

**MARCH 24 - 27, 2018**



# Cognitive Neuroscience Society

25th Annual Meeting, March 24-27, 2018  
Sheraton Hotel, Boston, Massachusetts

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# 2018 Committees & Staff

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Becky Gazzaniga, Event Associate  
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Carmen Conroy, Event Associate

# Schedule Overview

## Saturday, March 24, 2018

11:00 am- 1:30 pm	Exhibitor Check In, <i>Exhibit Hall C</i>
11:00 am – 6:30 pm	On-site Registration & Pre-Registration Check In, <i>Grand Ballroom Foyer</i>
12:00 – 1:30 pm	<b>Data Blitz Session 1</b> , <i>Back Bay A&amp;B</i> <b>Data Blitz Session 2</b> , <i>Back Bay C&amp;D</i> <b>Data Blitz Session 3</b> , <i>Grand Ballroom</i>
1:00 pm – 1:30 pm	Poster Session A Set-Up, <i>Exhibit Hall C</i>
1:30 – 3:30 pm	Poster Session A, <i>Exhibit Hall C</i>
1:30 – 5:30 pm	Exhibits Open, <i>Exhibit Hall C</i>
2:45 – 3:15 pm	Coffee Service, <i>Exhibit Hall C</i>
3:30 – 5:30 pm	<b>Big Theory versus Big Data: What Will Solve the Big Problems in Cognitive Neuroscience?</b> David Poeppel, <i>Grand Ballroom</i>
▶ 3:30 – 4:00 pm	<b>Talk 1:</b> The Important of the Small for Understanding the Big, Eve Marder
▶ 4:00 – 4:30 pm	<b>Talk 2:</b> Which Presents the Biggest Obstacle to Advances in Cognitive Neuroscience Today: Lack of Theory or Lack of Data? Jack Gallant
▶ 4:30 – 5:00 pm	<b>Talk 3:</b> Data Driven Everything, Alona Fyshe
▶ 5:00 – 5:30 pm	<b>Talk 4:</b> Neuroscience, Deep Learning, and the Urgent Need for an Enriched Set of Computational Primitives, Gary Marcus
5:30 – 6:30 pm	Keynote Address, <b>The Consciousness Instinct</b> , Michael S. Gazzaniga, University of California, Santa Barbara, OPEN TO THE PUBLIC (Q&A to follow), <i>Grand Ballroom</i>
5:15 – 5:30 pm	Poster Session A Take-Down, <i>Exhibit Hall C</i>
5:30 pm	Exhibit Hall Closed for the Day – No Entry
6:30 – 7:30 pm	Welcome Reception, <i>Grand Ballroom Foyer</i>

## Sunday, March 25, 2018

7:30 – 8:00 am	Exhibit Hall Access for Exhibitors/Poster Session B Set-up Only, <i>Exhibit Hall C</i>
7:30 am – 5:30 pm	On-site Registration & Pre-Registration Check In, <i>Grand Ballroom Foyer</i>
8:00 – 8:30 am	Continental Breakfast, <i>Exhibit Hall C</i>
8:00 – 10:00 am	Communications Open House, Press Room, <i>Kent</i>
8:00 – 10:00 am	Poster Session B, <i>Exhibit Hall C</i>
8:00 am – 5:00 pm	Exhibits Open, <i>Exhibit Hall C</i>
10:00 am – 12:00 pm	Invited Symposium 1 <b>From Cage to Clinic: Integrative Neuroscience to Understand and Improve Cognition and Emotion Function in Healthy and Clinical Populations</b> , Cindy Lustig, Chair, <i>Back Bay ABCD</i>
▶ 10:00 – 10:24 am	<b>Talk 1:</b> From Top-Down to “Bottoms-Up”: Converging Approaches to Understand the Neural Systems Involved in Attention and Cognitive Control, Cindy Lustig
▶ 10:24 – 10:48 am	<b>Talk 2:</b> Bridging the Translational Gap Using Touchscreens: Attention and Memory in Neurodegenerative and Neuropsychiatric Disease, Tim Bussey
▶ 10:48 – 11:12 am	<b>Talk 3:</b> Graph Theory as a Translational Bridge to Understand Cognitive and Emotional Development, Damien Fair
▶ 11:12 – 11:36 am	<b>Talk 4:</b> Building on Animal Models to Understand Mechanisms of Threat Control in Humans, Elizabeth Phelps
▶ 11:36 – 12:00 pm	<b>Talk 5:</b> Q&A Period, The Speakers will take Questions from the Audience.
10:00 – 12:00 pm	Invited Symposium 2 – <b>“Human and Machine Cognition – The Deep Learning Challenge”</b> , Nikolaus Kriegeskorte, Chair, <i>Grand Ballroom</i>
▶ 10:00 – 10:24 am	<b>Talk 1:</b> Introduction to Deep Learning for Cognitive Neuroscientists, Nikolaus Kriegeskorte
▶ 10:24 – 10:48 am	<b>Talk 2:</b> Deep Net Models of Vision: Architecture and Domain-Specific Training, Katherine Storrs

- ▶ 10:48 – 11:12 am **Talk 3:** Analysis-By-Synthesis – Efficient Inverse Graphics in Biological Face Processing Systems, Ilker Yildirim
- ▶ 11:12 – 11:36 am **Talk 4:** The Transparency of Deep Learning Networks, Aude Oliva
- ▶ 11:36 – 12:00 pm **Talk 5:** Q&A Period, The Speakers will take Questions from the Audience.
- 11:30 – 11:45 am Poster B Take-Down, *Exhibit Hall C*
- 12:00 – 1:00 pm Lunch Break (On your own)
- 12:00 – 1:00 pm Poster C Set-Up, *Exhibit Hall C*
- 1:00 – 3:00 pm Poster Session C, *Exhibit Hall C*
- 2:30 – 3:00 pm Coffee Service, *Exhibit Hall C*
- 3:00 – 5:00 pm Symposium 1 **Memory Modulation via Direct Brain Stimulation in Humans**, Cory Inman, Chair, *Back Bay A&B*
- ▶ 3:00 – 3:24 pm **Talk 1:** Electrical Stimulation of Entorhinal Cortex and Hippocampus Impairs Temporal and Allocentric Representations in Human Episodic Memory, Josh Jacobs
- ▶ 3:24 – 3:48 pm **Talk 2:** Network-Based Brain Stimulation Selectively Impairs Spatial Retrieval, Nitin Tandon
- ▶ 3:48 – 4:12 pm **Talk 3:** Advancements in Intracranial Stimulation of the Entorhinal Area for Enhancement of Episodic Memory, Nanthia Suthana
- ▶ 4:12 - 4:36 pm **Talk 4:** Closed-Loop Stimulation of Temporal Cortex Rescues Functional Networks and Improves Memory, Youssef Ezzyat
- ▶ 4:36 – 5:00 pm **Talk 5:** Direct Electrical Stimulation of the Amygdala Enhances Event-Specific Declarative Memory in Humans, Cory Inman
- 3:00 – 5:00 pm Symposium 2 **Understanding Human Visual Cognition Through Multivariate and Computational Analysis of MEG and EEG Data**, Radoslaw Martin Cichy, Chair, *Back Bay C&D*
- ▶ 3:00 - 3:24 pm **Talk 1:** Oscillatory Dynamics of Perceptual to Conceptual Representations in the Ventral Visual Pathway, Alex Clarke
- ▶ 3:24 – 3:48 pm **Talk 2:** Fast, Invariant Representations for Human Action in the Visual System, Leyla Isik
- ▶ 3:48 – 4:12 pm **Talk 3:** Comparing Dynamics of Processing Streams in Blind and Sighted Readers, Santani Teng
- ▶ 4:12 – 4:36 pm **Talk 4:** Identifying the Neural Architecture of Perceptual Decision Making with Normative, Shallow and Deep Neural Network Approaches, Jean-Rémi King
- ▶ 4:36 – 5:00 pm **Talk 5:** Unique Aspects of Human Object Processing Revealed by MEG and EEG, Dimitrios Pantazis
- 3:00 – 5:00 pm Symposium 3 **The Next 25 Years of Cognitive Neuroscience: Opportunities and Challenges**, Brad Postle, Chair, *Grand Ballroom*
- ▶ 3:00 – 3:24 pm **Talk 1:** Grounding Models of Neural Function in First Principles, Gyorgy Buzsaki
- ▶ 3:24 – 3:48 pm **Talk 2:** Neural Dynamics, Recurrent Neural Networks and the Problem of Time, Dean Buonomano
- ▶ 3:48 – 4:12 pm **Talk 3:** Field potentials, fMRI, and the Order of Operations: Why the Two Measures are Blind to Different Parts of the Neuronal Responses, Dora Hermes
- ▶ 4:12 – 4:36 pm **Talk 4:** Establishing Neural Principles of Dynamic and Interactive Social Behaviors, Steve Chang
- ▶ 4:36 – 5:00 pm **Talk 5:** Is lesion Analysis still Relevant for Contemporary Cognitive Neuroscience? Nina Dronkers
- 4:45 – 5:00 pm Poster Session C Take-Down, *Exhibit Hall C*
- 5:00 – 6:00 pm 25<sup>th</sup> Annual George A. Miller Prize in Cognitive Neuroscience Lecture, **Objects, Agents, and Persons: From Core Cognition to New Systems of Knowledge**, Elizabeth Spelke, *Grand Ballroom*
- 5:00 pm Exhibit Hall Closed for the Day – No Entry
- 6:30 pm **CNS 25<sup>th</sup> Anniversary Gala**, Tickets Required, *Constitution Ballroom*

## Monday, March 26, 2018

- 7:30 – 8:00 am Exhibit Hall Access for Exhibitors/Poster Session D Set-Up Only, *Exhibit Hall C*
- 8:00 – 8:30 am Continental Breakfast, *Exhibit Hall C*
- 8:00 – 10:00 am Communications Open House, Press Room, *Kent*
- 8:00 – 10:00 am Poster Session D, *Exhibit Hall C*
- 8:00 – 5:30 pm On-site Registration & Pre-Registration Check In, *Grand Ballroom Foyer*
- 8:00 – 5:45 pm Exhibits Open, *Exhibit Hall C*

10:00 – 12:00 pm	Symposium 4 <b>Episodic Memory Formation: From Neural Circuits to Behavior</b> , Gabriel Kreiman, Chair, Ueli Rutishauser, Co-Chair, <i>Grand Ballroom</i>
▶ 10:00 – 10:24 am	<b>Talk 1:</b> Introduction + In Memoriam for John Lisman + Episodic Memory Formation in Real Life, Gabriel Kreiman
▶ 10:24 – 10:48 am	<b>Talk 2:</b> Probing the Circuitry of Human Declarative Memory at the Single-Neuron Level, Ueli Rutishauser
▶ 10:48 – 11:12 am	<b>Talk 3:</b> Neural Coding of Space and Time for Episodic Memory, Michael Hasselmo
▶ 11:12 – 11:36 am	<b>Talk 4:</b> Imagination, Creativity, and Episodic Retrieval, Daniel Schacter
▶ 11:36 – 12:00 pm	<b>Talk 5:</b> What is an ‘Episode’ in Episodic Memory? Moving Beyond a Single Moment to Understanding How Temporally Extended Episodic Memories are Constructed from Ongoing Experience, Lila Davachi
10:00 am – 12:00 pm	Symposium 5 <b>Are We All Chained to the Rhythm? Periodicity in Human Perception and Behavior</b> , Benedikt Zoefel, Chair, <i>Back Bay A&amp;B</i>
▶ 10:00 – 10:24 am	<b>Talk 1:</b> Temporal Organization of Multiple Objects in Bottom-Up and Top-Down Attention, Huan Luo
▶ 10:24 – 10:48 am	<b>Talk 2:</b> A Dynamic Interplay within the Frontoparietal Network Underlies Rhythmic Spatial Attention, Ian C. Fiebelkorn
▶ 10:48 – 11:12 am	<b>Talk 3:</b> The Rhythms of Sensorimotor Integration: Action Planning and Perceptual Oscillations, Alessandro Benedetto
▶ 11:12 – 11:36 am	<b>Talk 4:</b> Can we Find Auditory Perceptual Cycles?, Benedikt Zoefel
▶ 11:36 – 12:00 pm	<b>Talk 5:</b> Extended Discussion
10:00 am – 12:00 pm	Symposium 6 <b>Top-Down Attention to Time: A neural Oscillatory Perspective</b> , Malte Wöstmann, Chair, <i>Back Bay C&amp;D</i>
▶ 10:00 – 10:24 am	<b>Talk 1:</b> Rhythmic Facilitation of Temporal Attention as Revealed by Psychophysics and MEG, Saskia Haegens
▶ 10:24 – 10:48 am	<b>Talk 2:</b> EEG Power and Phase Influence Trial-By-Trial Behavioral Responses in a Temporal Association Task, Sanne ten Oever
▶ 10:48 – 11:12 am	<b>Talk 3:</b> Neural Tracking of Different Temporal Scales of Speech Predicts Successful Speech-in-Noise Comprehension, Anne Keitel
▶ 11:12 – 11:36 am	<b>Talk 4:</b> Stimulating the Neural Oscillatory Dynamics of Auditory Attention to Time and Space, Malte Wöstmann
▶ 11:36 – 12:00 pm	<b>Talk 5:</b> Oscillatory Brain Activity Determines the Timescale of Human Cognition, Randolph Helfrich
10:00 am – 12:00 pm	Symposium 7 <b>Developmental Cognitive Neuroscience: Brain Construction from the Fetus through Old Age</b> , Nim Tottenham, Chair, <i>Constitution Ballroom</i>
▶ 10:00 – 10:24 am	<b>Talk 1:</b> Stress of a Mother is Reflected in the Developing Brain of her unborn Child, Moriah E. Thomason
▶ 10:24 – 10:48 am	<b>Talk 2:</b> Cortico-Amygdala Connectivity Development: The Importance of Childhood, Nim Tottenham
▶ 10:48 – 11:12 am	<b>Talk 3:</b> The Developing Adolescent Brain: Insights from Cognitive Neuroscience, Adriana Galvan
▶ 11:12 – 11:36 am	<b>Talk 4:</b> Mapping Changes in Brain Areal Organization across Development and Beyond, Ting Xu
▶ 11:36 – 12:00 pm	<b>Talk 5:</b> Q&A Period
11:30 – 11:45 am	Poser Session D Take-Down, <i>Exhibit Hall C</i>
12:00 – 1:30 pm	Lunch Break ( <i>On your own</i> )
12:15 – 1:15 pm	Workshop <b>Latest Need to Know Re: NIH Funding Plus Training, Career and Research Grant Opportunities</b> , Kathy Mann Koepke, NICHD/NIH, <i>Back Bay A&amp;B</i>
1:30 – 2:00 pm	Poster Session E Set-Up, <i>Exhibit Hall C</i>
1:30 – 2:00 pm	YIA 1 <b>The Interface of Memory and Perception</b> , Morgan Barense, <i>Constitution Ballroom</i>
2:00 – 2:30 pm	YIA 2 <b>Deconstructing Episodic Memory: An Information Processing Approach</b> , Mike Yassa, <i>Constitution Ballroom</i>
2:30 – 4:30 pm	Poster Session E, <i>Exhibit Hall C</i>
3:30 – 4:00 pm	Coffee Service, <i>Exhibit Hall C</i>
4:30 – 5:30 pm	The Fred Kavli Distinguished Career Contributions in Cognitive Neuroscience Lecture, <b>The Representation of Objects in the Brain: Nature or Nurture</b> , Alfonso Caramazza, <i>Grand Ballroom</i>
5:30 – 5:45 pm	Poster Session E Take-Down, <i>Exhibit Hall C</i>
5:45 – 7:15 pm	<b>CNS Trainee Professional Development Panel</b> , <i>Constitution Ballroom</i>
5:45 pm	Exhibit Hall Closed for the Day – No Entry
7:30 – 10:30 pm	CNS Student Trainee Social Night, Dillon’s

