance
Anton Tokariev, Indiana University, Pauliina YrjšlŠ, University of Helsinki; Michael Myers, Columbia University Medical Center Martha Welch, Columbia University Medical Center; Sampsa Vanhatalo, University of Helsinki; Richard Betzel, Indiana University.
OTHER

E61 - Acute exercise as a modifier of neocortical plasticity and aperiodic activity in the visual cortex
Claire Cadwallader, Monash University, Jennifer Steiniger, Monash University; Patrick Cooper, Monash University Shou-Han Zhou, Monash University; Joshua Hendrikse, Monash University; Rachael Sumner, University of Auckland; Ian Kirk, Monash University; Trevor Chong, Monash University; James Coxon, Monash University
OTHER

E62 - Structural and functional brain changes observed over the course of a human pregnancy ? a dense-sampling study
Laura Pritschet, University of California, Santa Barbara, Caitlin Taylor, University of California, Santa Barbara; Tyler Santander, University of California, Santa Barbara Evan Layher, University of California, Santa Barbara; Hannah Grotzinger, University of California, Santa Barbara; Elizabeth Chrastil, University of California, Irvine; Emily Jacobs, University of California, Santa Barbara
OTHER

E63 - Dopamine D2 receptor blockade eliminates exercise-induced changes in cortical inhibition and excitation
Dylan Curtin, Monash University, Eleanor Taylor, Monash University; Mark Bellgrove, Monash University Trevor Chong, Monash University; James Coxon, Monash University
OTHER

E64 - Changes in room acoustics engage spatial sound processing: an MMN study
Marise van Zyl, Stanford University, Takako Fujioka, Stanford University
PERCEPTION & ACTION: Audition

E65 - Voicelikeness sensitivity in dogs and humans: a comparative fMRI study
Attila Andics, Eotvos Lorand University, Anna B‡lint, Eotvos Lorand University; M‡rta G‡csi, Eotvos Lorand University
PERCEPTION & ACTION: Audition

E66 - Alterations in Olfactory Network Connectivity During Odor Identification are Related to CSF t-Tau Levels
Conner Frank, SDSU/UC San Diego Joint Doctoral Program, Abigail Albertazzi, San Diego State University; Alan De La Cruz, San Diego State University Elizabeth Robinson, San Diego State University; Claire Murphy, San Diego State University
PERCEPTION & ACTION: Development & aging

E67 - Differential impacts of varying spatial and temporal sequential regularities on Serial Reaction Time Task (SRTT): A behavioral and tDCS study
Bing Shan Wu, National Central University of Taiwan, James Hung, Linkou Chang-Gung Memorial Hospital; Erik Chang, National Central University of Taiwan
PERCEPTION & ACTION: Motor control

E68 - Spontaneous plasticity pulses associated with both disuse and overuse behavioral adaptation
Roselyne J. Chauvin, Washington University in St Louis, Dillan J. Newbold, Washington University in St Louis; Evan M. Gordon, Washington University in St Louis Ryland Miller, Washington University in St Louis; Benjamin P. Kay, Washington University in St Louis; Abraham Z. Snyder, Washington University in St Louis; Timothy O. Laumann, Washington University in St Louis; Nico U.F. Dosenbach, Washington University in St Louis
PERCEPTION & ACTION: Motor control

E69 - Bilateral reorganization of motor control network dynamics during an ipsilesional motor response in hemispheric stroke
Silvia Daun, University of Cologne and Research Center Juelich, Marina Sazhumyan, Research Center Juelich; Nils Rosjat, Research Center Juelich Eva Niessen, Faculty of Human Science, University of Cologne; Peter Weiss, Research Center Juelich; Gereon Fink, Research Center Juelich
PERCEPTION & ACTION: Motor control

E71 - Predicting reaction time from EEG: using machine learning to decode single trials
Kathryn-Mary Wakim-Takaki, Albert Einstein College of Medicine, John Foxe, University of Rochester; Sophie Molholm, Albert Einstein College of Medicine
PERCEPTION & ACTION: Motor control

E72 - Visual Speech Differently Restores Temporal and Spectral Speech Information in the Auditory Cortex
Cody Zhewei Cao, University of Michigan, G Karthik, University of Michigan; Areti Majumbar, University of Michigan Andrew Jahn, University of Michigan; David Brang, University of Michigan
PERCEPTION & ACTION: Multisensory

E73 - Non-conscious multi-sensory integration revealed in the ventriloquist effect
Elise Turkovich, University of California Santa Cruz, Soorya Sankaran, University of California Santa Cruz; Wei Dou, University of California Santa Cruz Jason Samaha, University of California Santa Cruz
PERCEPTION & ACTION: Multisensory

E74 - Prediction in the midbrain: layer-dependent pattern of human superior colliculus activity during decision-making predicts the modality of expected sensory stimulation
Danlei Chen, Northeastern University, Philip Kragel, Emory University; Lawrence Wald, Massachusetts General Hospital and Harvard Medical School Marta Bianciardi, Massachusetts General Hospital and Harvard Medical School; Tor Wager, Dartmouth University; Ajay Satpute, Northeastern University; Karen Quigley, Northeastern University; Lisa Feldman Barrett, Northeastern University; Jordan Theriault, Northeastern University
PERCEPTION & ACTION: Multisensory

E75 - Visual speech increases the decodability of phonemes in auditory cortex
Areti Majumdar, Department of Psychology - University of Michigan, Ann Arbor, Cody Zhewei Cao, Department of Psychology - University of Michigan, Ann Arbor; William Stacey, Department of Neurology - University of Michigan, Ann Arbor David Brang, Department of Psychology - University of Michigan, Ann Arbor
PERCEPTION & ACTION: Multisensory

E76 - Decoding spoken words in the early visual cortex of sighted and congenitally blind individuals
Lukasz Bola, Institute of Psychology, Polish Academy of Sciences, Marta Urbaniak, Institute of Psychology, Polish Academy of Sciences; Malgorzata Paczynska, SWPS University of Social Sciences and Humanities in Warsaw Maria Kossowska, Institute of Psychology, Polish Academy of Sciences
PERCEPTION & ACTION: Multisensory

E77 - Comparing the causal involvement of the posterior superior temporal sulcus in audiovisual facilitation versus the McGurk effect
EunSeon Ahn, University of Michigan, Jasleen Kaur, University of California San Francisco; Shawn Hervey-Jumper, University of California San Francisco Taraz Lee, University of Michigan; David Brang, University of Michigan
PERCEPTION & ACTION: Multisensory

E78 - Simulating Large-Scale Cortical Function and Resulting Behavior
Hohyun Cho, Washington University School of Medicine in St. Louis, Gerwin Schalk, Tianqiao and Chrissy Chen Institute; Peter Brunner, Washington University School of Medicine in St. Louis
PERCEPTION & ACTION: Multisensory

E79 - Shifting interpretations of multistable, ?naturalistic? stimuli
Clara Sava-Segal, Dartmouth College, Emily Finn, Dartmouth College
PERCEPTION & ACTION: Other

E80 - Individual Variability in Sensorimotor Mu Suppression to Observation of Human Actions
Alison Harris, Claremont McKenna College, Perri McElvain, Claremont McKenna College; Alvin Villarosa, Claremont McKenna College Chandlyr Denaro, Claremont McKenna College; Catherine L. Reed, Claremont McKenna College
PERCEPTION & ACTION: Other

E81 - Neural Mechanisms Of Motor Rehabilitation Through Serious Games Using Virtual Reality In Parkinson's Disease
Anna Skrzatek, Sorbonne University/Paris Brain Institute - ICM, Dijana Nuic, Sorbonne University/Paris Brain Institute - ICM; CŽcile Gallea, Sorbonne University/Paris Brain Institute - ICM Benoît BŽranger, Paris Brain Institute - ICM/Center for Neuroimaging Research; Saoussen Cherif, Sorbonne University/LabCom Brain e-Novation; Eric Bardinet, Sorbonne University/Paris Brain Institute - ICM; Marie-Laure Welter, Sorbonne University/Paris Brain Institute - ICM/CHU Rouen
PERCEPTION & ACTION: Other

E82 - An EEG Examination of Early Visual Processing in Cochlear Implant Using Children
Brett Bormann, University of California, Davis, Sharon COFFEY-CORINA, University of California, Davis; Elizabeth Pierotti, University of California, Davis Lee Miller, University of California, Davis; David Corina, University of California, Davis
PERCEPTION & ACTION: Vision

E83 - Investigating the Effect of Mental Rotation on Bistable Motion Perception
Zoe Heidenry, Columbia University in the City of New York, Alfredo Spagna, Columbia University in the City of New York
PERCEPTION & ACTION: Vision

E84 - Cross-movie prediction of individualized functional topography
Guo Jiahui, Dartmouth College, Ma Feilong, Dartmouth College; Samuel A. Nastase, Princeton University James V. Haxby, Dartmouth College; M. Ida Gobbini, Università di Bologna
PERCEPTION & ACTION: Vision

E85 - Investigating generalizable physics-based representations of soft objects in the human brain
Wenyan Bi, Yale University, Qi Lin, Yale University; Kailong Peng, Yale University Aalap Shah, Yale University; Ilker Yildirim, Yale University
PERCEPTION & ACTION: Vision

E86 - Scene Scanning enhances Perceptions of Clarity in Peripheral Visual Fields
Eric Clapham, Black Hills State University, David Zacher, Black Hills State University; Celsey Selland, Black Hills State University Dana Tribble, Black Hills State University; Kathleen Kuzmic, Black Hills State University
PERCEPTION & ACTION: Vision

E87 - On the representation of objective and subjective visible/invisible stimuli in humans via EEG-based report and no-report
Oliver James, Institute for Basic Science, Yee Joon Kim, Institute for Basic Science; Min Seok Kang, Sungkyunkwan University
PERCEPTION & ACTION: Vision

E88 - The effects of race and contrast on face perception in the continuous flashing suppression paradigm: Evidence from the N
Pei-Xuan Luo, National Central University, Denise Hsien Wu, National Central University
PERCEPTION & ACTION: Vision

E89 - Distinct neural signatures for cue- and time-dependent prioritisation in working memory
Irene Echeverria-Altuna, University of Oxford, Sage Boettcher, University of Oxford; Freek van Ede, Vrije Universiteit Amsterdam Kia Nobre, University of Oxford
PERCEPTION & ACTION: Vision

E90 - Evidence from prosopometamorphopsia and mouth-specific distortions for independent representations of individual facial features
Alexis Kidder, Dartmouth College; NIMH, Brad Duchaine, Dartmouth College
PERCEPTION & ACTION: Vision