## Tuesday, March 27, 2018

- 7:30 – 8:00 am Exhibit Hall Access for Exhibitors/Poster Session F Set-Up Only, *Exhibit Hall C*
- 8:00 – 8:30 am Continental Breakfast, *Exhibit Hall C*
- 8:00 – 10:00 am Poster Session F, *Exhibit Hall C*
- 8:00 am – 12:00 pm Exhibits Open, *Exhibit Hall C*
- 8:00 am – 3:00 pm On-site Registration & Pre-Registration Check In. *Grand Ballroom Foyer*
- 10:00 am – 12:00 pm Invited Symposium 3 **Neural Mechanisms of Adaptive Forgetting**, Michael Anderson, Chair, *Back Bay ABCD*
- ▶ 10:00 – 10:24 am **Talk 1:** A Species-General Retrieval-Specific Mechanism of Adaptive Forgetting, Michael C. Anderson
  - ▶ 10:24 – 10:48 am **Talk 2:** Remembering Causes Adaptive Forgetting of Cortical Memory Traces, Maria Wimber
  - ▶ 10:48 – 11:12 am **Talk 3:** Molecular Neurobiology of Active Forgetting, Ronald L. Davis
  - ▶ 11:12 – 11:36 am **Talk 4:** The Persistence and Transience of Memory, Paul Frankland
  - ▶ 11:36 – 12:00 pm **Talk 5:** Q&A Period, The Speakers will take Questions from the Audience.
- 10:00 am – 12:00 pm Invited Symposium 4 **What Makes Musical Rhythm Special: Cross-Species, Developmental, and Social Perspectives**, Jessica Grahn, Chair, *Constitution Ballroom*
- ▶ 10:00 – 10:24 am **Talk 1:** Neural Adaptation May Set the Stage for the Perception of Musical Beat, Vani G. Rajendran
  - ▶ 10:24 – 10:48 am **Talk 2:** Predicting “When” in Rhythm: Neural Mechanisms Underlying Beat-Based and Memory-Based Expectations, Fleur L. Bouwer
  - ▶ 10:48 – 11:12 am **Talk 3:** Live Music Increases Intersubject Synchronization of Audience Members’ Brain Rhythms, Molly J. Henry
  - ▶ 11:12 – 11:36 am **Talk 4:** Musical Rhythms in Infancy: Social and Emotional Effects, Laura Cirelli
  - ▶ 11:36 – 12:00 pm **Talk 5:** Q&A Period, The Speakers will take Questions from the Audience.
- 11:45 am – 12:00 pm Poster Session F Take-Down, *Exhibit Hall C*
- 12:00 pm Exhibit Hall Closed for the Day – No Entry
- 12:00 – 1:30 pm Lunch Break (*On your own*)
- 1:30 pm – 3:30 pm Symposium 8 **Mechanisms of Sleep’s Role in Memory and Emotion Processing**, Rebecca Spencer, Chair, Jan Born, Co-Chair, *Back Bay A&B*
- ▶ 1:30 – 1:54 pm **Talk 1:** Investigating Autonomic and Central Nervous System Contributions to Memory Consolidation during Sleep, Sara C. Mednick
  - ▶ 1:54 – 2:18 pm **Talk 2:** Interacting Effects of Emotional and Episodic Memory Consolidation During Sleep, Jan Born
  - ▶ 2:18 – 2:42 pm **Talk 3:** Preferential Consolidation of Emotionally Salient Information During a Nap is Preserved in Middle Age, Jessica Payne
  - ▶ 2:42 – 3:06 pm **Talk 4:** Changes in Sleep-dependent Emotional Memory Processing with Aging and Development, Rebecca Spencer
  - ▶ 3:06 – 3:30 pm **Talk 5:** Facilitated Discussion, Rebecca Spencer
- 1:30 – 3:30 pm Symposium 9 **Neural Dedifferentiation and Age-Related Cognitive Decline**, Joshua Koen, Chair, Michael Rugg, Co-Chair, *Back Bay C&D*
- ▶ 1:30 – 1:54 pm **Talk 1:** Age-Related Neural Dedifferentiation: Scope, Cause, and Consequences, Thad A. Polk
  - ▶ 1:54 – 2:18 pm **Talk 2:** Investigating Dedifferentiation in Visual Cortex Underlying False Memories in Aging, Caitlin Bowman
  - ▶ 2:18 – 2:42 pm **Talk 3:** The Relationship between Age, Neural Dedifferentiation, and Memory Encoding, Joshua D. Koen
  - ▶ 2:42 – 3:06 pm **Talk 4:** Impoverished Representations of Object Stimuli Revealed by Abnormal Eye Movement Behaviour, Morgan D. Barense
  - ▶ 3:06 – 3:30 pm **Talk 5:** Age-Related Neural Dedifferentiation – Some Points for Discussion, Michael D. Rugg
- 1:30 – 3:30 pm Symposium 10 **Hierarchical Cortical Rhythms and Temporal Predictions in Auditory and Speech Perception**, Anne Keitel, Chair, Johanna M. Rimmele, Co-Chair, *Constitution Ballroom*
- ▶ 1:30 – 1:54 pm **Talk 1:** Dissociating the Roles of Theta and Delta Neural Entrainment in Speech Processing, Anne Kösem
  - ▶ 1:54 – 2:18 pm **Talk 2:** Motor Origin of Temporal Predictions in Auditory Attention, Benjamin Morillon
  - ▶ 2:18 – 2:42 pm **Talk 3:** Lexical and Sub-Lexical Effects on Speech Segmentation, Johanna M. Rimmele
  - ▶ 2:42 – 3:06 pm **Talk 4:** Isolating Neural Indices of Continuous Speech Processing at the Phoneme-Level, Giovanni M. Di Liberto
  - ▶ 3:06 – 3:30 pm **Talk 5:** Linking Language and Oscillations through Rhythmic Computation, Andrea E. Martin

# Statement on Principles of Community and Code of Conduct

An open exchange of ideas, the freedom of thought and expression, and respectful scientific debate are central to the aims and goals of the Cognitive Neuroscience Society (CNS). CNS stands firmly for an environment that recognizes the inherent worth of every person and group, that fosters dignity, understanding, and mutual respect, and that celebrates diversity. The Governing Board and committee members of CNS endorse a safe, respectful and harassment-free experience for members, speakers/presenters and staff of the CNS.

Harassment and hostile behavior are unwelcome at CNS before, during and after organized lectures and poster sessions. We stand against harassment based on race, gender, religion, age, appearance, national origin, ancestry, disability, sexual orientation, and gender identity, or any other category. Harassment includes degrading verbal comments, deliberate intimidation, stalking, harassing photography or recording, inappropriate physical contact, and unwelcome sexual attention. The policy is not intended to inhibit challenging scientific debate, but rather to promote it by ensuring that all are welcome to participate in a shared spirit of scientific inquiry. These principles apply equally to scientific and social events organized by CNS.

**Any concerns should be conveyed to a member of our Diversity, Outreach and Training Committee:**

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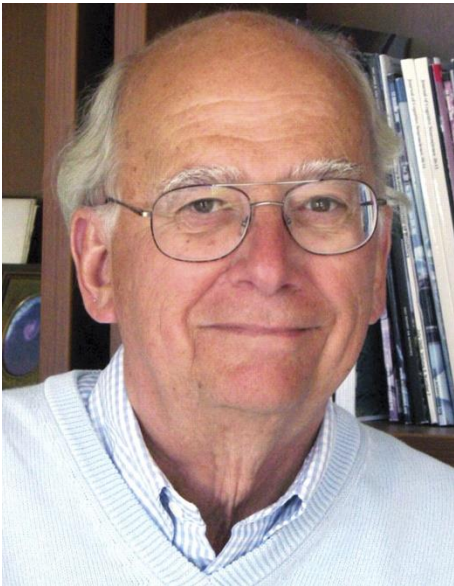
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# Keynote



## **Michael Gazzaniga,**

University of California, Santa Barbara

### **Keynote Address, OPEN TO THE PUBLIC**

Saturday, March 24, 2018, 5:30 – 6:30 pm, Grand Ballroom

### **The Consciousness Instinct**

How do neurons turn into minds? How does physical “stuff”—atoms, molecules, chemicals, and cells—create the vivid and various alive worlds inside our heads? This problem has gnawed at us for millennia. In the last century there have been massive breakthroughs that have rewritten the science of the brain, and yet the puzzles faced by the ancient Greeks are still present. In this lecture I review the the history of human thinking about the mind/brain problem, giving a big-picture view of what science has revealed. Understanding how consciousness could emanate from a confederation of independent brain modules working together will help define the future of brain science and artificial intelligence, and close the gap between brain and mind.

# George A Miller Prize

## Congratulations to Elizabeth Spelke for being awarded this honor!

Elizabeth Spelke will accept this prestigious award and deliver her lecture on Sunday, March 25, 2018, 5:00-6:00 pm, in the Grand Ballroom.

## Objects, Agents, and Persons: From Core Cognition to New Systems of Knowledge

### Elizabeth Spelke

Harvard University



Young children rapidly develop a basic, commonsense understanding of how the world works. Research on infants suggests that this understanding rests in part on ancient systems, shared by other animals, for representing bodies and their motions, agents and their intended actions, social beings and their experienced states of engagement, places and their distances and directions,

geometric forms, and approximate number. These core cognitive systems are innate, abstract, sharply limited, and opaque to intuition: in young infants, they operate automatically and largely independently of one another. Infants' knowledge grows, however, not only through learning capacities that enrich these systems and are common to all animals, but through a fast and flexible learning process that generates new systems of concepts and likely is unique to our species. The latter process composes new, explicit concepts by combining productively the concepts from distinct core knowledge systems. The compositional process is poorly understood but amenable to study, through coordinated interdisciplinary research. To illustrate, this talk will focus on infants' knowledge of objects, agents, and social beings, and on two new systems of concepts that emerge quite suddenly at the end of the first year: concepts of objects as kinds whose forms afford specific functions for action, and concepts of people as social agents whose mental states are shareable experiences of the things they act upon.

## 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

2017	Dr. David Van Essen, 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	Giacomo 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 School

# The Fred Kavli Distinguished Career Contributions Award

## Congratulations to Alfonso Caramazza, for being awarded this honor!

Alfonso Caramazza will accept this prestigious award and deliver his lecture on Monday, March 26, 2018 from 4:30 – 5:30 pm, in the Grand Ballroom.

### The Representation of Objects in the Brain: Nature or Nurture

**Alfonso Caramazza**

Harvard University



Different regions of human high-level visual cortex show highly reliable preference for different object domains, and they form part of distinct neural networks. What characterizes these object domains? And, how does this specialization emerge? The balance between nature and nurture has been a long-standing question in neuroscience and cognitive science. One view holds that the observed organization rests on an evolutionarily determined skeletal structure. A strong

alternative holds that the putatively domain-specific organization emerges through experience operating over domain-general, low-level, perceptual principles. The role of experience in distinguishing between these two

theoretical frameworks is fundamental. I will discuss some of the neuropsychological and neuroimaging evidence, the latter focusing on individuals deprived of sensory or motor experience, which I believe favors the view that the skeletal structure of object domain specialization is genetically determined.

## About the Distinguished Career Contributions Award

The Distinguished Career Contributions Award (DCC) was established in 2012 and it has been sponsored by the Fred Kavli Foundation since 2016. 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:

- |      |                                                            |
|------|------------------------------------------------------------|
| 2017 | Marcia K. Johnson, Yale University                         |
| 2016 | James Haxby, University of Trento, Dartmouth College       |
| 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            |



# Young Investigator Award

## Congratulations to the 2018 Young Investigator Award Winners.

**Morgan Barense, University of Toronto**

**Mike Yassa, University of California, Irvine**

YIA special lectures take place on Monday, March 26, 2018, 1:30 –2:30 pm, in the Constitution Ballroom of the Sheraton Boston Hotel in Boston, MA

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.

### The interface of memory and perception

Monday, March 26, 2018, 1:30 –2:00 pm, Constitution Ballroom

**Morgan Barense**  
University of Toronto



How does the act of perceiving an object influence how one will subsequently remember it? A central assumption in most modern theories of memory is that memory and perception are functionally and anatomically segregated. For example, amnesia resulting from medial temporal lobe (MTL) lesions is traditionally considered to be a selective deficit in long-term declarative memory with no effect on

perceptual processes. This view is consistent with a popular paradigm in cognitive neuroscience, in which the brain is understood in terms of a modular organization of cognitive function. The work I will present offers a new perspective. Guided by computational modelling complemented with neuropsychology and neuroimaging, I will provide support for the notion that memory and perception are inextricably intertwined, relying on shared neural representations and computational mechanisms. I will then describe how this new framework can improve basic understanding of cognitive impairments observed in Alzheimer's disease, as well as guide development of new diagnostic procedures for those at risk for dementia.

### Deconstructing Episodic Memory: An Information Processing Approach

Monday, March 26, 2018, 2:00 –2:30 pm, Constitution Ballroom

**Mike Yassa**  
University of California, Irvine



Memory is the bridge to our past and future. Without memory, we would be stuck in a constant present, unable to learn from our experiences and unable to plan for the future. Memory loss can have catastrophic impact on life and livelihood. Diseases that rob individuals of their memory capacity, such as Alzheimer's disease, place a tremendous burden on individuals, families, and global public health. This

talk will discuss our approach to understanding the neural mechanisms underlying episodic memory (memory for 'what', 'where' and 'when'), and how this approach is informed by animal and computational models. I will highlight recent advances in determining the functional division of labor in the medial temporal lobes using a combination of targeted behavioral paradigms and high-resolution functional MRI. This fundamental understanding is then applied to examining memory in older adults and assessing susceptibility to Alzheimer's disease, providing potential avenues for clinical intervention.

# Special Events

Title	Date	Time	Location
CNS 25 <sup>th</sup> Anniversary Gala	Sunday, March 25	6:30 – 11:30 pm	Constitution Ballroom
Latest Need to Know Re: NIH Funding Plus Training, Career and Research Grant Opportunities	Monday, March 26	12:15 – 1:15 pm	Back Bay A&B
CNS Trainee Professional Development Panel	Monday, March 26	5:45 - 7:15 pm	Constitution Ballroom
CNS Student Trainee Social Night	Monday, March 26	7:30 - 10:30 pm	Dillon's

## CNS 25th Anniversary Gala

March 25, 2018, 6:30-11:30 pm, Constitution Ballroom

Join us for a fun filled evening of dining and dancing as we celebrate the 25th anniversary meeting of the Cognitive Neuroscience Society.

\*Gala Ticket Required to enter.

**6:30 pm – Cocktails & Hors d'oeuvre**

**7:00 pm – Dinner & Dancing**

Cocktails and Hors d'oeuvre will be served in the Ballroom Foyer prior to dinner. Semi Formal Attire Requested, 21 and over.

Thank you to our sponsor  **THE KAVLI FOUNDATION**

## Latest Need to Know Re: NIH Funding Plus Training, Career and Research Grant Opportunities

Monday, March 26, 12:15 - 1:15 pm, Back Bay A&B

NIH Program Directors will present tips and news you need to find your best research fit and be successful in getting a training, career, or research grant at NIH; plus a brief overview of grant application, review, and funding processes. UPDATE! NEED TO KNOW: new application forms, human subjects research and clinical trials. Find us at this special session or look for NIH representatives throughout the meeting.

Speaker: Kathy Mann Koepke, NICHD/NIH

## CNS Trainee Professional Development Panel

Monday, March 26, 5:45 – 7:15 pm, Constitution Ballroom

**CNSTA Professional Development Panel Organizers:** Sarah Kark (Boston College), Holly Bowen (Boston College) and the CNSTA Committee Officers.

**Speakers:** Dr. Michael Yassa (CNS 2018 YIA recipient from UC Irvine), Dr. Ingrid Olson (Temple University), Dr. Joshua Greene, and others

Join the CNS Trainee Association (CNSTA) for the third annual Trainee 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 Student Trainee Social Night

Monday, March 26, 7:30 – 10:30 pm, Dillon's located at 955 Boylston St, Boston, MA 02115

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

**CNSTA Social Organizers:** Sarah Kark (Boston College), Holly Bowen (Boston College).

Come and join us for the annual CNS Trainee Association (CNSTA) Student Social Night, Monday, March 26th, after the CNS Trainee Professional Development Panel. We will meet in front of the exit to the Constitution Ballroom immediately following the panel (7:15 or 7:20pm) to go to the 7:30pm start of the Social. There will be no cover charge and one free drink and appetizers will be provided for the first 150 Trainees (cash bar).

More information will be posted on the CNS Trainee Association Facebook page (<https://www.facebook.com/CNSTrainees/>). We look forward to meeting you!

### HOW TO GET THERE:

From the Sheraton:

- Head west on Belvidere St toward Dalton St
- Turn Right onto Dalton St
- Turn Left onto Boylston St
- Destination will be on your right at 955 Boylston St, Boston, MA 02115

# Big Theory versus Big Data

## Big Theory versus Big Data: What Will Solve the Big Problems in Cognitive Neuroscience?

Saturday, March 24, 3:30 – 5:30 pm, Grand Ballroom

**Co-sponsored by the Cognitive Neuroscience Institute (CNI) and the Max-Planck-Society**

**Chair: David Poeppel, Max-Planck Institute & New York University**

**Speakers: Eve Marder, Gary Marcus, Alona Fyshe, Jack Gallant.**

All areas of the sciences are excited about the innovative new ways in which data can be acquired and analyzed. In the neurosciences, there exists a veritable orgy of data – but is that what we need? Will the colossal datasets we now enjoy solve the questions we seek to answer, or do we need more ‘big theory’ to provide the necessary intellectual infrastructure? Four leading researchers, with expertise in neurophysiology, neuroimaging, artificial intelligence, language, and computation will debate these big questions, arguing for what steps are most likely to pay off and yield substantive new explanatory insight.