E91 - Neural representational geometry of action in naturalistic stimuli
Jane Han, Dartmouth College, Samuel Nastase, Princeton University; James Haxby, Dartmouth College
PERCEPTION & ACTION: Vision

E92 - Perception of Signing Avatars? Movement Leads to Predictive Processing and Non-Linear Model of Mu / Alpha Frequency Power Changes
Athena Willis, Gallaudet University, Lorna Quant, Gallaudet University
PERCEPTION & ACTION: Vision

E93 - In the eye of the decider: Gaze patterns distinguish levels of mutual exclusivity in value-based choice.
Joonhwa Kim, Brown University, Romy Froemer, Brown University; Xiamin Leng, Brown University Amitai Shenhav, Brown University
THINKING: Decision making

E94 - System neglect and the neural computations for change estimate
Mu-Chen Wang, National Yang Ming Chiao Tung University, George Wu, University of Chicago; Shih-Wei Wu, National Yang Ming Chiao Tung University
THINKING: Decision making

E95 - Individual differences in subjective-value adaptation
Wan-Yu Shih, National Yang Ming Chiao Tung University, Shih-Wei Wu, National Yang Ming Chiao Tung University
THINKING: Decision making

E96 - Context effects on visual perception and reward probability estimation
Shih-Wei Wu, National Yang Ming Chiao Tung University, Hui-Ching Hsu, National Yang Ming Chiao Tung University
THINKING: Decision making

E97 - Interaction Between Habits as Action Sequences and Goal-Directed Behavior
Sascha Froelich, Technische Universitaet Dresden, Marlon Esmeyer, Freie Universitaet Berlin; Tanja Endrass, Technische Universitaet Dresden Michael Smolka, Technische Universitaet Dresden; Stefan Kiebel, Technische Universitaet Dresden
THINKING: Decision making

E98 - Neural mechanisms of cognitive effort-based decision-making: a multimethod approach
Jennifer Crawford, Washington University, Rachel Brough, Washington University; Sarah Eisenstein, Washington University Jonathan Peelle, Northeastern University; Todd Braver, Washington University.THINKING: Decision making

E99 - Apathy is associated with overweighting of effort-related dimensions of value in an everyday decision-making task
Seokhwan (Tommy) Kim, McGill University, Madeleine Sharp, McGill University; Akram Bakkour, University of Chicago Karin Foerde, Columbia University
THINKING: Decision making

E100 - Human Brain Constructs Cognitive Maps Adaptively by Re-Scaling Abstract Concepts
Hai-Tao Wu, Peking University, Qingtian Mi, Peking University; Lusha Zhu, Peking University
THINKING: Decision making

E101 - Intracranial Recordings Demonstrate Predictive Encoding of Potential Outcomes in the Human Extended Amygdala
Michael Coulter, University of California San Francisco, Adam Frank, University of California San Francisco; Tenzin Norbu, University of California San Francisco A Moses Lee, University of California San Francisco
THINKING: Decision making

E102 - Spoiler Alert! Curiosity prioritizes the information gathering process over the outcome
Abigail Hsiung, Duke University, Jia-Hou Poh, Duke University; Scott Huettel, Duke University R. Alison Adcock, Duke University
THINKING: Decision making

Poster Session F

Tuesday, March 25, 8:00 am - 10:00 am, Pacific Concourse

F1 - Working Memory Improvement Due to Changed Connectivity Metrics During Maintenance
Jenna Pablo, University of Nevada, Reno, Beau Oster, University of Nevada, Reno; Jorja Shires, University of Nevada, Reno Marian Berryhill, University of Nevada, Reno

F2 - Neural encoding of musical expectations in non-human primates
Giacomo Novembre, Italian Institute of Technology (IIT), Nathaniel Zuk, Edmond & Lily Safra Center for Brain Sciences, Hebrew Uni; Félix Bigand, Italian Institute of Technology; Eros Quarta, Sapienza Uni Rome; Stefano Grasso, Sapienza Uni Rome; Flavia Arnese, Italian Institute of Technology; Alexandra Battaglia-Mayer, Sapienza Uni Rome; Roberta Bianco, Italian Institute of Technology
ATTENTION: Auditory

F3 - Pupil Size Tracks Graded Functional States of Working Memory Maintenance
Yueying Dong, University of California, San Diego, Anastasia Kiyonaga, University of California, San Diego
EXECUTIVE PROCESSES: Working memory

F4 - The role of anticipatory attention during spoken language comprehension and its encoding in alpha amplitude modulations.
Eleonora Beier, University of California, Davis, Assaf Breska, Max Planck Institute for Biological Cybernetics; Lee Miller, University of California, Davis; Yulia Oganian, University of Tübingen; George Mangun, University of California, Davis; Tamara Swaab, University of California, Davis
ATTENTION: Auditory

F5 - Higher memory load delays motor but not visual selection from working memory
Rose Nasrawi, Vrije Universiteit Amsterdam, Mika Mautner-Rohde, Vrije Universiteit Amsterdam; Freek van Ede, Vrije Universiteit Amsterdam
EXECUTIVE PROCESSES: Working memory