### TALK 1: THE IMPORTANT OF THE SMALL FOR UNDERSTANDING THE BIG.

**Eve Marder, Brandeis University**

The brain employs highly degenerate systems that allow for resilience and robustness. These can be found in studies of large ensembles of neurons, and are likely to show up in all kinds of large-scale simulations and theoretical studies. Nonetheless, if one ever wishes to account for the behavior of large numbers of neurons, at some point it is necessary to go down to the cellular level for analysis to see which biological mechanisms are consistent with conclusions made and proposed at higher levels of analysis.

### TALK 2: WHICH PRESENTS THE BIGGEST OBSTACLE TO ADVANCES IN COGNITIVE NEUROSCIENCE TODAY: LACK OF THEORY OR LACK OF DATA?

**Jack Gallant, University of California, Berkeley**

Science is a collection of methods and processes for constructing elegant theories that can explain and predict high-dimensional data. It is obvious that both theory and data are required. But at any point in time, progress is likely to be limited relatively more by a lack of theory or a lack of data. It is my contention that at the current time, progress in human cognitive neuroscience — our ability to construct powerful explanatory, predictive models — is more limited by a lack of data than a lack of theory. This is because the human brain data that are available currently offer such a coarse view of brain function that they do not provide sufficient information to develop and test rich cognitive theories. Thus, most current cognitive theories do not predict well either human brain data or complex behavior under naturalistic conditions. Development of new devices, new methods of measurement and new experimental paradigms are required in order to

support cognitive models that respect the complexity of brain structure and function.

### TALK 3: DATA DRIVEN EVERYTHING

**Alona Fyshe, University in Victoria, British Columbia**

The structure of every organism, including humans, is the product of adaptation and evolution in the face of data. Clearly data is a powerful force, but in practice we will not have eons of data at our disposal. Does that necessarily mean we will need strong model priors? How far can we get with big-but-finite data?

### TALK 4: NEUROSCIENCE, DEEP LEARNING, AND THE URGENT NEED FOR AN ENRICHED SET OF COMPUTATIONAL PRIMITIVES

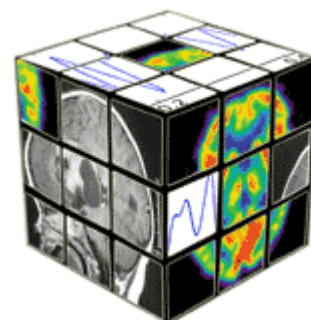
**Gary Marcus, NYU**

Large strands of AI and contemporary neuroscience are dominated by a quest to find a single computational primitive (or canonical cortical circuit) to rule them all, typically some version of hierarchical feature detection, first made popular by Hubel and Wiesel, and more recently by deep learning. At first glance, the superficial success of deep learning seems to be argument in favor of a homogenous computational system. I argue, however, that deep learning is far more superficial than widely believed, and that both deep learning and models of neuroscience must be supplemented by a broad range of elementary computational devices.

**Co-sponsored by the Cognitive Neuroscience Institute (CNI) and the Max-Planck-Society**



MAX-PLANCK-GESELLSCHAFT



# Data Blitz

Session #	Date	Time	Location	Chair
Data Blitz Session 1	Saturday, March 24	Noon – 1:30 pm	Back Bay A&B	Marian Berryhill
Data Blitz Session 2	Saturday, March 24	Noon – 1:30 pm	Back Bay C&D	Evangelia Chryssikou
Data Blitz Session 3	Saturday, March 24	Noon – 1:30 pm	Grand Ballroom	Lorna Quandt

## 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 24, 12:00 - 1:30 pm, Back Bay A&B

**Chair:** Marian Berryhill, University of Nevada, Reno (Chair)

**Speakers:** Samantha Cohen, Aaron Kucyi, Karen Campbell, Jonathan Greenberg, Megan Boudewyn, Amy Belfi, Tzipi Horowitz-Kraus, Joe Bathelt, Richard Betzel, Pieter Verbeke, Emily Kubicek, Guannan Shen, Daniela Palombo, Noah C. Yeagley, Ying Cai

### TALK 1: AGE AND SEX MODULATE THE VARIABILITY OF NEURAL RESPONSES TO ENGAGING VIDEOS

Samantha Cohen<sup>1,2</sup>, Agustin Petroni<sup>1</sup>, Nicolas Langer<sup>1,3</sup>, Simon Henin<sup>1</sup>, Tamara Vanderwal<sup>5</sup>, Michael P. Milham<sup>3,6</sup>, Lucas C. Parra<sup>1</sup>; <sup>1</sup>The City College of New York, <sup>2</sup>The Graduate Center of the City University of New York, <sup>3</sup>Child Mind Institute, <sup>4</sup>University of Zurich, <sup>5</sup>Yale Child Study Center, <sup>6</sup>Nathan Kline Institute for Psychiatric Research

### TALK 2: FREQUENCY-DEPENDENT TEMPORAL FLUCTUATIONS OF FUNCTIONAL CONNECTIVITY WITHIN INTRINSIC NETWORKS IN HUMAN CORTEX

Aaron Kucyi<sup>1</sup>, Josef Parvizi<sup>1</sup>; <sup>1</sup>Stanford University

### TALK 3: I DID IT MY WAY: EXPLAINING AGE-RELATED DECLINES IN INTER-SUBJECT SYNCHRONIZATION DURING NATURALISTIC VIEWING

Karen Campbell<sup>1</sup>, Cam-CAN<sup>2</sup>, Linda Geerligs<sup>3</sup>; <sup>1</sup>Brock University, <sup>2</sup>Cambridge Centre for Ageing and Neuroscience, University of Cambridge and MRC Cognition and Brain Sciences Unit, <sup>3</sup>Donders Institute for Brain, Cognition and Behaviour, Radboud University

### TALK 4: REDUCED INTERFERENCE IN WORKING MEMORY FOLLOWING MINDFULNESS TRAINING IS ASSOCIATED WITH INCREASES IN HIPPOCAMPAL VOLUME

Jonathan Greenberg<sup>1,2</sup>, Victoria L Romero<sup>3</sup>, Seth Elkin-Frankston<sup>3</sup>, Matthew A Bezdek<sup>4</sup>, Eric H Schumacher<sup>4</sup>, Sara W Lazar<sup>1,2</sup>; <sup>1</sup>Department of Psychiatry, Massachusetts General Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Charles River Analytics, <sup>4</sup>Georgia Institute of Technology

### TALK 5: TRACKING ATTENTION TO SPOKEN LANGUAGE USING EEG ALPHA OSCILLATIONS

Megan Boudewyn<sup>1</sup>, Cameron Carter<sup>1</sup>; <sup>1</sup>University of California, Davis

### Talk 6: The left anterior temporal lobe is a bidirectional convergence region mediating the relation between names and semantic knowledge for unique entities

Amy Belfi<sup>1</sup>, Brett Schneider<sup>2</sup>, Jonah Heskje<sup>3</sup>, Joel Bruss<sup>3</sup>, Daniel Tranel<sup>3</sup>; <sup>1</sup>Missouri University of Science & Technology, <sup>2</sup>University of Wisconsin-Madison, <sup>3</sup>University of Iowa

### TALK 7: ALTERATIONS IN NEURAL CIRCUITS SUPPORTING EXECUTIVE FUNCTIONS IN CHILDREN WITH READING DIFFICULTIES

Tzipi Horowitz-Kraus<sup>1,2</sup>, Rola Farah<sup>1</sup>; <sup>1</sup>Educational Neuroimaging Center, Faculty of Education in Science and Technology, Technion, Haifa, Israel, <sup>2</sup>Reading and Literacy Discovery Center, General Pediatrics, Cincinnati Children's Hospital Medical Center, Ohio, USA

### TALK 8: THE CINGULUM AS AN IMPORTANT MEASURE OF INDIVIDUAL DIFFERENCE IN BRAIN DEVELOPMENT

Joe Bathelt<sup>1</sup>, Mengya Zhang<sup>1</sup>, the CALM team<sup>1</sup>, Duncan Astle<sup>1</sup>; <sup>1</sup>MRC Cognition & Brain Sciences Unit, University of Cambridge

### TALK 9: THE SPECIFICITY AND ROBUSTNESS OF LONG-DISTANCE CONNECTIONS IN WEIGHTED INTER-AREAL STRUCTURAL BRAIN NETWORKS

Richard Betzel<sup>1</sup>, Danielle Bassett<sup>1</sup>; <sup>1</sup>University of Pennsylvania

### TALK 10: FAST SYNCHRONIZATION AND SLOW SYNAPTIC LEARNING AS A SOLUTION TO THE STABILITY-PLASTICITY DILEMMA

Pieter Verbeke<sup>1</sup>, Tom Verguts<sup>1</sup>; <sup>1</sup>Ghent University

### TALK 11: DEAF SIGNERS' SENSORIMOTOR SYSTEM ACTIVITY DURING PERCEPTION OF ONE AND TWO HANDED SIGNS

Emily Kubicek<sup>1</sup>, Lorna C. Quandt<sup>1</sup>; <sup>1</sup>Gallaudet University

**TALK 12: EXPLORING CATEGORICAL AND FUNCTIONAL BOUNDARIES OF TACTILE PERCEPTION USING SOMATOSENSORY MISMATCH RESPONSES**

Guannan Shen<sup>1</sup>, Peter J. Marshall<sup>1</sup>; <sup>1</sup>Department of Psychology, Temple University

**TALK 13: HIPPOCAMPAL CONTRIBUTIONS TO REWARD LEARNING**

Daniela Palombo<sup>1,2</sup>, Mieke Verfaellie<sup>1,2</sup>; <sup>1</sup>VA Boston Healthcare System Jamaica Plain, <sup>2</sup>Boston University School of Medicine, Department of Psychiatry

**TALK 14: EXPERTISE MATTERS IN EVALUATING STUDENTS' ORGANIZATION OF NEUROSCIENCE CONCEPTS**

Noah C. Yeagley<sup>1</sup>, Jennifer L. Stevenson<sup>1</sup>, Joel P. Bish<sup>1</sup>; <sup>1</sup>Ursinus College

**TALK 15: THE INFLUENCE OF STORAGE CAPACITY VERSUS CONTROL IN VISUAL WORKING MEMORY CAPACITY LIMITATIONS**

Ying Cai<sup>1,2</sup>, Andrew D. Sheldon<sup>3</sup>, Bradley R. Postle<sup>2,4</sup>; <sup>1</sup>National Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, <sup>2</sup>Department of Psychiatry, University of Wisconsin–Madison, <sup>3</sup>Medical Scientist Training Program and Neuroscience Training Program, University of Wisconsin–Madison, <sup>4</sup>Department of Psychology, University of Wisconsin–Madison

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## Data Blitz Session 2

Saturday, March 24, 12:00 - 1:30 pm, Back Bay C&D

**Chair:** Evangelia Chryssikou, University of Kansas

**Speakers:** Katarzyna Siuda-Krzywicka, Renee M. Visser, Patrick Ledwidge, Xiaoqing Hu, Rola Farah, Jie Zheng, Darya Zabelina, Örjan de Manzano, Louisa Kulke, Huang Zheng, Felipe Pegado, Gunes Sevinc, Pin-Hao Andy Chen, Amandine E. Grenier, Julie Sato

**TALK 1: COLOR CATEGORIZATION WITHOUT COLOR NAMING: NEUROPSYCHOLOGICAL EVIDENCE**

Katarzyna Siuda-Krzywicka<sup>1</sup>, Christoph Witzel<sup>2</sup>, Emma Chabani<sup>1</sup>, Myriam Taga<sup>3</sup>, Laurent Cohen<sup>1,4</sup>, Paolo Bartolomeo<sup>1</sup>; <sup>1</sup>Inserm U 1127, CNRS UMR 7225, Sorbonne Universités, UPMC Univ Paris 06 UMR S 1127, Institut du Cerveau et de la Moëlle épinière, ICM, Hôpital de la Pitié-Salpêtrière, Paris, France, <sup>2</sup>Justus-Liebig-Universität Gießen, <sup>3</sup>University of East London, <sup>4</sup>Hôpital de la Pitié Salpêtrière Paris, France

**TALK 2: PERSISTENCE OF HIPPOCAMPAL ACTIVATION PATTERNS IN POST-ENCODING REST PREDICTS SUBSEQUENT VOLUNTARY, BUT NOT INVOLUNTARY RECALL OF DISTRESSING FILM CLIPS**

Renee M. Visser<sup>1</sup>, Richard N. Henson<sup>1</sup>, Emily A. Holmes<sup>1,2</sup>; <sup>1</sup>Medical Research Council Cognition and Brain Sciences Unit, University of Cambridge, UK, <sup>2</sup>Karolinska Institutet, Stockholm, Sweden

**TALK 3: A LATE SLOW FRONTAL POSITIVITY ERP REFLECTS THE RESOLUTION OF CONTEXTUAL AMBIGUITY DURING NARRATIVE DISCOURSE COMPREHENSION**

Patrick Ledwidge<sup>1</sup>, Adam Ramsey<sup>1</sup>, Jeremy Foust<sup>1</sup>; <sup>1</sup>Baldwin Wallace University

**TALK 4: BIASING MEMORY REPLAY DURING SLEEP: A QUANTITATIVE SYNTHESIS OF TARGETED MEMORY REACTIVATION EFFECTS**

Xiaoqing Hu<sup>1</sup>, Larry Y. Cheng<sup>2</sup>, Ken A. Paller<sup>2</sup>; <sup>1</sup>The University of Hong Kong, <sup>2</sup>Northwestern University

**TALK 5: FUNCTIONAL AND STRUCTURAL CONNECTIVITY OF COGNITIVE CONTROL NETWORKS DURING NARRATIVE COMPREHENSION FROM BIRTH TO 9 YEARS**

Rola Farah<sup>1</sup>, Tzipi Horowitz-Kraus<sup>1,2</sup>; <sup>1</sup>Technion- Israel Institute of Technology, <sup>2</sup>Cincinnati Childrens Hospital Medical Center

**TALK 6: ORBITOFRONTAL CORTEX INTEGRATES AMYGDALA-HIPPOCAMPAL INFORMATION AND GUIDES SCHEMA-BASED EMOTIONAL CATEGORIZATION**

Jie Zheng<sup>1</sup>, Jack J. Lin<sup>1,2</sup>; <sup>1</sup>University of California, Irvine, <sup>2</sup>Comprehensive Epilepsy Program, Irvine, CA

**TALK 7: EVERYTHING YOU CAN IMAGINE IS REAL: COMPONENT PROCESSES AND BRAIN SYSTEMS OF IMAGINATION.**

Darya Zabelina<sup>1</sup>, Jessica Andrews-Hanna<sup>2</sup>; <sup>1</sup>University of Arkansas, <sup>2</sup>University of Arizona

**TALK 8: NEUROANATOMICAL DIFFERENCES BETWEEN MONOZYGOTIC TWINS DISCORDANT FOR MUSICAL PRACTICE**

Örjan de Manzano<sup>1</sup>, Fredrik Ullén<sup>1</sup>; <sup>1</sup>Karolinska Institutet

**TALK 9: COMBINING EYE-TRACKING AND EEG TO MEASURE ATTENTION TO SALIENT AND EMOTIONAL STIMULI**

Louisa Kulke<sup>1,2,3</sup>, Janette Atkinson<sup>3,4</sup>, Oliver Braddick<sup>4</sup>, Annkathrin Schacht<sup>1,2</sup>; <sup>1</sup>University of Göttingen, <sup>2</sup>Leibniz-ScienceCampus Primate Cognition, <sup>3</sup>University College London, <sup>4</sup>University of Oxford



**TALK 10: REDUCED PERSISTENCE OF SPONTANEOUS BRAIN ACTIVITY IN SCHIZOPHRENIA**

Huang Zheng<sup>1,2</sup>, Jianbo Gao<sup>1,2</sup>; <sup>1</sup>School of Computer, Electronics and Information, Guangxi University, China, <sup>2</sup>Institute of Complexity Science and Big Data Technology, Guangxi University, China