F6 - Explicating the role of amygdala substructure alterations in the link between hypoleptinemia and rumination in anorexia nervosa
Marie-Louis Wronski, MASSACHUSETTS GENERAL HOSPITAL, TU Dresden, Charlotte Hohnemann, University Wuppertal; Fabio Bernardoni, TU Dresden; Stefan Diestel, University Wuppertal; Joseph King, TU Dresden; Maria Seidel, TU Dresden; Stefan Ehrlich, TU Dresden
EMOTION & SOCIAL: Emotion-cognition interactions

F7 - Strengthening of Alpha Synchronization During Working Memory Maintenance is a Neural Correlate of Cognitive Transfer
Julia Ericson, Karolinska Institutet, Torkel Klingberg, Karolinska Institutet; Nieves Ruiz Ib‡–ez, Karolinska Institutet Satu Palva, University of Helsinki; Matias Palva, University of Helsinki
EXECUTIVE PROCESSES: Working memory

F8 - Asymmetries in Self-Other Action Choice Probability and Praise/Blame Assignment During Moral Decision Making
Deborah Cesarini, Duke University, Paul McKee, Duke University; Maya Todd, Duke University; Walter Sinnott-Armstrong, Duke University; Scott Huettel, Duke University
EMOTION & SOCIAL: Other

F9 - Jointly looking to the past and the future in visual working memory
Baiwei Liu, Vrije Universiteit Amsterdam, Zampeta-Sofia Alexopoulou, Vrije Universiteit Amsterdam; Freek van Ede, Vrije Universiteit Amsterdam
EXECUTIVE PROCESSES: Working memory

F10 - Perceived Ambiguity in Human Faces: Disentangling the Effects of Social Anxiety, State and Trait Anxiety
Gerly Tamm, University of Tartu and Gent University,
EMOTION & SOCIAL: Person perception

F11 - Functional Distinctions in Phase Amplitude Coupling in Hippocampal Working Memory Networks
Samantha Gray, Northwestern University, Jack Lin, University of California, Davis; Ignacio Saez, Icahn School of Medicine at Mount Sinai Fady Girgis, University of Calgary; Stephan Schuele, Northwestern University; Joshua Rosenow, Northwestern University; Edward Change, University of California, San Fransisco; Robert Knight, University of California, Berkely; Elizabeth Johnson, Northwestern University
EXECUTIVE PROCESSES: Working memory

F12 - Consistency and diversity of brain connectivity underlying executive function tasks
Tehila Nugiel, University of North Carolina at Chapel Hill, Blaire Porter, The University of Texas at Austin; Damion Demeter, University of California San Diego; Eliya Ben-Asher, The University of Texas at Austin; Jessica Church, The University of Texas at Austin
EXECUTIVE PROCESSES: Development &aging

F13 - Delayed neural processing during working memory in people with Multiple Sclerosis
Mckenzie Haller, University at Buffalo, David Shucard, University at Buffalo; Janet Shucard, University at Buffalo Thomas Covey, University at Buffalo
EXECUTIVE PROCESSES: Working memory

F14 - Aging-related losses in dopamine D2 receptor availability are linked to working-memory decline across five years
Goran Papenberg, Karolinska Institute and Stockholm University, Nina Karalija, UmeŒ University; Alireza Salami, UmeŒ University Jarkko Johansson, UmeŒ University; Anders WŒhlin, UmeŒ University; Micael Andersson, UmeŒ University; Jan Axelsson, UmeŒ University; Douglas D. Garrett, Max Planck Institute for Human Development; Katrine Riklund, UmeŒ University; Ulman Lindenberger, Max Planck Institute for Human Development; Lars Nyberg, UmeŒ Univeristy; Lars BŠckman, Karolinska Institute and Stockholm University
EXECUTIVE PROCESSES: Working memory

F15 - Spatial scales of coding for working memory in primate lateral prefrontal cortex
Jacob Miller, Yale University, Yang Xie, Chinese Academy of Sciences; Amy Arnsten, Yale University Liping Wang, Chinese Academy of Sciences; John Murray, Yale University
EXECUTIVE PROCESSES: Working memory

F16 - Neural mechanisms supporting the relationship between working memory capacity and proactive control
Rebecca Feldman, Washington University in St. Louis, Todd Braver, Washington University in St. Louis
EXECUTIVE PROCESSES: Working memory

F17 - Dissociating the functional roles of visual and parietal cortex in representing content versus context in visual working memory
Chunyue Teng, University of Wisconsin-Madison, Bradley Postle, University of Wisconsin-Madison.
EXECUTIVE PROCESSES: Working memory

F18 - High Schizotypy Participants Exhibit A Reduced Working Memory Induced P300
Marian Berryhill, University of Nevada, Jenna Pablo, University of Nevada; Jorja Shires, University of Nevada Wendy Torrens, University of Nevada; Sarah Haigh, University of Nevada
EXECUTIVE PROCESSES: Working memory

F19 - Characterizing the role of spacing and consistency in repeated practice for task-specific learning in cognitive training
Domenico Tullo, University of California, Irvine, John Cote, University of California, Irvine; Yi Feng, University of California, Irvine Anja Pahor, Univerza v Mariboru; Y. J. He, University of California, Davis; Aaron Seitz, University of California, Riverside; Susanne Jaeggi, University of California, Irvine
EXECUTIVE PROCESSES: Working memory

F20 - Some Beneficial Effects of Screen Time on Working Memory in People with a History of mTBI
Jorja Shires, University of Nevada, Reno, Joey Castellanos, University of Nevada, Reno; Muskan Kapila, University of Nevada, Reno Marian Berryhill, University of Nevada, Reno
EXECUTIVE PROCESSES: Working memory

F21 - Working memory is composed of distinct subcomponents
Gayathri Satheesh, New York University Abu Dhabi, AJ Abdujabborov, New York University Abu Dhabi; Kartik K Sreenivasan, New York University Abu Dhabi
EXECUTIVE PROCESSES: Working memory

F22 - A single cell correlate of theta-gamma phase amplitude coupling during working memory in the human hippocampus
Jonathan Daume, Cedars-Sinai Medical Center, Jan Kaminski, Cedars-Sinai Medical Center; Nand Chandravadia, Cedars-Sinai Medical Center Yousef Salimpour, Johns-Hopkins School of Medicine; Andrea Schjetan, Krembil Research Institute; William Andersen, Johns Hopkins School of Medicine; Taufik Valiante, Krembil Research Institute; Adam Mamelak, Cedars-Sinai Medical Center; Ueli Rutishauser, Cedars-Sinai Medical Center
EXECUTIVE PROCESSES: Working memory

F23 - miR320b regulates CaMKII?-MeCP2-BDNF homeostasis: implication in the cognitive ability of adolescents
Ming-Tsan Su, National Taiwan Normal University, Li-Ching Lee, National Taiwan Normal University; Ting-Kuang Yeh, National Taiwan Normal University Chun-Yen Chang, National Taiwan Normal University
LONG-TERM MEMORY: Development & aging

F24 - Cerebrospinal Fluid Biomarkers Not Associated with Mild Cognitive Impairment Reversion in Parkinson?s Disease
Cameron Ryczek, California State University, San Bernardino, Jacob Jones, California State University, San Bernardino; Lea Hemphill, California State University, San Bernardino Haley Potter, California State University, San Bernardino
LONG-TERM MEMORY: Development & aging

F25 - Aging and the Effectiveness of Encoding Techniques
Sophia Tran, University of Waterloo, Myra Fernandes, University of Waterloo
LONG-TERM MEMORY: Development & aging

F26 - Plasma miRNAs modulated the CaMKII/MeCP2/BDNF cascade as biomarkers of cognitive ability in adolescents
Li-Ching Lee, National Taiwan Normal University/Science Education Center, Ming-Tsan Su, National Taiwan Normal University/Department of Life Science; Ting-Kuang Yeh, National Taiwan Normal University/ Science Education Center Lei Bao, Ohio State University/Department of Physics; Chun-Yen Chang, National Taiwan Normal University/Science Education Center
LONG-TERM MEMORY: Development & aging

F27 - Listen to your body: the memory benefit from interoceptive awareness across the adult lifespan
Kyoungeun Lee, UT Austin, Audrey Duarte, UT Austin
LONG-TERM MEMORY: Development & aging

F28 - Event-related potential signatures of episodic memory decline predicting progression to Alzheimer's disease in asymptomatic at-risk subjects: a longitudinal study
Filipa Raposo Pereira, Sorbonne University/ Paris Brain Institute, Maximilien Chaumon, Sorbonne University/ Paris Brain Institute; Bruno Dubois, Sorbonne University/Institute of Memory and AD Valentina La Corte, Sorbonne University/ UniversitŽ de Paris-CitŽ; Nathalie George, Sorbonne University/ Paris Brain Institute
LONG-TERM MEMORY: Development & aging

F29 - Elaboration Instruction Impacts the Relationship Between Vividness and Neural Recruitment During Emotional Memory Retrieval Across the Lifespan
Samantha Williams, Boston College, Elizabeth Kensinger, Boston College; Jaclyn Ford, Boston College
LONG-TERM MEMORY: Development & aging

F30 - Phonological and semantic incongruities in audiovisual spoken word recognition: a developmental ERP study
Elizabeth Pierotti, University of California, Davis, Sharon Coffey-Corina, University of California, Davis; Tristan D. Schaefer, University of California, Davis; David P. Corina, University of California, Davis
LANGUAGE: Development & aging

F31 - Looking for commonalities and differences in item and associative memory in mTBI and older adults.
Adam Cox, University of Waterloo, Myra Fernandes, University of Waterloo
LONG-TERM MEMORY: Development & aging

F32 - Investigating age-related impairments in associative binding
Claire Pauley, Max Planck Institute for Human Development, Anna E Karlsson, Humboldt University of Berlin; Myriam C Sander, Max Planck Institute for Human Development
LONG-TERM MEMORY: Development & aging

F33 - Distinct slow and fast theta signatures of memory formation in young hippocampi and their relationship to hippocampal structure
Yessenia Rivera, Northwestern University, Samantha Gray, Northwestern University; Qin Yin, Wayne State University Parisa Vahidi, Wayne State University; Olivia McManus, University of California, San Diego; Shifteh Sattar, University of California, San Diego; Jack Lin, University of California, Davis; Stephan Schuele, Northwestern University; Joshua Rosenow, Northwestern University; Edward Chang, University of California, San Francisco; Robert Knight, University of California, Berkeley; Noa Ofen, Wayne State University; Elizabeth Johnson, Northwestern University
LONG-TERM MEMORY: Development & aging