**TALK 11: HIERARCHICAL NEURAL REPRESENTATIONS BEHIND NATURALISTIC 'SOCIAL NORM' PERCEPTION IN AUTISM AND CONTROLS**

Felipe Pegado<sup>1</sup>, Hans Op de Beeck<sup>1</sup>; <sup>1</sup>KU Leuven

**TALK 12: MINDFULNESS-BASED STRESS REDUCTION IMPROVES FEAR EXTINCTION: AN FMRI INVESTIGATION**

Gunes Sevinc<sup>1,2</sup>, Britta Hölzel<sup>3</sup>, Muhammed Milad<sup>1</sup>, Sara W. Lazar<sup>1,2</sup>; <sup>1</sup>Massachusetts General Hospital, Division of Psychiatry, <sup>2</sup>Harvard Medical School, <sup>3</sup>Technical University of Munich, Klinikum rechts der Isar

**TALK 13: INTER-SUBJECT REPRESENTATIONAL SIMILARITY ANALYSIS REVEALS INDIVIDUAL VARIATIONS IN AFFECTIVE EXPERIENCE WHEN WATCHING EROTIC MOVIES**

Pin-Hao Andy Chen<sup>1</sup>, Eshin Jolly<sup>1</sup>, Todd F. Heatherton<sup>1</sup>, Luke J. Chang<sup>1</sup>; <sup>1</sup>Dartmouth College

**TALK 14: CHILDREN ENGAGE SEMANTIC PROCESSES TO VERIFY ARITHMETIC FACTS: EVIDENCE FROM THE N400**

Amandine E. Grenier<sup>1</sup>, Vanessa Cerda<sup>1</sup>, Danielle S. Dickson<sup>1</sup>, Bianca O. Obinyan<sup>1</sup>, Jacob P. Momen<sup>2,3</sup>, Nicole Y.Y. Wicha<sup>1</sup>; <sup>1</sup>The University of Texas at San Antonio, <sup>2</sup>University of California San Diego, <sup>3</sup>San Diego State University

**TALK 15: ALPHA OSCILLATORY SYNCHRONY UNDERLYING WORKING MEMORY MAINTENANCE IN CHILDREN**

Julie Sato<sup>1,2</sup>, Sarah Mossad<sup>1,2</sup>, Simeon Wong<sup>2</sup>, Benjamin Hunt<sup>2</sup>, Benjamin Dunkley<sup>1,2</sup>, Mary Lou Smith<sup>1,2</sup>, Margot Taylor<sup>1,2</sup>; <sup>1</sup>The Hospital for Sick Children, <sup>2</sup>University of Toronto

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## Data Blitz Session 3

Saturday, March 24, 12:00 - 1:30 pm, Grand Ballroom

**Chair:** Lorna Quandt, Gallaudet University

**Speakers:** Colleen Schneider, Esti Blanco-Elorrieta, Alexander Belden, Kevin P. Madore, Ekaterina Denkova, James A. Brissenden, Kelly A. Vaughn, Giulia V. Elli, Sara Cadavid, Jennifer Zuk, Nora Preuss, Rebecca Cutler, Heather Bruett, Trevor Brothers, Benjamin N. Conrad

**TALK 1: NEUROPLASTIC AND NEUROVASCULAR CONTRIBUTIONS TO VISUAL RECOVERY IN POST-STROKE CORTICAL BLINDNESS**

Colleen Schneider<sup>1,2</sup>, Emily Prentiss<sup>2</sup>, Zoe Williams<sup>1</sup>, Bogachan Sahin<sup>1</sup>, Bradford Mahon<sup>1,2</sup>; <sup>1</sup>University of Rochester School of Medicine and Dentistry, <sup>2</sup>University of Rochester School of Arts Sciences and Engineering

**TALK 2: TASK SWITCHING DECOMPOSED: MEG EVIDENCE FROM BIMODAL LANGUAGE SWITCHING**

Esti Blanco-Elorrieta<sup>1,2</sup>, Karen Emmorey<sup>3</sup>, Liina Pylkkänen<sup>1,2</sup>; <sup>1</sup>New York University, <sup>2</sup>NYUAD Institute, <sup>3</sup>San Diego State University

**TALK 3: HEARING CREATIVELY: DEFAULT NETWORK SELECTIVELY SYNCHRONIZES TO AUDITORY CORTEX IN JAZZ IMPROVISING MUSICIANS**

Alexander Belden<sup>1</sup>, Tima Zeng<sup>1</sup>, Emily Przysinda<sup>1</sup>, Psyche Loui<sup>1</sup>; <sup>1</sup>Wesleyan University

**TALK 4: NEURAL MECHANISMS OF EPISODIC RETRIEVAL SUPPORT DIVERGENT CREATIVE THINKING**

Kevin P. Madore<sup>1</sup>, Preston P. Thakral<sup>2</sup>, Roger E. Beaty<sup>2</sup>, Donna Rose Addis<sup>3</sup>, Daniel L. Schacter<sup>2</sup>; <sup>1</sup>Stanford University, <sup>2</sup>Harvard University, <sup>3</sup>University of Auckland

**TALK 5: IN SEARCH OF MIND WANDERING: DYNAMIC FUNCTIONAL CONNECTIVITY DURING REST AND TASK**

Ekaterina Denkova<sup>1</sup>, Jason S. Nomi<sup>1</sup>, Shruti Gopal Vij<sup>1</sup>, Lucina Q. Uddin<sup>1</sup>, Amishi P. Jha<sup>1</sup>; <sup>1</sup>University of Miami

**TALK 6: VISUAL FIELD REPRESENTATIONS IN HUMAN CEREBELLUM**

James A. Brissenden<sup>1</sup>, Sean M. Togyne<sup>1</sup>, David E. Osher<sup>2</sup>, Emily J. Levin<sup>3</sup>, Mark A. Halko<sup>4</sup>, David C. Somers<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>Ohio State University, <sup>3</sup>Brown University, <sup>4</sup>Harvard Medical School and Beth Israel Deaconess Medical Center

**TALK 7: MANAGING TWO LANGUAGES RELATES TO MANAGING TWO GOALS: FMRI EVIDENCE FROM TASK-SWITCHING**

Kelly A. Vaughn<sup>1</sup>, Arturo E. Hernandez<sup>1</sup>; <sup>1</sup>University of Houston

**TALK 8: THE NEURAL BASIS OF VERB AND NOUN SEMANTIC REPRESENTATIONS IN CONGENITALLY BLIND INDIVIDUALS**

Giulia V. Elli<sup>1</sup>, Rashi Pant<sup>1</sup>, Rebecca Achtman<sup>2</sup>, Marina Bedny<sup>1</sup>; <sup>1</sup>Johns Hopkins University, <sup>2</sup>DePauw University

**TALK 9: WHAT HAPPENS IN THE HUMAN BRAIN WHEN EXPLICIT WARNINGS REDUCE FALSE MEMORIES?**

Sara Cadavid<sup>1</sup>, M. Soledad Beato<sup>2</sup>, Mar Suarez<sup>2</sup>; <sup>1</sup>Universidad del Rosario, Colombia, <sup>2</sup>Universidad de Salamanca, Spain

**TALK 10: RELATIONSHIPS BETWEEN WHITE MATTER IN INFANCY AND SUBSEQUENT LANGUAGE ABILITIES IN PRESCHOOL**

Jennifer Zuk<sup>1,2</sup>, Michael Figuccio<sup>1</sup>, Xi Yu<sup>1</sup>, Joseph Sanfilippo<sup>1</sup>, Jade Dunstan<sup>1</sup>, Clarisa Carruthers<sup>1</sup>, Ellen Grant<sup>1,2</sup>, Nadine Gaab<sup>1,2,3</sup>; <sup>1</sup>Boston Children's Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Harvard Graduate School of Education

**TALK 11: FULL-BODY OWNERSHIP ILLUSION ELICITED BY VISUO-VESTIBULAR INTEGRATION**

Nora Preuss<sup>1</sup>, Henrik Ehrsson<sup>1</sup>; <sup>1</sup>Karolinska Institutet

**TALK 12: SEARCHING FOR SEMANTIC KNOWLEDGE: A VECTOR SPACE SEMANTIC ANALYSIS OF THE FEATURE GENERATION TASK**

Rebecca Cutler<sup>1</sup>, Nate Klooster<sup>2</sup>, Melissa Duff<sup>1</sup>, Sean Polyn<sup>1</sup>; <sup>1</sup>Vanderbilt University, <sup>2</sup>University of Pennsylvania

**TALK 13: THE ROLE OF INTER-REGION INFORMATION SYNCHRONY IN PROCESSING VISUAL STIMULI**

Heather Bruett<sup>1</sup>, Marc Coutanche<sup>1</sup>; <sup>1</sup>University of Pittsburgh

**TALK 14: TWO LATE POSITIVITIES DURING SENTENCE COMPREHENSION: THE INFLUENCE OF WRAP-UP AND COGNITIVE CONTROL**

Trevor Brothers<sup>1,2</sup>, Eddie Wlotko<sup>3</sup>, Simone Riley<sup>1</sup>, Margarita Zeitlin<sup>1</sup>, Connie Choi<sup>1</sup>, Gina Kuperberg<sup>1,2</sup>; <sup>1</sup>Tufts University, <sup>2</sup>Massachusetts General Hospital, <sup>3</sup>Moss Rehabilitation Research Institute

**TALK 15: NETWORK TOPOLOGY OF SYMBOLIC AND NONSYMBOLIC NUMBER PROCESSING: A 7T FMRI STUDY**

Benjamin N. Conrad<sup>1</sup>, Eric D. Wilkey<sup>1</sup>, Gavin R. Price<sup>1</sup>; <sup>1</sup>Peabody College, Vanderbilt University

## PHILOSOPHICAL TRANSACTIONS B

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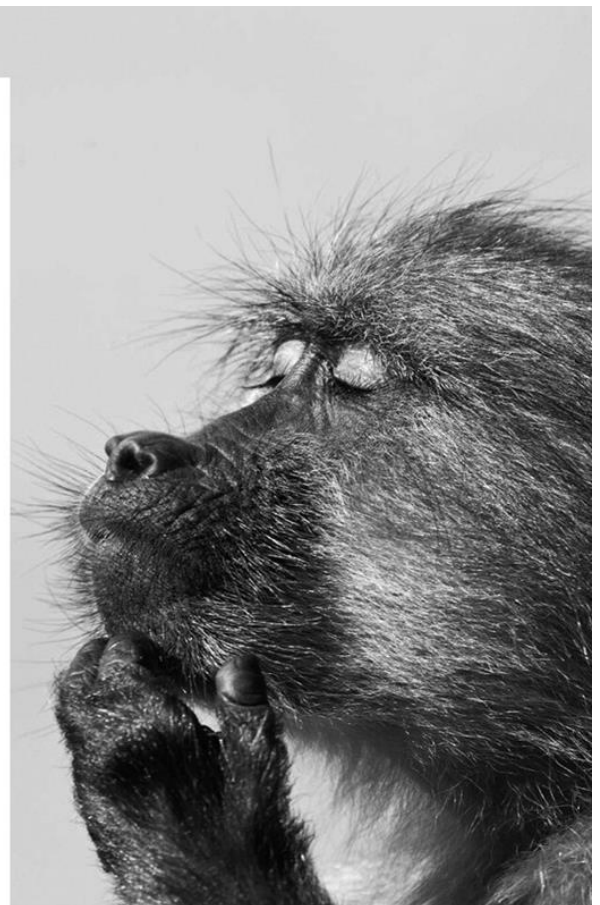
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*Image: A baboon gets lost in his thoughts, by Davide Giglio, awarded a special commendation in the Royal Society Publishing photography competition, 2015.*



# General Information

## Abstracts

Poster abstracts can be found in the printed program and in the PDF version which is downloadable from [www.cogneurosociety.org](http://www.cogneurosociety.org).

## ATM

An ATM is located in 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 second floor. 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. Please refer to the table below for the catering times.

### Saturday, March 24

Coffee Service, 2:45 – 3:15 pm, *Exhibit Hall C*

Welcome Reception, 6:30 – 7:30 pm, *Grand Ballroom Foyer*

### Sunday, March 25

Continental Breakfast, 8:00 – 8:30 am, *Exhibit Hall C*

Coffee Service, 2:30 – 3:00 pm, *Exhibit Hall C*

### Monday, March 26

Continental Breakfast, 8:00 – 8:30 am, *Exhibit Hall C*

Coffee Service, 3:30 – 4:00 pm, *Exhibit Hall C*

### Tuesday, March 27

Continental Breakfast, 8:00 – 8:30 am, *Exhibit Hall C*

## Certificate of Attendance

To receive a Certificate of Attendance please visit the Registration Counter on the Grand Ballroom Foyer of the Sheraton Boston Hotel at the end of 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.

## 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 hostile or offensive behavior towards another.

## 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.

Sunday March 25, 8am-10am, *Kent Room*

Monday March 26, 8am-10am, *Kent Room*

## Contact Us

To contact us onsite, visit the Registration Counter in the Grand Ballroom Foyer of the Sheraton Boston Hotel or send an email to [meeting@cnsmeeting.org](mailto:meeting@cnsmeeting.org) We will respond to your email at our soonest opportunity.

## 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 one drink ticket; it can be redeemed for alcoholic or non-alcoholic beverages at the Welcome Reception on Saturday. Lost drink tickets will not be replaced.

## Exhibit Hall

The conference exhibit is located in Exhibit Hall C of the Sheraton Boston 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 24	1:30 pm – 5:30 pm
Sunday, March 25	8:00 am – 5:00 pm
Monday, March 26	8:00 am – 5:45 pm
Tuesday, March 27	8:00 am – 12:00 pm

## Facebook

Find us on Facebook search for “*Cognitive Neuroscience Society*” and like us!

## Hotel

The Sheraton Boston Hotel is our exclusive Hotel for the CNS 2018 Annual Meeting and where all CNS 2018 meeting events will be held. Sheraton Boston Hotel located at 39 Dalton Street, Boston, MA, 02199.

## Hotel Restaurants

SideBar and Apropos. Whether you are in the mood for quick refreshment or a full meal, the culinary offerings at SideBar and Apropos will satiate you with an unforgettable interpretation of global dining.

## Internet Access

CNS attendees will receive complimentary wireless internet, ideal for web browsing, social networking, and checking emails only, within the meeting rooms and exhibit hall.

## Lost & Found

The meeting Lost and Found is located at the Registration Counter on the Grand Ballroom Foyer of the Sheraton Boston Hotel.

## Member Services

The member services desk is located at the Registration Counter on the Grand Ballroom Foyer of the Sheraton Boston Hotel. The member services desk will be open at the following times:

Saturday, March 24	11:00 am – 6:30 pm
Sunday, March 25	7:30 am – 5:30 pm
Monday, March 26	8:00 am – 5:30 pm
Tuesday, March 27	8:00 am – 3:00 pm

## Message Center

Messages for meeting registrants can be left and retrieved at the Registration Counter on the Grand Ballroom Foyer of the Sheraton Boston 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 Sheraton Boston Hotel 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 Grand Ballroom Foyer of the Sheraton Boston Hotel for a replacement.

## Parking

The Sheraton Boston Hotel offers secured and covered Valet parking. Parking rates are currently \$58/day and self parking at \$42/day with in and out privileges for guests and non-guests. (Please note this information was correct at time of print.)

## Phone Charging Station

There will be a small phone charging station located at the Registration Counter on the Grand Ballroom Foyer of the Boston Sheraton Hotel.

## Photo Disclaimer

Registration and attendance at, or participation in, the Cognitive Neuroscience Society meetings and other activities constitute an agreement by the registrant/attendee to CNS’s use and distribution (both now and in the future) of the registrant's or attendee's image in photographs of such events and activities.

## Poster Sessions

Poster sessions are scheduled on Saturday, March 24, Sunday, March 25, Monday, March 26, and Tuesday, March 27. 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 Exhibit Hall C of the Sheraton Boston Hotel. Badges are required at all times. Do not leave personal items in the poster room.

## Printed Program Booklet

One copy of the printed program booklet is available to each attendee. If you would like a second copy please check in at the Registration Counter in the Grand Ballroom Foyer of the Sheraton Boston 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.

## 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.

## Receptions

The Welcome Reception will be held in the Grand Ballroom Foyer, from 6:30-7:30 pm on Saturday, March 24, directly following the Keynote Address.

## Registration

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Tuesday, March 27	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

The T, will take you to multiple different locations throughout Massachusetts. Fare runs between \$1.70 - \$7.00. It is affordable and reliable.

Bus Service: Boston Express Bus, C&J Bus Lines, Concord Coach Lines, Dartmouth Coach, Peter Pan Bus, Plymouth & Brockton Bus CO.. Prices ranging from \$15-\$20.