F34 - Sleep-related Memory Processes of Voice Familiarity in Three-Month-Old Infants
Lisa-Marie Bastian, University Tuebingen, Eva-Maria Kurz, University Tübingen; Manuela Friedrich, Humboldt University Katharina Zinke, University Tübingen; Jan Born, University Tübingen
LONG-TERM MEMORY: Development & aging

F35 - Assessing the Distinct Contributions of Medial Temporal Lobe Pathways to Item and Spatial Mnemonic Discrimination in Aging - A Longitudinal Investigation
Zsuzsanna Nemecz, ELTE Eštvšs Lor‡nd University, Budapest, Istv‡n Homolya, Research Centre for Natural Sciences, Budapest; Lili Kerekes, Research Centre for Natural Sciences, Budapest Hunor Kis, ELTE Eštvšs Lor‡nd University, Budapest; Attila Keresztes, Research Centre for Natural Sciences, Budapest
LONG-TERM MEMORY: Development & aging

F36 - Investigating age-related mnemonic representational encoding-retrieval shifts
Cortney Howard, Duke University, Lifu Deng, Duke University; Margaret McAllister, Duke University Erin Welch, Duke University; Shenyang Huang, Duke University; Christina Yu, Duke University; Ricardo Morales Torres, Duke University; Simon Davis, Duke University; Roberto Cabeza, Duke University
LONG-TERM MEMORY: Development & aging

F37 - Age differences in contextual binding
Anna Karlsson, Cabezalab, Roberto Cabeza, Cabezalab; Myriam Sander, MPIB
LONG-TERM MEMORY: Development & aging

F38 - An ERP study of the retrieval orientation and recollection for siblings and friends in the self-reference effect
SHIH-KUEN CHENG, National Central University, Yu-Chun Wang, National Central University
LONG-TERM MEMORY: Episodic

F39 - A functional role for the anterolateral entorhinal cortex in intra-item configural processing in older adults
Natalia Ladyka-Wojcik, University of Toronto, Jackson C. Liang, University of Toronto; Rosanna K. Olsen, University of Toronto; Rotman Research Institute Jennifer D. Ryan, University of Toronto; Rotman Research Institute; Morgan D. Barense, University of Toronto; Rotman Research Institute
LONG-TERM MEMORY: Episodic

F40 - When are individual elements of naturalistic events encoded?
Kevin Campion, University of Cambridge, Andrea Greve, University of Cambridge; Richard Henson, University of Cambridge Aya Ben-Yakov, Hebrew University of Jerusalem
LONG-TERM MEMORY: Episodic

F41 - Threat biases temporal-order memory judgements for short movie clips.
David F. Gregory, Temple University, Bailey C. Spangler, Temple Universioty; Vishnu P. Murty, Temple University
LONG-TERM MEMORY: Episodic

F42 - Functions of the medial temporal lobe in memory and navigation of conceptual spaces
Elias Rau, Ruhr University Bochum, Nora Herweg, Ruhr University Bochum; Rebekka Heinen, Ruhr University Bochum Nikolai Axmacher, Ruhr University Bochum
LONG-TERM MEMORY: Episodic

F43 - The long-term memory of elementary school children benefits from contextually embedded vocabulary learning
Lena Giesbrecht, Carl von Ossietzky UniversitŠt Oldenburg, Anna Haase, Carl von Ossietzky UniversitŠt Oldenburg; Dietmar Grube, Carl von Ossietzky UniversitŠt Oldenburg Sara Studte, Carl von Ossietzky UniversitŠt Oldenburg
LONG-TERM MEMORY: Episodic

F44 - Characterizing the functional brain networks underlying successful item and associative long-term memory encoding: A Meta-Analytic Functional Co-Activation Mapping study
Robert Blumenfeld, Cal Poly Pomona, Shea Duarte, University of California, Davis
LONG-TERM MEMORY: Episodic

F45 - Dissociable Cortico-Hippocampal Mechanisms Underlying Simultaneous and Sequential Memory Retrieval
Ji Sun Kim, Seoul National University, Sang Ah Lee, Seoul National University
LONG-TERM MEMORY: Episodic

F46 - Organization of temporal dynamics among hippocampal subfields as measured by single voxel autocorrelation in humans
Nichole Bouffard, University of Toronto, Morris Moscovitch Moscovitch, University of Toronto; Morgan Barense, University of Toronto
LONG-TERM MEMORY: Episodic

F47 - The role of the sub-thalamic nucleus (STN) in reactive inhibitory control of unwanted memories.
Subbulakshmi Sankarasubramanian, University of Cambridge, Dace Apsvalka, University of Cambridge; Michael Anderson, University of Cambridge
LONG-TERM MEMORY: Episodic

F48 - First-gaze differentiation of item and relational memory strength
Jonathon Whitlock, University of Illinois at Urbana-Champaign, Lili Sahakyan, University of Illinois at Urbana-Champaign
LONG-TERM MEMORY: Episodic

F49 - Memory Suppression Relies on Targeted Representational Control of Individual Memories
Frederik Bergmann, University of Cambridge, Moataz Assem, University of Cambridge; Nikolaus Kriegeskorte, Columbia University Michael Anderson, University of Cambridge
LONG-TERM MEMORY: Episodic

F50 - Behavioral and neural correlates of visual statistical learning during n-back working memory performance
Hwamee Oh, Brown University, Shanti Mechery, Brown University
LONG-TERM MEMORY: Other

F51 - Memory training with realistic stimuli improves autobiographical memory performance in older adults.
Tory Worth, Duke University, Tuila Felinto, Duke University
LONG-TERM MEMORY: Other

F52 - Modulating the Control of Value-Directed Remembering with Transcranial Direct Current Stimulation (tDCS) of Prefrontal Cortex
Sonya Ashikyan, University of California, Los Angeles, Henri De Guzman, University of California, Los Angeles; Sonya Ashikyan, University of California, Los Angeles Chloe Retika, University of California, Los Angeles; Alan Castel, University of California, Los Angeles; Jesse Rissman, University of California, Los Angeles; Barbara Knowlton, University of California, Los Angeles
LONG-TERM MEMORY: Other

F53 - The intraparietal sulcus may play a domain-specific role in criterion shifting during recognition memory versus visual detection tests
Evan Layher, UC Santa Barbara, Miguel Eckstein, UC Santa Barbara; Michael Miller, UC Santa Barbara
LONG-TERM MEMORY: Other

F54 - The Effects of Hierarchically Graded Feature Overlap on False Recognition: Perceptual and Conceptual Contributions to Familiarity Along the Ventral Visual Pathway
Pedro Espinosa de Villafranca, Humboldt-UniversitŠt zu Berlin, Loris Naspi, Humboldt-UniversitŠt zu Berlin; Erik Wing, Rotman Research Institute Roberto Cabeza, Duke University
LONG-TERM MEMORY: Other

F55 - Ventral Medial Prefrontal Cortex Lesions Impair Pre-conscious Action-Intention Superiority, but Not Cue Detection in Prospective Memory
Victoria Liu, University of Toronto, Randy McIntosh, Simon Fraser University; Asaf Gilboa, University of Toronto
LONG-TERM MEMORY: Other

F56 - Situating the parietal memory network in the context of multiple parallel distributed networks within the individual using high-resolution 7T functional connectivity
Young Hye Kwon, Northwestern University, Joey J. Salvo, Northwestern University; Maya Lakshman, Northwestern University Kendrick Kay, University of Minnesota; Caterina Gratton, Florida State University; Rodrigo M. Braga, Northwestern University
LONG-TERM MEMORY: Other

F57 - Cortical and subcortical mechanisms of orthographic learning
Yuan Tao, Johns Hopkins University, Teressa Schubert, Springer Nature Group; Brenda Rapp, Johns Hopkins University
LONG-TERM MEMORY: Other

F58 - Instructed Motivational States Bias Reinforcement Learning and Memory Formation
Alyssa Sinclair, Duke University, Yuxi Wang, Duke University; R. Alison Adcock, Duke University
LONG-TERM MEMORY: Other

F59 - Investigating representations formed by implicit and explicit learning
Priya Kalra, University of Western Ontario, J. Paul Minda, University of Western Ontario; Laura Batterink, University of Western Ontario Marc Joanisse, University of Western Ontario
LONG-TERM MEMORY: Other

F60 - Separate representations of order and rhythm acquired in implicit perceptual-motor sequence learning
Ziyan Han, Northwestern University, Y. Catherine Han, Northwestern University; Peigen Shu, Northwestern University Paul J. Reber, Northwestern University
LONG-TERM MEMORY: Skill Learning

F61 - Meditation as a cognitive training tool: evidence from individual performance enhancement and resting-state EEG activity.
Chloe Dziego, University of South Australia, Ina Bornkessel-Schlesewsky, University of South Australia; Zachariah Cross, University of South Australia Maarten Immink, Flinders University; Matthias Schlesewsky, University of South Australia
LONG-TERM MEMORY: Skill Learning

F62 - Differential Transfer of Sequence-Specific and Task-General Knowledge in Implicit Motor Sequential Skill Learning
Antonio Santa Cruz, Northwestern University, Peigen Shu, Northwestern University; Y. Catherine Han, Northwestern University Paul Reber, Northwestern University
LONG-TERM MEMORY: Skill Learning

F63 - Stereotypical Hippocampal Clustering Predicts Navigational Success in Virtualized Real-World Environments
Jason Ozubko, SUNY Geneseo, Madelyn Campbell, SUNY Geneseo; Abigail Verhayden, SUNY Geneseo
LONG-TERM MEMORY: Other

F64 - Auditory stimulation during sleep-related brain oscillations and its effects on learning
Hugo R. Jourde, Concordia University, Katerina Z. Sita, Concordia University; Zseyvfin Eyqvelle, Concordia University Mary Brooks, Concordia University; Emily B.J. Coffey, Concordia University
LONG-TERM MEMORY: Skill Learning

F65 - Learning to code recycles representations of logical algorithms in fronto-parietal network
Yun-Fei Liu, Johns-Hopkins University, Colin Wilson, Johns Hopkins University; Marina Bedny, Johns Hopkins University
THINKING: Reasoning

F66 - The interdependence of emotional valence and expectedness in memory
Aisha Mukhtar, University of Manchester,

F67 - Beyond the Grand Average: A Novel Method for Identifying Single-Trial ERP Components in EEG Research
Brian Kraus, Northwestern University,
METHODS: Electrophysiology

F68 - Which One Do I Choose? An Evaluation of Mobile EEG Systems
Olave Krigolson, University of Victoria, Katherine Boere, University of Victoria; Mathew Hammerstrom, University of Victoria; Gordon Binsted, York University
METHODS: Electrophysiology