Water taxi/ shuttle is a convenient and enjoyable way to get to and from Logan Airport. Fares run between \$3.50 - \$18.50 depending on which water transportation you choose. These include: MBTA Harbor Express, Boston Water Taxi- Boston Harbor Cruises, and Rowes Wharf Water Transport.

*\*Fares subject to change without notice.*

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## Website

<http://www.cogneurosociety.org>

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# Exhibits

## Exhibitors

Visit our exhibitors in Exhibit Hall C of the Boston Sheraton Hotel

**ANT-North America**  
**BIOPAC Systems, Inc.**  
**Brain Products GmbH**  
**Brain Vision. LLC**  
**Cambridge University Press**  
**Guger Technologies OG**  
**MIT Press**  
**Neuroelectrics Corp**  
**NIRx Medical Technologies, LLC**  
**NITRC**  
**Phillips EGI**  
**Psychology Software Tools**  
**Rogue Research, Inc.**  
**Routledge, Taylor & Francis**  
**Soterix Medical, Inc.**  
**SR Research Ltd**  
**Tobii Pro**

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Monday, March 26	8:00 am – 5:45 pm
Tuesday, March 27	8:00 pm – 12:00 pm

### GSA/PFA Awards

Congratulations to the 2018 winners of the Graduate Student Awards and the Post-Doctoral Fellow Awards. Each winner receives a monetary stipend to cover conference travel expenses.

#### Graduate Student Award Winners

Alyssa J. Kersey, University of Rochester  
Andrew Chang, McMaster University  
Aneesha Nilakantan, Northwestern University  
Matthew Moore, University of Illinois at Urbana-Champaign  
Alex Wiesman, University of Nebraska Medical Center  
Aditya Jayashankar, National Institute of Mental Health and Neuro Sciences (NIMHANS)  
Rachel Romeo, Harvard University, Division of Medical Sciences, Massachusetts Institute of Technology

#### Post-Doctoral Fellow Award Winners

Julia W. Y. Kam, University of California, Berkeley  
Eric C. Fields, Boston College, Brandeis University  
Avinash Vaidya, Brown University  
Alexandra N. Trelle, Stanford University  
Victoria Brunsdon, University of Kent  
Stacey Bedwell, Birmingham City University  
  
Beatriz Martin-Luengo, National Research University- Higher Schc Economics  
Elena Barbieri, Northwestern University  
Rafal Jonczyk, Adam Mickiewicz University  
David Rothlein, VA Boston Healthcare System

# Invited-Symposium Sessions

#	Title	Date	Time	Location
1	<b>From cage to clinic: Integrative neuroscience to understand and improve cognition and emotional function in healthy and clinical populations</b>	Sunday, March 25	10:00 am - Noon	Back Bay ABCD
2	<b>Human and Machine Cognition – The Deep Learning Challenge</b>	Sunday, March 25	10:00 am - Noon	Grand Ballroom
3	<b>Neural Mechanisms of Adaptive Forgetting</b>	Tuesday, March 27	10:00 am - Noon	Back Bay ABCD
4	<b>What makes musical rhythm special: cross-species, developmental, and social perspectives</b>	Tuesday, March 27	10:00 am - Noon	Constitution Ballroom

## Invited Symposium Session 1

### **FROM CAGE TO CLINIC: INTEGRATIVE NEUROSCIENCE TO UNDERSTAND AND IMPROVE COGNITION AND EMOTIONAL FUNCTION IN HEALTHY AND CLINICAL POPULATIONS**

Sunday, March 25, 10:00 am - 12:00 pm, Back Bay ABCD

**Chair: Cindy Lustig, University of Michigan**

**Speakers: Cindy Lustig, Tim Bussey, Damien Fair, Elizabeth Phelps**

Most of us conduct research on basic processes of cognition and emotion with the goal of helping to guide the development of interventions that can improve functioning in both healthy people and those with psychiatric or neurodegenerative disease - or at least that's what we say in our grant applications! In many cases, such interventions are first tested on animal models. Conversely, patient studies often serve as "natural experiments" that help elucidate basic cognition (e.g., HM, Phineas Gage). The talks in this session describe research that takes this integrative, translational approach to understand the neural circuitry underlying attention, memory, and emotion, including the critical role of this research in meeting the Research Domain Criteria mandate of understanding cognition across the continuum from normal to disordered function.

### **TALK 1: FROM TOP-DOWN TO "BOTTOMS-UP": CONVERGING APPROACHES TO UNDERSTAND THE NEURAL SYSTEMS INVOLVED IN ATTENTION AND COGNITIVE CONTROL**

**Cindy Lustig<sup>1</sup>; <sup>1</sup>University of Michigan**

Cognitive neuroscience uses a plethora of methods, in part because each provides only a limited window into neurocognitive interactions. I will describe how rodent, genetic, and human neuroimaging studies that use converging methods can help disentangle the complex neural systems that support bottom-up, stimulus-driven attention and top-down, goal-driven cognitive control. Neuroimaging studies in patients and genetic populations help illuminate which aspects of the circuitry

that activate in studies of healthy young adults may be essential for different aspects of attentional control – and which may merely be correlated. The rodent studies help to examine in more detail how that circuitry is modulated by cholinergic and dopaminergic systems. Finally, combining the results of PET imaging of declines in these different neuromodulator systems with behavioral studies in patients with Parkinson's disease and rodents with experimental damage to those systems helps us understand how they contribute to both cognitive deficits and the risk for falls.

### **TALK 2: BRIDGING THE TRANSLATIONAL GAP USING TOUCHSCREENS: ATTENTION AND MEMORY IN NEURODEGENERATIVE AND NEUROPSYCHIATRIC DISEASE**

**Tim Bussey<sup>1</sup>; <sup>1</sup>Western University, London, ON, Canada.**

Animal models are an indispensable tool for the study of normal cognition, and for understanding and discovering treatments for disorders of attention, memory, and other aspects of cognition. A major goal in the use of the animal models of cognition is translation: the ability successfully to transfer our behavioural results in animals to studies in humans (and, indeed, back again). However, the currently most widely used animal behavioural tests are very dissimilar to those used with human subjects, and criticism has been levied at animal research for using methodology that does not translate. The touchscreen method, in which mice and rats interact with an ipad-like touchscreen, provides the ability to test rodents on tasks in many cases identical, in all important respects, to the computerised tests increasingly used in humans. Furthermore some of the touchscreen tests developed in rodents are now being used successfully in human research. By taking such an approach we have a better chance of achieving successful translation from rodent to human in the study of normal cognition, and in discovering treatments for disorders of

cognition in, e.g., neuropsychiatric and neurodegenerative disease. In my talk I will illustrate this approach by describing experiments in neurodegenerative and neuropsychiatric disease in mice, rats and humans. I'll also describe our plans for [touchscreencognition.org](http://touchscreencognition.org), an outward-facing, open-access resource for touchscreen users (now about 200 labs) around the world, including facilitating the combination of touchscreens with e.g., optogenetics and miniscopes, searchable databases, and on-site training.

### **TALK 3: GRAPH THEORY AS A TRANSLATIONAL BRIDGE TO UNDERSTAND COGNITIVE AND EMOTIONAL DEVELOPMENT**

**Damien Fair<sup>1</sup>; <sup>1</sup>Oregon Health and Science University**

Research in psychiatry often relies on the assumption that the diagnostic categories identified in the DSM represent homogeneous syndromes. However, the mechanistic heterogeneity that potentially underlies the existing classification scheme might limit discovery of etiology. In our current work, we expand on previous brain imaging methods and use graph theory, specifically community detection, to clarify behavioral and functional heterogeneity in children with ADHD and Autism. We follow-up on these findings and highlight the potential for non-invasive functional imaging to serve as a translational bridge between human and animal models to better target the pathology from these discoveries. We argue that illumination of such phenomena will have significant practical importance for understanding typical development and to identifying the etiologic underpinnings of atypical developmental trajectories.

### **TALK 4: BUILDING ON ANIMAL MODELS TO UNDERSTAND MECHANISMS OF THREAT CONTROL IN HUMANS**

**Elizabeth Phelps<sup>1</sup>; <sup>1</sup>New York University**

Animal models of associative threat learning provide a basis for understanding human fears and anxiety. Building on research from animal models, we explore a range of means maladaptive defensive responses can be diminished in humans. Extinction and emotion regulation, techniques adapted in cognitive behavioral therapy, can be used to control learned defensive responses via inhibitory signals from the ventromedial prefrontal cortex to the amygdala. One drawback of these techniques is that these responses are only inhibited and can return, with one factor being stress. I will review research examining the lasting control of maladaptive defensive responses by targeting memory reconsolidation and present evidence suggesting that the behavioral interference of reconsolidation in humans diminishes involvement of the prefrontal cortex inhibitory circuitry, although there are limitations to its efficacy. I will also describe two novel behavioral techniques that might result in a more lasting fear reduction, the first by providing control over stressor and the second by substituting a novel, neutral cue for the aversive unconditioned stimulus.

### **TALK 5: Q&A PERIOD**

The speakers will take questions from the audience.

## **Invited Symposium Session 2**

### **HUMAN AND MACHINE COGNITION – THE DEEP LEARNING CHALLENGE**

Sunday, March 25, 10:00 am - 12:00 pm, Grand Ballroom

**Chair: Nikolaus Kriegeskorte, Zuckerman Institute and Department of Psychology, Columbia University**

**Speakers: Nikolaus Kriegeskorte, Katherine Storrs, Ilker Yildirim, Aude Oliva**

Deep neural networks are brain-inspired models of distributed computation across deep representational hierarchies. With roots in neuroscience and cognitive science, these systems are currently revolutionizing artificial intelligence (AI). What does this mean for Cognitive Neuroscience? In this Symposium we address this question from multiple perspectives. Neural networks provide a modeling framework that is neurobiologically plausible, but abstracts from biological details. In the last five years, engineering has demonstrated the computational power of such models in AI applications. We now have hardware and software that enables us to model cognition at scale. It is time to integrate neural network modeling with cognitive neuroscience. An emerging literature uses deep neural networks to model how the brain implements cognition. Each of the four talks in this Symposium will last 25 min and will be followed by 5 min of questions and answers.

### **TALK 1: INTRODUCTION TO DEEP LEARNING FOR COGNITIVE NEUROSCIENTISTS**

**Nikolaus Kriegeskorte<sup>1,2</sup>; <sup>1</sup>Columbia University, <sup>2</sup>Zuckerman Institute**

This talk will explain how deep neural networks work and how a given model can be tested with brain activity measurements and behavioral data. The modern developments in engineering will be briefly outlined in their historical context. Results of comparing representational geometries between deep convolutional neural networks for object recognition and the ventral visual pathway show that the models capture the representational stages from early visual retinotopic representations to high-level category-specific representations more accurately than any other class of computational model.

### **TALK 2: DEEP NET MODELS OF VISION: ARCHITECTURE AND DOMAIN-SPECIFIC TRAINING**

**Katherine Storrs<sup>1</sup>; <sup>1</sup>University of Giessen**

Although loosely inspired by the mammalian visual system, deep convolutional neural networks (DCNNs) are engineering solutions to the task of object recognition, and diverse architectures have proven successful at that task. In earlier studies, using relatively shallow architectures below cutting-edge classification accuracy, greater depth and higher task performance were associated with better prediction of object representations in inferior temporal (IT) cortex (Khaligh-Razavi



& Kriegeskorte, 2014; Yamins et al., 2014). Our results show that this is not the case for state-of-the-art deep architectures: the deepest, best-performing DCNNs, such as 50-100 layer deep residual networks, are not best at explaining human IT. We find that architecture interacts with training. Before training, randomly-weighted networks of diverse architectures explain a significant but similar proportion of variance in IT representations. After object-classification training, networks diverge in their ability to explain IT, and this ability is not predicted by either depth or final network classification accuracy. Training the same architecture on different tasks leads to networks with representations that best match different cortical subregions; a 16-layer net trained to identify faces best predicts representations in the fusiform face area, and one trained to classify scenes best predicts representations in the parahippocampal place area. There is great scope to better understand cortical computations by discovering the architectures and training regimes which most closely arrive at the representation of visual information in the brain.

### **TALK 3: ANALYSIS-BY-SYNTHESIS – EFFICIENT INVERSE GRAPHICS IN BIOLOGICAL FACE PROCESSING SYSTEMS**

**Ilker Yildirim<sup>1</sup>; <sup>1</sup>Massachusetts Institute of Technology**

The visual system must not only recognize and localize objects, but also perform much richer inferences about the underlying causes in the world that give rise to observed sense data. Analyzing scenes by inverting causal generative models, also known as “analysis-by-synthesis”, has a long history in computational vision, and these models have some behavioral support, but they are typically too slow to support online perception and have no known mapping to actual neural circuits. In this talk, I will present a neurally plausible model for efficiently inverting generative models of images and test it as a precise account of one aspect of high-level vision, the perception of faces. The model is based on a deep neural network that learns to invert a three-dimensional face graphics program in a single fast feedforward pass. It successfully explains both human behavioral data and multiple levels of neural processing in non-human primates, as well as a classic illusion, the “hollow face” effect. The model also fits qualitatively better than state-of-the-art computer vision models, and suggests an interpretable reverse-engineering account of how images are transformed into scene percepts in the primate ventral stream.

### **TALK 4: THE TRANSPARENCY OF DEEP LEARNING NETWORKS**

**Aude Oliva<sup>1</sup>; <sup>1</sup>Massachusetts Institute of Technology**

With the success of new computational architectures for visual processing, such as convolutional neural networks (CNN) and access to databases with millions of labeled examples (e.g., ImageNet, Places, Moments), the state of the art in computer vision is advancing rapidly. One important factor for continued progress is to understand the representations that are learned by the inner layers of these deep architectures. In this talk, I will illustrate how we can visualize meaningful units from deep networks and use them to provide explicit predictions of what an image represents.

### **TALK 5: Q&A PERIOD**

The speakers will take questions from the audience.

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## **Invited Symposium Session 3**

### **NEURAL MECHANISMS OF ADAPTIVE FORGETTING**

Tuesday, March 27, 10:00 am - 12:00 pm, Back Bay ABCD

**Chair: Michael Anderson, University of Cambridge**

**Speakers: Michael C. Anderson, Maria Wimber, Ronald L. Davis, Paul Frankland**

Neurobiological research on memory has focused on the mechanisms underlying memory storage, consolidation, and retrieval, with less attention to forgetting. Recently, however, it has become clear that forgetting involves distinct active processes, potentially serving adaptive functions. This symposium will highlight recent work spanning from cognition to molecular biology, demonstrating active mechanisms that promote memory loss. Michael Anderson will present recent work showing the existence of a species-general adaptive forgetting by which retrieval induces forgetting of competing traces that impede behaviour, establishing a causal role of the prefrontal cortex in triggering memory loss. Maria Wimber will present ground-breaking imaging work in humans showing how the retrieval process shapes what we remember. Specifically, using representational similarity analysis, she has tracked the gradual suppression of individual competing memories. Ron Davis will discuss an exciting program of research in *Drosophila*, including compelling evidence of “forgetting cells” that promote the erosion of behavioral memories and specifying the molecular processes that underlie active forgetting. Paul Frankland will present elegant work on the role of neurogenesis in degrading access to memories, and will discuss a broad computational perspective on why both trace persistence and transience are critical in optimising memory guided decision making. What unifies these talks, despite their remarkably diverse methodologies, species, and levels of analysis, is a converging view on the adaptive nature of forgetting in which the brain ensures that memory is tuned to an organism's needs. This view fundamentally diverges from the historical emphasis on forgetting as a failure of memory.

### **TALK 1: A SPECIES-GENERAL RETRIEVAL-SPECIFIC MECHANISM OF ADAPTIVE FORGETTING.**

**Michael C. Anderson<sup>1</sup>; <sup>1</sup>University of Cambridge**

Neurobiological research on memory has focused on the mechanisms underlying memory storage. Yet, the universal occurrence of forgetting throughout the animal kingdom suggests that it serves critical adaptive functions, driven by distinct mechanisms. Here we show the existence of a species-general active forgetting mechanism shared by rodents

and humans that suppresses distracting past events to facilitate the use of memory in service of adaptive behavior. We found that when rats retrieved their prior experience with an object to guide new exploration, it significantly reduced their later recognition of other objects previously encountered in that environment. As in humans, this retrieval-induced forgetting was competition-dependent, cue-independent, long-lasting, and reliant on inhibitory control processes mediated by the prefrontal cortex: Silencing medial prefrontal cortex with muscimol selectively abolished the forgetting effect. cFOS imaging revealed that prefrontal control demands declined over repeated retrievals as competing memories were forgotten, revealing a key adaptive benefit of forgetting. Occurring in 88% of the 63 rats studied, this finding establishes an unusually robust model of how active forgetting harmonizes the mnemonic ecosystem with behavioral demands, and permits isolation of its circuit, cellular and molecular mechanisms.

## **TALK 2: REMEMBERING CAUSES ADAPTIVE FORGETTING OF CORTICAL MEMORY TRACES**

**Maria Wimber<sup>1</sup>; <sup>1</sup>University of Birmingham, UK**

Remembering can, surprisingly, cause forgetting. Such forgetting arises when several overlapping memories compete for access to conscious remembering. Selecting one memory can then induce forgetting of competitors, a phenomenon known as retrieval-induced forgetting. In this talk I present recent work aimed at shedding light onto the neural mechanisms of competition and adaptive forgetting in the human brain. We use pattern analysis techniques to track memories in human brain activity as they are reactivated during remembering, and to track the adaptive changes in target and competing memories that result from repeated remembering. Our findings show that, while the neural patterns representing target memories become enhanced, competing memory patterns are gradually weakened over time. Our results strongly suggest that the human brain is capable of reducing mnemonic competition via an inhibitory mechanism that suppresses competing memories to make them less interfering in the future. More generally, we demonstrate how active remembering can adaptively change which aspects of our past remain accessible.

## **TALK 3: MOLECULAR NEUROBIOLOGY OF ACTIVE FORGETTING**

**Ronald L. Davis<sup>1</sup>; <sup>1</sup>Scripps Research Institute, Florida**

Experimental psychologists have studied active forgetting for decades, but the molecular and cellular mechanisms for forgetting were unknown until recently. I will summarize our studies across the last 6 years on active forgetting of olfactory memory in *Drosophila*. Our results indicate that a small number of dopamine neurons in the fly brain function as “forgetting cells,” promoting the erosion of behavioral memory and the cellular memory traces that form at learning in the neurons of the mushroom body circuit. The forgetting cells exhibit slow, chronic activity, although this activity is increased by sensory stimulation to the fly and decreased by sleep, providing a mechanistic explanation for retroactive interference and retroactive facilitation,

respectively. Cells in the mushroom body circuit receive this dopaminergic-forgetting signal through a specific dopamine receptor that mobilizes an intracellular biochemical signaling cascade terminating in the activation of the small molecules Rac1 and Cofilin, molecules known to re-model the actin cytoskeleton. We speculate that such re-modeling removes changes in actin cytoskeleton structure instilled at learning. An overriding conclusion from our studies is that the brain is designed with active mechanisms to forget memories along with mechanisms for acquisition and consolidation.

## **TALK 4: THE PERSISTENCE AND TRANSIENCE OF MEMORY**

**Paul Frankland<sup>1</sup>; <sup>1</sup>Hospital for Sick Children, Toronto**

The predominant focus in the neurobiological study of memory has been on remembering (persistence). However, recent studies have considered the neurobiology of forgetting (transience). In my talk I will draw parallels between neurobiological and computational mechanisms underlying transience. I will propose that it is the interaction between persistence and transience that allows for intelligent decision-making in dynamic, noisy environments. Specifically, I will argue that transience (1) enhances flexibility, by reducing the influence of outdated information on memory-guided decision making, and (2) prevents overfitting to specific past events, thereby promoting generalization. According to this view, the goal of memory is not the transmission of information through time, per se. Rather, the goal of memory is to optimize decision-making. As such, transience is as important as persistence in mnemonic systems.

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## **Invited Symposium Session 4**

### **WHAT MAKES MUSICAL RHYTHM SPECIAL: CROSS-SPECIES, DEVELOPMENTAL, AND SOCIAL PERSPECTIVES**

Tuesday, March 27, 10:00 am - 12:00 pm, Constitution Ballroom

**Chair: Jessica Grahn, University of Western Ontario**

**Speakers: Vani G. Rajendran, Fleur L. Bouwer, Molly J. Henry, Laura K. Cirelli**

The ability to synchronize to musical rhythm by picking up on a regular ‘beat’ occurs spontaneously, in every human culture. Perceiving the beat enhances basic timing processes, perceptual accuracy, and social interactions, yet its mechanisms are poorly understood. It is also unclear when this ability develops, both developmentally and evolutionarily. Burgeoning interest in rhythm and beat interventions in movement disorders (e.g., Parkinson’s disease) and language disorders (e.g., dyslexia) means understanding the neural bases of rhythm and beat perception is becoming more important. Here, we approach beat perception from different angles, from the relationship between low-level sound features and beat perception to wider social and developmental implications. First, Rajendran discusses how beat

perception arises from acoustic features, relating human behavioral data to spike rates in rodent auditory cortex. Subsequently, Bouwer examines a question of importance to many fields: do events that occur at 'expected' times (e.g., on the beat) show enhancement or suppression of associated neural and behavioural responses? Her EEG work manipulates different temporal expectations, dissociating expectations based on stimulus regularity and based on memory for stimulus timing. Henry adds a social perspective, assessing inter-subject synchronization of EEG signals in live versus videoed musical concerts, with and without other audience members being present. Audience members with greater inter-subject synchronization at the beat rate report greater enjoyment and social affiliation. Finally, Cirelli will consider the developmental relevance of beat perception, showing how infants' emotion and attention is altered by music with rhythmic qualities, with higher beat salience correlating with great attention.

### **TALK 1: NEURAL ADAPTATION MAY SET THE STAGE FOR THE PERCEPTION OF MUSICAL BEAT.**

**Vani G. Rajendran<sup>1</sup>, Jose A. Garcia-Lazaro<sup>2</sup>, Nicol S. Harper<sup>1</sup>, Nick A. Lesica<sup>2</sup>, Jan W. H. Schnupp<sup>3</sup>; <sup>1</sup>University of Oxford, <sup>2</sup>University College London, <sup>3</sup>City University of Hong Kong**

We know that beat perception in humans involves the coordinated engagement of sensory, motor and cognitive processes. However, these processes must somehow be set into motion by sound entering through the ears, so how does low-level auditory processing contribute to the activation of these networks? I will present cross-species work that relates beat tapping data from humans to firing rates recorded from the auditory system of rodent models to show that basic spike frequency adaptation may already be shaping where the beat is ultimately felt in rhythms and in real music. Specifically, on-beat sounds on average are accompanied by higher firing rates cortically and subcortically than off-beat sounds, and this difference may explain why some beat interpretations are vastly more likely to be perceived than others. These findings suggest that adaptation, by encoding the temporal context of sounds, creates points of neural emphasis that may influence the perceptual emergence of a beat.

### **TALK 2: PREDICTING "WHEN" IN RHYTHM: NEURAL MECHANISMS UNDERLYING BEAT-BASED AND MEMORY-BASED EXPECTATIONS**

**Fleur L. Bouwer<sup>1</sup>, Henkjan Honing<sup>1</sup>, Heleen A. Slagter<sup>1</sup>; <sup>1</sup>University of Amsterdam**

In the auditory environment, being able to predict the timing of sounds allows us to focus resources and optimizes the efficiency of the perceptual system. Moreover, it allows us to synchronize our movements to sound, for example, to dance to music. Beat-based timing (relying on some periodicity, like the beat in music) has been suggested to be distinct from interval- or memory-based timing (relying on learning of absolute intervals). However, the differentiation between these two mechanisms is currently debated. Here, to disentangle beat-based from memory-based temporal expectations, we created

rhythms in which we orthogonally manipulated the periodicity (beat-based expectations) and predictability (memory-based expectations) of the sequences. We compared early auditory responses (ERPs; P1 and N1), and behavioral responses to events in different positions in the rhythms: in phase with the periodicity (on the beat) or out of phase with the periodicity (off the beat). We found that in general, expectations facilitated responses and this was reflected neurally as an attenuation of auditory ERP responses. For memory-based expectations, we found facilitated responses and attenuation of both the P1 and N1 responses, regardless of the position of events in the rhythms. Contrarily, for beat-based expectations, we found large differences between the effects on the beat and off the beat. Whereas on the beat, behavioral responses were facilitated and the N1 response was attenuated, off the beat, behavioral responses were hampered and N1 responses enhanced, suggesting suppression for events out of phase with the periodicity. This effect was less pronounced for predictable sequences, suggesting that memory-based and beat-based expectations do interact. Finally, while the effects of memory-based expectations seemed to depend on the task-relevance of the rhythms (i.e., attention), the effects of beat-based expectations were independent from attention. Our results thus show that memory-based and beat-based temporal expectations can be differentiated both at the behavioral and the neural level, suggesting distinct mechanisms for these two forms of temporal expectations.

### **TALK 3: LIVE MUSIC INCREASES INTERSUBJECT SYNCHRONIZATION OF AUDIENCE MEMBERS' BRAIN RHYTHMS**

**Molly J. Henry<sup>1</sup>, Daniel J. Cameron<sup>2</sup>, Dana Swarbrick<sup>3</sup>, Dan Bosnyak<sup>3</sup>, Laurel Trainor<sup>3</sup>, Jessica Grahn<sup>1</sup>; <sup>1</sup>University of Western Ontario, <sup>2</sup>Georgetown University, <sup>3</sup>McMaster University**

Attending concerts is enjoyable for a number of reasons: watching performers make live music affords a qualitatively different experience than listening to a recording. Moreover, an important contributor to the enjoyment of a concert—at least anecdotally—is forming a bond with others who are enjoying the same musical experience. The current study considered the possibility that a live musical experience, i.e., the presence of live performers as well as an audience, might change the way brain rhythms synchronize across audience members, thereby changing audience members' musical and affiliative experiences. We collected electroencephalography (EEG) data in three different social contexts. First, EEG was measured simultaneously from 20 audience members (in a larger crowd of approximately 80 people) while they observed a live musical performance. Second, EEG was measured simultaneously from 20 audience members (in a larger crowd of approximately 80 people) while they watched the recording of the first concert on a large movie screen and with audio identical to the live concert. Finally, EEG was measured from 20 participants in small groups of 2 participants seated apart (tested in 10 separate sessions) while they observed the recorded musical performance. Thus, we

manipulated the presence of the performers while keeping audience context fixed, and we manipulated the presence of other audience members while keeping the recorded performance fixed. We analyzed the data in terms of intersubject synchronization (ISS), which quantifies the degree to which brain rhythms are synchronized across groups of individuals. ISS was calculated for individual frequencies ranging between 0.1 Hz (“infra-slow” oscillations) to 60 Hz (gamma-band oscillations) for each social context condition. We observed differences in the delta (2–4.5 Hz) band, which corresponds roughly to the range of rates in which a musical beat would be felt, depending on the presence of the performers—that is, audience members’ brain waves were more synchronized with each other when the performers were present. Moreover, network connectivity measures based on delta-band brain rhythms predicted individuals’ experience of the concert—individuals with more connections to other audience members enjoyed the concert more and felt more connected to the performers. Thus, the presence of live performers at a concert leads to increased synchronization of audience members’ brain rhythms selectively at rates that are associated with feeling and moving along with a musical beat. This increased synchronization is related to increased enjoyment and affiliation.

#### **TALK 4: MUSICAL RHYTHMS IN INFANCY: SOCIAL AND EMOTIONAL EFFECTS**

**Laura K. Cirelli<sup>1</sup>, Zuzanna B. Jurewicz<sup>1</sup>, Sandra E. Trehub<sup>1</sup>;**  
**<sup>1</sup>University of Toronto Mississauga**

The rudiments of rhythm perception and production, which are critical for musical engagement, develop early in life. The newborn brain is sensitive to the predictive nature of musical rhythms. With exposure, this initial sensitivity develops into rhythm perception and production skills that facilitate infants’ engagement in musical interactions, with important social and emotional consequences. For example, infants selectively help strangers who sing familiar songs or move synchronously rather than asynchronously with them. Universally, mothers sing to infants, capturing their attention and fostering interpersonal coordination. The present study assessed the coordination of arousal and attention between mothers and infants during mothers’ playful and soothing renditions of a song. Mothers sang *Twinkle Twinkle* to infants ( $n = 20$ ,  $M = 9.9$  months), alternating between soothing and playful renditions. In contrast to the soothing renditions, which were slow, softly sung, temporally regular, and legato in articulation, the playful renditions were faster, louder, higher in beat salience, more expressive in timing, and more staccato in articulation. Attention and arousal levels of mother and infant (skin conductivity) were monitored continuously. During soothing versions, maternal and infant arousal decreased as the song unfolded, resulting in high positive correlations in mother-infant arousal. During playful versions, maternal arousal levels were higher, and infant attention was highly focused on mother. The greater timing variability and faster tempo of playful renditions (closer, perhaps, to infants’ spontaneous tempo) may underlie infants’ enhanced attention. Relations between specific

acoustic features of maternal performances and infants’ response patterns will be presented.

#### **TALK 5: Q&A PERIOD**

The speakers will take questions from the audience

# Symposium Sessions

#	Title	Date	Time	Location
1	Memory Modulation via Direct Brain Stimulation in Humans	Sunday, March 25	3:00 pm – 5:00 pm	Back Bay A&B
2	Understanding human visual cognition through multivariate and computational analysis of MEG and EEG data	Sunday, March 25	3:00 pm – 5:00 pm	Back Bay C&D
3	The Next 25 Years of Cognitive Neuroscience: Opportunities and Challenges	Sunday, March 25	3:00 pm - 5:00 pm	Grand Ballroom
4	Episodic Memory Formation: From Neural Circuits to Behavior	Monday, March 26	10:00 am - Noon	Grand Ballroom
5	Are we all chained to the rhythm? Periodicity in human perception and behavior	Monday, March 26	10:00 am – Noon	Back Bay A&B
6	Top-down attention to time: A neural oscillatory perspective	Monday, March 26	10:00 am – Noon	Back Bay C&D
7	Developmental Cognitive Neuroscience: Brain Construction from the Fetus through Old Age	Monday, March 26	10:00 am – Noon	Constitution Ballroom
8	Mechanisms of Sleep's Role in Memory and Emotion Processing	Tuesday, March 27	1:30 – 3:30 pm	Back Bay A&B
9	Neural dedifferentiation and age-related cognitive decline	Tuesday, March 27	1:30 – 3:30 pm	Back Bay C&D
10	Hierarchical cortical rhythms and temporal predictions in auditory and speech perception	Tuesday, March 27	1:30 – 3:30 pm	Constitution Ballroom

## Symposium Session 1

### MEMORY MODULATION VIA DIRECT BRAIN STIMULATION IN HUMANS

Sunday, March 25, 3:00 - 5:00 pm, Back Bay A&B

**Chair: Cory Inman, Emory University**

**Speakers: Josh Jacobs, Nitin Tandon, Nanthia Suthana, Youssef Ezzyat, Cory Inman**

Direct electrical stimulation of the human brain holds the potential to further reveal the neural mechanisms underlying essential memory functions and may offer new therapeutic capabilities in the fight against devastating neurological memory disorders. Recent reports show both memory impairment and enhancement when stimulating specific encoding regions or retrieval networks, demonstrating the difficulty and complexity of enhancing memory with direct brain stimulation. We've learned several important factors to enhancing memory through these recent studies, including the benefits of selecting more precise sub-regional stimulation targets that may act as modulators of the downstream hippocampal memory system and the utility of timing stimulation based on real-time encoding state classification. This symposium features emerging research that demonstrates when direct brain stimulation fails and succeeds to enhance memory.

Notably, both forms of evidence are useful in uncovering the causal mechanisms underlying declarative memory function. Josh Jacobs will discuss findings that entorhinal and hippocampal brain stimulation causes a disruption of temporal and allocentric spatial memory. Nitin Tandon will present findings that stimulation selectively impairs spatial retrieval while not affecting temporal retrieval. Nanthia Suthana will present work showing that the precise location of electrical stimulation delivered to the entorhinal area is critical in enhancing performance on a wide-range of hippocampal-dependent memory tasks. Youssef Ezzyat will present work showing how timing of stimulation using multivariate decoding can rescue periods of poor memory function. Cory Inman will present work demonstrating that brief electrical stimulation to the basolateral amygdala reliably enhances memory in humans without eliciting an emotional response

## **TALK 1: ELECTRICAL STIMULATION OF ENTORHINAL CORTEX AND HIPPOCAMPUS IMPAIRS TEMPORAL AND ALLOCENTRIC REPRESENTATIONS IN HUMAN EPISODIC MEMORY**

**Josh Jacobs<sup>1</sup>; <sup>1</sup>Columbia University**

Developing a method for reliably improving human memory encoding would be transformative for everyday life. We examined the hypothesis that electrical stimulation in the entorhinal cortex and hippocampus provided a viable route to improving the efficiency of human memory encoding. Epilepsy patients with surgically implanted electrodes volunteered to perform our customized spatial and verbal episodic memory tasks. During the memory encoding periods of these tasks, electrical stimulation was applied transiently in the entorhinal and hippocampal regions using clinical macroelectrodes. In contrast to our expectations, stimulation impaired memory performance. This impairment was present in both tasks, and for stimulation in both left and right hippocampus and entorhinal cortices. These results suggest that the hippocampus and entorhinal cortex have a direct causal role in memory encoding. Moreover, by examining the detailed nature of the memory disruptions on stimulation trials in both tasks, we characterized the specific memory processes that were supported by these structures. Hippocampal and entorhinal stimulation disrupted the temporal structure of recall responses in the episodic task and the encoding of spatial stimuli that were likely to have been learned with allocentric strategies in the spatial task. These results suggest that the human hippocampal and entorhinal areas are causally important for temporal and allocentric memory. In addition to describing how stimulation can be used for causal functional brain mapping, we also discuss potential ways to use improved stimulation protocols to bolster memory.