F69 - Real-time antidepressant availability in the human brain using A machine learning enhanced voltammetric approach
Nishika Raheja, Virginia Tech, Read Montague, Virginia Tech; Seth Batten, Virginia Tech; Terry Lohrenz, Virginia Tech; Thomas Twomey, Virginia Tech
METHODS: Other

F71 - Deviations from typical brain parameters of neural oscillations change their patterns with ageing
Hayyan Liaqat, Simon Fraser University, Vasily Vakorin, Simon Fraser University; Sam Doesburg, Simon Fraser University; Sylvain Moreno, Simon Fraser University
OTHER

F72 - Gamma Oscillations during Visuomotor Processing in Children with Autism Spectrum Disorders
KyungMin An, University of Birmingham,
PERCEPTION & ACTION: Audition

F73 - Entrainment to Rhythms in Autism Spectrum Disorder
Shlomit Beker, Albert Einstein College of Medicine, John Foxe, University of Rochester; Elizabeth Akinyemi, Albert Einstein College of Medicine; Sophie Molholm, Albert Einstein College of Medicine
PERCEPTION & ACTION: Development & aging

F74 - Feedforward control of speech in the cerebellum
Kyunghee X. Kim, University of California San Francisco, Ashley A. Tay, University of California San Francisco; Corby L. Dale, University of California San Francisco; Joshua O. Chon, University of California San Francisco; Srikantan S. Nagarajan, University of California San Francisco; John F. Houde, University of California San Francisco
PERCEPTION & ACTION: Motor control

F75 - Towards Enhancing Meditation with Focused Ultrasound Neuromodulation in Expert Meditators
Joshua Cain, Institute for Advanced Consciousness Studies (IACS), Tracy Brandmeyer, Institute for Advanced Consciousness Studies (IACS); Ninette Simonian, Institute for Advanced Consciousness Studies (IACS); Nicco Reggente, Institute for Advanced Consciousness Studies (IACS)
PERCEPTION & ACTION: Multisensory

F76 - Category-specific representation of numbers and letters is distributed across neural systems
Ruizhe Liu, Stanford University, Hyesang Chang, Stanford University; Dawlat El-said, Stanford University; Yuan Zhang, Stanford University; Demian Wassermann, INRIA (Saclay Île-de-France); Vinod Menon, Stanford University
PERCEPTION & ACTION: Other

F77 - Dynamics of number processing levels as emerging at different paces of presentation: an SSVEP study.
Amandine Van Rinsveld, Stanford University, Blair Kaneshiro, Stanford University; Mathieu Guillaume, Stanford University; Anthony Norcia, Stanford University; Bruce McCandliss, Stanford University
PERCEPTION & ACTION: Other

F78 - Integrated perceptual decisions rely on parallel evidence accumulation
Dragan Rangelov, The University of Queensland, Julia Fellrath, The University of Lausanne; Jason Mattingley, The University of Queensland
THINKING: Decision making

F79 - Beta and theta track effort and reward context in human prefrontal and basal ganglia circuits during decision making
Colin Hoy, University of California San Francisco, Coralie de Hemptinne, University of Florida; Masud Husain, University of Oxford; Philip Starr, University of California San Francisco; Simon Little, University of California San Francisco
THINKING: Decision making

F80 - Dynamic causal interactions in brain circuits underlying numerical processing from childhood to adolescence

Yuan Zhang, Stanford University School of Medicine, Ruizhe Liu, Stanford University School of Medicine; Hyesang Chang, Stanford University School of Medicine; Vinod Menon, Stanford University School of Medicine

THINKING: Other

F81 - Causal Evidence for the Processing of Bodily Self in the Anterior Precuneus

Dian Lou, Laboratory of Behavioral and Cognitive Neuroscience, Human Intracranial Cognitive Electrophysiology Program, Departments of Neurology and Neurological Sciences; James R. Stieger, Laboratory of Behavioral and Cognitive Neuroscience, Human Intracranial Cognitive Electrophysiology Program, Departments of Neurology and Neurological Sciences; Cindy Xin, Laboratory of Behavioral and Cognitive Neuroscience, Human Intracranial Cognitive Electrophysiology Program, Departments of Neurology and Neurological Sciences; Eileen Ma, Laboratory of Behavioral and Cognitive Neuroscience, Human Intracranial Cognitive Electrophysiology Program, Departments of Neurology and Neurological Sciences; Mariel Kalkach Aparicio, Laboratory of Behavioral and Cognitive Neuroscience; Katherine Werbaneth, Laboratory of Behavioral and Cognitive Neuroscience, Human Intracranial Cognitive Electrophysiology Program, Departments of Neurology and Neurological Sciences; Zoe Lusk, Laboratory of Behavioral and Cognitive Neuroscience, Human Intracranial Cognitive Electrophysiology Program, Departments of Neurology and Neurological Sciences; Claire M. Perry, Laboratory of Behavioral and Cognitive Neuroscience, Human Intracranial Cognitive Electrophysiology Program, Departments of Neurology and Neurological Sciences; Karl Deisseroth, Psychiatry, Howard Hughes Medical Institute; Vivek Buch, Human Intracranial Cognitive Electrophysiology Program, Neurosurgery; Josef Parvizi, Laboratory of Behavioral and Cognitive Neuroscience, Departments of Neurology and Neurological Sciences, Neurosurgery

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