## **TALK 2: NETWORK-BASED BRAIN STIMULATION SELECTIVELY IMPAIRS SPATIAL RETRIEVAL**

**Nitin Tandon<sup>1</sup>, Kamin Kim<sup>1</sup>, Amber Schedlbauer<sup>2</sup>, Matthew Rollo<sup>1</sup>, Suganya Karunakaran<sup>1</sup>, Arne Ekstrom<sup>2</sup>; <sup>1</sup>University of Texas Health Science Center at Houston, <sup>2</sup>University of California Davis**

Direct brain stimulation via electrodes implanted for intracranial electroencephalography (iEEG) permits the modulation of endogenous electrical signals with significantly greater spatial and temporal specificity than non-invasive approaches. It also allows for the stimulation of deep brain structures important to memory, such as the hippocampus, that are difficult, if not impossible, to target non-invasively. Direct stimulation studies of these deep memory structures, though, have produced mixed results, with some reporting improvement, some impairment, and others, no consistent changes. We hypothesize that to modulate cognitive function using brain stimulation, it is essential to modulate connected nodes comprising a network, rather than just alter local activity. iEEG data collected while patients performed a spatiotemporal memory retrieval task were used to map frequency-specific, coherent oscillatory activity between different brain regions associated with successful memory retrieval. We used these to identify two target nodes that exhibited selectively

stronger coupling for spatial vs. temporal retrieval. In a subsequent session, electrical stimulation - theta-bursts with a fixed phase-lag ( $0^\circ$  or  $180^\circ$ ) – was applied between the two target regions while patients performed spatiotemporal retrieval. Stimulation selectively impaired spatial retrieval while not affecting temporal retrieval, and this selective impairment was associated with theta decoupling of the spatial retrieval network. These findings suggest that stimulating tightly connected nodes in a functional network at the appropriate phase-lag may effectively modulate the network function, and while in this case it impaired memory processes, it sets a foundation for further network-based perturbation studies.

## **TALK 3: ADVANCEMENTS IN INTRACRANIAL STIMULATION OF THE ENTORHINAL AREA FOR ENHANCEMENT OF EPISODIC MEMORY**

**Nanthia Suthana<sup>1</sup>; <sup>1</sup>University of California, Los Angeles**

Studies using direct stimulation of the medial temporal lobe (MTL) to modulate hippocampal-dependent memory have provided conflicting results with studies showing improvement, impairment, or no effect of stimulation on behavioral performance. The current study sought to determine whether the precise location of stimulation within the MTL could explain divergent findings. Micro- and macro-electrode intracranial stimulation was applied in the MTL of twenty-five neurosurgical patients implanted with depth electrodes for clinical evaluation. High-resolution magnetic resonance imaging and automated image segmentation methods were used to precisely localize stimulation sites. Results show that direct stimulation of the entorhinal area successfully improved hippocampal-dependent memory across a wide range of memory tasks (verbal recall, spatial navigation, face-name memory, and person/object recognition) with stimulation site (entorhinal white/gray) as the critical determinant of subsequent memory performance independent of antiepileptic medication (on/off), side (left/right) or type (macro/micro) of stimulation. Stimulation of entorhinal white matter and not nearby gray matter was effective in improving hippocampal-dependent memory, indicating that stimulation of the afferent input to the hippocampus may be therapeutically effective for the modulation of memory encoding in humans. Findings also suggest that focal low-current micro-stimulation of the entorhinal white matter is sufficient to improve hippocampal-dependent memory and provides a novel approach for interrogating medial temporal circuits that support human episodic memory.

## **TALK 4: CLOSED-LOOP STIMULATION OF TEMPORAL CORTEX RESCUES FUNCTIONAL NETWORKS AND IMPROVES MEMORY**

**Youssef Ezzyat<sup>1</sup>; <sup>1</sup>University of Pennsylvania**

Memory lapses are frustrating and often arise from ineffective encoding. Oscillatory brain activity during encoding predicts later memory, suggesting that it can be used to discriminate good and poor memory function, and raising questions about how to modulate neural activity to increase memory success. Past studies that applied direct electrical stimulation for memory modulation in humans showed mixed

results, with some reporting enhancement and many showing disruption. Here, we test the hypothesis that stimulation is most likely to improve performance if it is targeted to rescue periods of poor memory function. We first asked whether we could reliably decode memory states from intracranial EEG recordings from epileptic patients as these patients performed a free recall task. We found that multivariate classifiers trained on oscillatory activity during encoding reliably predicted memory performance across sessions, suggesting the models identified temporally stable patterns of memory-related activity. We then used these models in later sessions to decode the probability of memory success as items were encoded and triggered stimulation in closed-loop if the classifier indicated the word was likely to be forgotten. Stimulation applied to the lateral temporal lobe increased memory performance relative to a matched non-stimulated condition, and also compared to an independent control group. We found that lateral temporal cortex stimulation triggered to rescue periods of poor memory led to increased classifier output, consistent with enhanced neural evidence for successful encoding. The data identify conditions under which stimulation can be used to improve memory, and suggest applications to treating memory dysfunction.

#### **TALK 5: DIRECT ELECTRICAL STIMULATION OF THE AMYGDALA ENHANCES EVENT-SPECIFIC DECLARATIVE MEMORY IN HUMANS**

**Cory Inman<sup>1</sup>, Joseph Manns<sup>1</sup>, Kelly Bijanki<sup>1</sup>, David Bass<sup>1</sup>, Stephan Hamann<sup>1</sup>, Daniel Drane<sup>1</sup>, Rebecca Fasano<sup>1</sup>, Robert Gross<sup>1</sup>, Jon Willie<sup>1</sup>; <sup>1</sup>Emory University**

Emotional events are often better remembered than neutral events, a benefit that many studies have hypothesized to depend on the amygdala's interactions with memory systems. These studies have indicated that the amygdala can modulate memory consolidation processes in other brain regions such as the hippocampus and perirhinal cortex. Indeed, rodent studies have demonstrated that direct activation of the amygdala can enhance memory consolidation even during non-emotional events. However, the premise that the amygdala causally enhances declarative memory for specific events has not been directly tested in humans. Here we tested whether brief electrical stimulation to the amygdala could enhance declarative memory for specific images of neutral objects without eliciting a subjective emotional response. Epilepsy patients undergoing monitoring of seizures via intracranial depth electrodes viewed a series of neutral object images, many of which were paired with brief, low amplitude electrical stimulation to the amygdala. Amygdala stimulation elicited no subjective emotional response yet led to reliably improved memory compared to control images when patients were given immediate and next-day free recall and recognition memory tests. Neuronal oscillations in the amygdala, hippocampus, and perirhinal cortex during this next-day memory test indicated that a neural correlate of the memory enhancement was increased theta and gamma oscillatory interactions between these regions, consistent with the idea that the amygdala prioritizes consolidation by engaging other memory regions.

These results show that the amygdala can initiate endogenous memory prioritization processes in the absence of emotional input, addressing a fundamental question and opening a path to future therapies.

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## **Symposium Session 2**

### **UNDERSTANDING HUMAN VISUAL COGNITION THROUGH MULTIVARIATE AND COMPUTATIONAL ANALYSIS OF MEG AND EEG DATA**

Sunday, March 25, 3:00 - 5:00 pm, Back Bay C&D

**Chair: Radoslaw Martin Cichy, Free University Berlin**

**Speakers: Alex Clarke, Leyla Isik, Santani Teng, Jean-Rémi King, Dimitrios Pantazis**

At every blink of an eye, the human brain transforms within a few hundred milliseconds the patterns of photons hitting the retina into a meaningful percept of the world that enables ecologically adaptive behavior. Our investigation of the underlying rapid and complex neural dynamics is limited by the power of our methodology, motivating the development of advanced analysis methods. This symposium presents two major emerging analytical approaches for MEG and EEG data that are beginning to transform the field and provide novel insights. First, we will show how time-resolved multivariate analysis approaches are applied to harvest the rich information captured by MEG and EEG data. Specifically, we will show how pattern classification approaches (decoding) and representational similarity analysis are used to reveal the time course of visual information processing. Second, we will show how comparison of MEG and EEG data to computational models of visual cognition such as deep neural networks (DNNs) advance our understanding of the representational formats and transformations in visual processing. We will highlight the novel insights created this way for a diverse set of visual capacities such as object recognition, action recognition, decision making and plasticity. We will discuss how these novel developments open up new horizons in vision research, and critically assess their current limitations.

#### **TALK 1: OSCILLATORY DYNAMICS OF PERCEPTUAL TO CONCEPTUAL REPRESENTATIONS IN THE VENTRAL VISUAL PATHWAY**

**Alex Clarke<sup>1</sup>, Barry Devereux<sup>2</sup>, Lorraine K. Tyler<sup>1</sup>; <sup>1</sup>University of Cambridge, <sup>2</sup>Queen's University Belfast**

Object recognition requires dynamic transformations of information from low-level inputs through to complex semantic representations. This process relies on the ventral visual pathway (VVP), where increasingly anterior regions code for increasingly complex object information, with the perirhinal cortex supporting object-specific semantic representations. These complex transformations are also underpinned by both feedforward and recurrent dynamics within the

VVP, where object-specific semantics emerges after around 200 ms. However, two important limitations remain. First, the modelling of visual and semantic properties tends to focus on three aspects – low-level visual properties, superordinate category information (e.g. animals) and object-specific semantics (e.g. tiger). This paints a compartmentalised picture that fails to capture incremental transitions whereby vision activates meaning. Second, while there is increasing knowledge of the oscillatory mechanisms underpinning basic vision, models of how visual inputs activate meaning lack mechanistic detail. Here, we overcome these limitations by combining a computational model of vision with a model of semantics to obtain quantifiable estimates of the incremental representations from low-level visual inputs to complex semantic representations that can be tested against neural activity using Representational Similarity Analysis (RSA). MEG signals, collected while participants viewed single objects, were source-localised and RSA was used to test how object information is represented by dynamically changing patterns of neural oscillations. Our results show that object information from layers of a visual deep neural network (vDNN) are represented by alpha oscillations throughout the VVP, while semantic information from an attractor network (sAN) was represented in theta oscillations. This frequency division was especially prominent in the ATL. Next, to test how object information changed over space and time, Granger Causality was applied to band-limited RSA time-courses. This revealed feedforward connectivity from the occipital lobe to posterior and anterior temporal lobe regions supported the transfer of visual representations from the vDNN. Critically, feedforward connectivity from visual regions to the ATL was associated with a transition of information from visual to semantic, while feedback from the ATL to the posterior temporal lobe was also associated with changes from visual to semantic information coding. Our research highlights the important role of alpha and theta oscillations for vision and semantics in the VVP, and that while feedforward dynamics underpin increasingly complex visual representations, object semantics relies on feedforward and feedback within the VVP with the ATL playing a crucial role.

## **TALK 2: FAST, INVARIANT REPRESENTATIONS FOR HUMAN ACTION IN THE VISUAL SYSTEM**

**Leyla Isik<sup>1,2</sup>, Andrea Tacchetti<sup>1,3</sup>, Tomaso Poggio<sup>1</sup>; <sup>1</sup>MIT, <sup>2</sup>Boston Children's Hospital, Harvard Medical School, <sup>3</sup>Google Deepmind**

The ability to recognize the actions of others from visual input is essential to humans' daily lives. The neural computations underlying action recognition, however, are still poorly understood. We use magnetoencephalography (MEG) decoding and convolutional neural network (CNN) models to study action recognition from a novel dataset of well-controlled, naturalistic videos of five actions (run, walk, jump, eat drink) performed by five actors at five viewpoints. We show that actor- and view-invariant representations for action arise in the human brain as early as 200 ms after a video begins. We next test different variants of spatiotemporal CNNs on the same viewpoint-invariant action recognition task, and compare them to the MEG data

using representational similarity analysis. We show these models can accurately categorize actions, and that deliberate model modifications that improve performance on the invariant action recognition task lead to data representations that better match human neural recordings. Our results suggest that the brain quickly computes action representations, and that robustness to complex transformations are driving these neural representations.

## **TALK 3: COMPARING DYNAMICS OF PROCESSING STREAMS IN BLIND AND SIGHTED READERS**

**Santani Teng<sup>1,2</sup>, Radoslaw M. Cichy<sup>3</sup>, Dimitrios Pantazis<sup>1</sup>, Aude Oliva<sup>1</sup>; <sup>1</sup>MIT, <sup>2</sup>Smith-Kettlewell Eye Research Institute, <sup>3</sup>Free University Berlin**

In response to sensory loss, crossmodal plasticity reorganizes functional processing streams so that cortical sensory areas typically devoted to the deprived modality become responsive to the spared modality. For example, neuroimaging work on blind individuals has demonstrated responses in “visual” cortex to stimuli such as tactile braille characters. However, both the spatiotemporal dynamics and the representations underlying these visual cortex responses remain poorly understood. To address this, we presented individual visual and tactile (braille) alphabetic letters to sighted and early-blind participants, respectively, while recording brain activity with magnetoencephalography (MEG). Both groups of participants read letters passively and responded via button press to occasional vigilance targets. We used multivariate pattern analysis to compare brain responses to different letters within each group, across groups, and across different time points in the trial epoch. We found that the classification time course of letter processing in sighted participants was generally faster, briefer, and more consistent than in blind participants. High within-group correlation at ~200 ms (sighted) and ~600 ms (blind) suggests common processing within groups near those respective time points; interestingly, those regions were also significantly correlated across groups, suggesting a common element of processing between groups as well. The results suggest that while blind and sighted letter reading is largely driven by different underlying computations, an element of processing is common across the presented modalities.

## **TALK 4: IDENTIFYING THE NEURAL ARCHITECTURE OF PERCEPTUAL DECISION MAKING WITH NORMATIVE, SHALLOW AND DEEP NEURAL NETWORK APPROACHES**

**Jean-Rémi King<sup>1,2</sup>, Laura Gwilliams<sup>1</sup>; <sup>1</sup>NYU, <sup>2</sup>Frankfurt Institute for Advanced Studies**

Perceptual processes have historically been decomposed in the light of normative, neuromimetic and, more recently, performance-optimized models. In the present study, we compare how well each of these approaches accounts for the spatio-temporal organization of human brain responses elicited by ambiguous visual stimuli. Forty-six healthy human subjects performed perceptual decision tasks on briefly flashed characters constructed from ambiguous characters, designed



to orthogonalize 7 levels of representations ranging from low-sensory features (e.g. spatial location of the stimulus), conceptual (whether stimulus is a letter or a digit) and task features (i.e. required hand movement). Whole-brain responses were recorded with magneto-encephalography (MEG) and source localized with magnetic resonance images (MRI). Our results reveal that these 7 levels of representations are sequentially encoded by the cortical hierarchy, and actively maintained until subjects' response. This hierarchy appears poorly correlated to normative, drift-diffusion, and 5-layer convolutional neural networks (CNN) optimized to accurately categorize alpha-numeric characters, but matches the sequence of activations of several state-of-the-art CNNs trained for natural image labeling. Overall, these results strengthen the notion that deep neural networks trained for complex visual categorization can converge towards the computational solution implemented by the human visual system. Furthermore, they suggest that the human brain automatically uses the latent primitives of this generic solution to perform perceptual decisions, even when simpler, optimal, alternatives are available. We finally discuss how the systematic discrepancies between CNNs and brain responses may be critical to the improvement of artificial neural networks.

#### **TALK 5: UNIQUE ASPECTS OF HUMAN OBJECT PROCESSING REVEALED BY MEG AND EEG**

**Dimitrios Pantazis<sup>1</sup>, Radoslaw M. Cichy<sup>2</sup>; <sup>1</sup>MIT, <sup>2</sup>Free University Berlin**

A growing number of studies apply multivariate pattern analyses of MEG and EEG data to understand human object processing, but it is still an open question to what extent MEG and EEG capture common or unique aspects of visual representations. Here we evaluated how MEG and EEG compare in resolving experimental conditions in a human visual object experiment. We measured concurrent MEG/EEG data while participants (N=15) viewed images of 92 everyday objects and compared MEG/EEG multivariate results in both time and space. Comparison in time relied on evaluating classification time courses directly, and via representational similarity analysis (RSA). Comparison in space relied on fusion of MEG/EEG data with fMRI data based on RSA. This enabled direct localization of MEG/EEG signals with independent fMRI data, overcoming the inherent ambiguities of inverse solutions. We found that both MEG and EEG revealed the millisecond spatiotemporal dynamics of visual processing, with mostly equivalent categorical information (animate vs. inanimate; faces vs. bodies; and others). Beyond yielding convergent results, we found that MEG and EEG also captured partly unique aspects of visual representations. Those unique components emerged earlier in time for MEG than for EEG. Identifying the sources of those unique components with fMRI, we found the locus for both MEG and EEG in high-level visual cortex (inferior-temporal), and in addition for MEG in early visual cortex (V1). Together, our results offer a novel information-based comparison of MEG and EEG signals, and motivate the wider adoption of multivariate analysis methods in both MEG and EEG.

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## **Symposium Session 3**

### **THE NEXT 25 YEARS OF COGNITIVE NEUROSCIENCE: OPPORTUNITIES AND CHALLENGES**

Sunday, March 25, 3:00 - 5:00 pm, Grand Ballroom

**Chair: Brad Postle, University of Wisconsin–Madison**

**Speakers: Gyorgy Buzsaki, Dean Buonomano, Dora Dora**

**Hermes, Steve Chang, Nina Dronkers**

As we contemplate 25 years of remarkable advances in cognitive neuroscience, this symposium is intended to offer a (necessarily selective) cross sampling of ideas and approaches that will be important during our society's next quarter century. It is bookended by talks that, broadly speaking, address how we conceptualize, and carry out, our science. Gyorgy Buzsaki will kick it off by considering how we approach the problem of interpreting neural coding, and Nina Dronkers will conclude by addressing whether our discipline's oldest method – deficit lesion correlation – remains relevant today. And because (spoiler alert!) the answer is, of course, "yes," she'll also cover 21st century techniques that would most certainly have impressed Flourens and Ferrier. The theme of time, introduced in the first talk, will carry into Dean Buonomano's demonstration of how principles and methods from nonlinear dynamical systems theory can be applied to problems in cognitive neuroscience. Studies of field potentials and of hemodynamic signals have played central roles in cognitive neuroscience research to date, and seem likely to continue to do so for the foreseeable future. Dora Hermes will discuss important advances in our understanding of how both of these classes of neurophysiological measurement relate to the neuronal activity that is ultimately of primary interest to most of us. Note that, although the abstract has emphasized the methodological dimension, the presentations summarized up to this point will also cover a broad range of cognition, including temporal and spatial cognition, visual perception, and language. The penultimate presentation, from Steve Chang, will address principles that are shaping the study in another exciting, and rapidly expanding, research domain, social behavior.

#### **TALK 1: GROUNDING MODELS OF NEURAL FUNCTION IN FIRST PRINCIPLES.**

**Gyorgy Buzsaki<sup>1</sup>; <sup>1</sup>NYU Medical Center**

Nothing is more intuitive, yet more complex, than the concepts of space and time. In contrast to spacetime in physics, space and time in neuroscience remain separate coordinates to which we attach our observations. Investigators of navigation and memory relate neuronal activity to position, distance, time point, and duration and compare these parameters to units of measuring instruments. Although spatial-temporal sequences of brain activity often correlate with distance and duration measures, these correlations may not correspond to neuronal representations of space or time. Neither instruments nor brains sense

space or time. Neuronal activity can be described as a succession of events without resorting to the concepts of space or time. Instead of searching for brain representations of our preconceived ideas, we suggest investigating how brain mechanisms give rise to inferential, model-building explanations.

## **TALK 2: NEURAL DYNAMICS, RECURRENT NEURAL NETWORKS AND THE PROBLEM OF TIME**

**Dean Buonomano<sup>1</sup>; <sup>1</sup>UCLA**

Much of the information the brain processes and stores is temporal in nature—a spoken word or a handwritten signature is defined as much by how it unfolds in time as by its spatial structure at any moment. The brain seamlessly assimilates and process temporal information, an ability that is critical to most behaviors: from reward anticipation to sensorimotor processing. We have proposed that timing on the scale of milliseconds to seconds relies on the inherent dynamics of recurrent neural networks (RNNs). And more generally, that the neural dynamics of RNNs represent a fundamental *modus operandi* for neural computation. Under this view information is stored and generated by dynamic attractors—locally stable neural trajectories. Thus, in contrast to the conventional view that memories are stored in static fixed-point attractors, under this view, many computations emerge from the voyage through neural state space as opposed to the destination

## **TALK 3: FIELD POTENTIALS, FMRI, AND THE ORDER OF OPERATIONS: WHY THE TWO MEASURES ARE BLIND TO DIFFERENT PARTS OF THE NEURONAL RESPONSES**

**Dora Dora Hermes<sup>1</sup>; <sup>1</sup>Stanford**

The most widespread measures of human brain activity are the blood oxygen level dependent (BOLD) signal measured with fMRI and surface field potentials (EEG, MEG, ECoG). Prior studies report a variety of relationships between these signals. I will describe our efforts to develop an understanding of how to interpret these signals and the relationship between them. We developed a model of (a) neuronal population responses, and (b) transformations from neuronal responses into the fMRI BOLD signal and electrocorticographic (ECoG) field potential. Rather than seeking a transformation between the two measures directly, this approach interprets each measure with respect to the underlying neuronal population responses. This approach shows that BOLD and field potential measures provide complementary information about human brain activity and we infer that features of the field potential that are uncorrelated with BOLD arise largely from changes in synchrony, rather than level, of neuronal activity.

## **TALK 4: ESTABLISHING NEURAL PRINCIPLES OF DYNAMIC AND INTERACTIVE SOCIAL BEHAVIORS**

**Steve Chang<sup>1</sup>; <sup>1</sup>Yale**

How do we interact with others, and why? Social interactions are characterized by a dynamic and contingent series of behaviors

occurring between at least two individuals. Although various abstractions used to capture snapshots of social interactions have been traditionally employed, recent evidence is beginning to favor experimentations involving well controlled, real-life interactions to better mimic natural social behaviors. In this talk, I will discuss the progress made from two lines of neuroscience research toward this goal involving pairs of nonhuman primates, presented with specific empirical results from the studies of social decision-making and social gaze interaction. First, at the single-neuron level, the encoding of social variables across self and other will be examined in the anterior cingulate cortex, orbitofrontal cortex, basolateral amygdala, and striatum. At the inter-regional level, unique signatures associated with diverse types of social decisions will be examined through the lens of oscillatory dynamics between the gyrus of the anterior cingulate cortex and the basolateral amygdala. Second, after empirically demonstrating the benefits of studying dyadic social gaze interactions in real-time, I will present neuronal correlates of interactive gaze interactions in the gyrus of the anterior cingulate cortex and the basolateral amygdala, from the perspectives of both local encoding and inter-regional oscillatory dynamics related to social gaze events. Finally, I will summarize our understanding as to how the brain utilizes various coding schemas to represent social variables that may be useful in guiding social interactions.

## **TALK 5: IS LESION ANALYSIS STILL RELEVANT FOR CONTEMPORARY COGNITIVE NEUROSCIENCE?**

**Nina Dronkers; <sup>1</sup>UC Davis**

The field of cognitive neuroscience began with observations that behavioral deficits could occur after injury to the brain. One famous case, that of Paul Broca's patient, Leborgne, is a classic example. Broca attributed the speech deficits in his patient to the lesion in the inferior frontal lobe that he discovered in the brain at autopsy. Over the years, new neuroimaging tools have carried on the tradition of lesion analysis, but with techniques that have far surpassed those available to the early pioneers. This presentation will review some of these new methods, what they have revealed, and how they continue to enhance our field.

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## **Symposium Session 4**

### **EPISODIC MEMORY FORMATION: FROM NEURAL CIRCUITS TO BEHAVIOR**

Monday, March 26, 10:00 am - Noon, Grand Ballroom

**Chair: Gabriel Kreiman, Children's Hospital, Harvard Medical School**

**Co-Chair: Ueli Rutishauser, Cedars Sinai and Caltech**

**Speakers: Gabriel Kreiman, Ueli Rutishauser, Michael Hasselmo, Daniel Schacter, Lila Davachi**

Episodic memories constitute the basic fabric of who we are. Several different lines of evidence including studies of lesions, functional neuroimaging, and neurophysiology, point to the critical role of medial temporal lobe structures including the hippocampus in the formation of episodic memories. There has been notable progress recently in dissecting the function of hippocampal circuits in animal models and also in characterizing the fundamental computations involved in human memory formation. Yet, animal circuit studies and human cognitive studies have been largely parallel and there is little understanding about the interrelationship between the findings in one domain and the other. The goal of this symposium is to help build bridges between the study of neuronal mechanisms and the behavioral and computational models of memory formation. What is the relationship between the rodent hippocampus navigation studies and human episodic memory formation? Is there something fundamentally different in how the human hippocampus supports memories? How can the studies in animals models constrain and inform models of human memory and vice-versa? How can behavioral studies of human memory encoding and recall relate to and inspire the investigations in animal models? Rather than independent and isolated snapshots of the proverbial elephant from different perspectives, we strive to build a unified computational theoretical framework of episodic memory formation that can encompass the neurophysiological and behavioral levels of analyses in animals and humans.

#### **TALK 1: INTRODUCTION + IN MEMORIAM FOR JOHN LISMAN + EPISODIC MEMORY FORMATION IN REAL LIFE**

**Gabriel Kreiman<sup>1,2</sup>; <sup>1</sup>Children's Hospital Harvard Medical School, <sup>2</sup>Center for Brains Minds and Machines**

1.1 Short introduction to the symposium by Ueli Rutishauser and Gabriel Kreiman. 1.2 In Memoriam: John Lisman (he had accepted to be a speaker in the Symposium. He passed away in Oct 2017. We will render homage to his contributions to the field). 1.3 Gabriel Kreiman. Episodic Memory formation in real life. Our brains are continuously bombarded with both external sensory information and internal processing. Part of those external and internal signals end up being consolidated in the form of episodic memories as a result of complex cognitive processes that filter and interpret incoming inputs. Our understanding of encoding processes in memory formation are derived from laboratory conditions typically involving lists of words or pictures devoid of the fundamental emotional, narrative, and temporal aspects of episodic memory. I will describe a series of behavioral experiments accompanied by a computational model that captures the fundamental filtering steps for memory encoding under real life conditions. In one experiment we used movies as a coarse proxy to examine dynamic formation of memories with rich stimuli. In another experiment, we used real life ground truth information by recording video and eye tracking information during one hour in the life of our subjects and subsequently testing for information recall. The systematic quantitative metrics for memory formation show that subjects showed consistent and high memorability for short movie

events, even single frames, at temporal scales of minutes up to one year post-encoding and low memorability for real life events. Additionally, we developed a machine learning approach that can make accurate predictions about which events people will and will not remember. The computational predictions were almost as accurate as self-predictions or majority-based human predictions, even for single trials and individual subjects.

#### **TALK 2: PROBING THE CIRCUITRY OF HUMAN DECLARATIVE MEMORY AT THE SINGLE-NEURON LEVEL**

**Ueli Rutishauser<sup>1,2</sup>; <sup>1</sup>Department of Neurosurgery, Cedars-Sinai Medical Center, Los Angeles, CA, <sup>2</sup>Division of Biology and Biological Engineering, California Institute of Technology, Pasadena, CA**

Much of what we know about how neuronal circuits enable us to form new memories stems from studying the response of individual neurons in animal models. While powerful, this leaves us unable to approach many important questions for lack of similar data in humans. We utilize neurosurgical procedures to record at single-cell resolution in behaving humans. I will describe results on the relationship between neuronal activity, plasticity, and memory derived from single-neuron recordings in the human hippocampus and left posterior parietal cortex (PPC). I will describe a putative circuit memory-circuit composed of three functional cell types: visually-selective (VS), memory-selective (MS), and memory-choice cells. VS neurons are tuned to high-level concepts, are sensitive to attention, and their activity forms attractors through persistent activity over several seconds while stimuli are held in working memory. MS neurons signal whether a stimulus is novel or familiar in a graded manner indicative of memory strength as indicated by subjective confidence. The extent to which novelty-sensitive MS cells phase-lock to ongoing theta oscillations is indicative of the success or failure of memory formation. Lastly, memory-choice cells in PPC signal decisions made about declarative memories, including whether a stimulus is novel or familiar and the confidence in this judgment, a finding that provides the first single-cell evidence for the role of the PPC in episodic retrieval. Together, these results begin to provide a circuit-level understanding of human episodic memory and the mechanisms that allow us to translate such memories into decisions.

#### **TALK 3: NEURAL CODING OF SPACE AND TIME FOR EPISODIC MEMORY**

**Michael Hasselmo<sup>1</sup>; <sup>1</sup>Center for Systems Neuroscience, Boston University**

Episodic memory is defined as memory for events occurring at specific times and places. Neurophysiological recordings in behaving rodents demonstrate neuronal response properties that may contribute to the encoding of space and time for episodic memory. This includes the coding of space by grid cells in entorhinal cortex and place cells in hippocampus, and the coding of temporal intervals by time cells in both regions. Neurophysiological data also demonstrates coding of

additional spatial dimensions such as head direction and the location of environmental barriers. All these responses are relevant to encoding of events within an environment in episodic memory and the use of these representations for memory-guided behavior. Experimental data indicates potential mechanisms for the neural coding of time and space. Inactivation of input from the medial septum impairs the responses of neurons coding space and time. This impairment could arise from the loss of network oscillatory dynamics such as theta rhythm or from loss of modulatory inputs including acetylcholine release. Acetylcholine appears to regulate encoding and consolidation dynamics, consistent with effects of pharmacological manipulations on human episodic memory encoding. Computational modeling addresses the potential functional role in episodic memory of time cells, grid cells, place cells and head direction cells, as well as modulatory regulation of encoding and retrieval dynamics. These computational models demonstrate how neuronal representations of space and time could contribute to the encoding of episodic memory as events associated with spatiotemporal trajectories.

#### **TALK 4: IMAGINATION, CREATIVITY, AND EPISODIC RETRIEVAL**

**Daniel Schacter<sup>1</sup>; <sup>1</sup>Department of Psychology, Harvard University**

Numerous recent studies have explored the role of memory in imagining possible future experiences and related kinds of hypothetical events. According to the constructive episodic simulation hypothesis, simulation of future experiences depends importantly on episodic retrieval, which allows individuals to draw on the past in a manner that flexibly extracts and recombines elements of previous experiences. This talk will consider the contributions of episodic retrieval and simulation to a range of cognitive tasks that are not ordinarily considered “episodic memory tasks”, focusing in particular on future imagining and divergent creative thinking.

#### **TALK 5: WHAT IS AN ‘EPISODE’ IN EPISODIC MEMORY? MOVING BEYOND A SINGLE MOMENT TO UNDERSTANDING HOW TEMPORALLY EXTENDED EPISODIC MEMORIES ARE CONSTRUCTED FROM ONGOING EXPERIENCE**

**Lila Davachi<sup>1</sup>; <sup>1</sup>Department of Psychology, Columbia University**

The profound deficit in acquiring new episodic memories after hippocampal damage in humans was a turning point in the history of memory research. These findings focused memory scientists on the functions of the hippocampal system. As we learn more from both animal neuroscience and human cognitive neuroscience about quirks of this system, the questions have shifted slightly to ask not what the hippocampus does for memory, per se, but what more global functions or operations does this system support? Our recent work has suggested that hippocampal processes are important for two possibly synergistic operations: temporal integration and separation. It is through the action of these two processes, that distinct episodes can emerge from dynamic, ongoing experiences. Further, our recent work has extended these same mechanisms to explain very short-term

temporal duration estimates. I will present recent behavioral and imaging work demonstrating that shifts in event representations along with temporal stability in hippocampal multivariate patterns and distinct hippocampal-PFC connectivity contribute both to short duration temporal estimates as well as longer term temporal memory judgments.

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## **Symposium Session 5**

### **ARE WE ALL CHAINED TO THE RHYTHM? PERIODICITY IN HUMAN PERCEPTION AND BEHAVIOR**

Monday, March 26, 10:00 am - Noon, Back Bay A&B

**Chair: Benedikt Zoefel, MRC Cognition and Brain Sciences Unit, University of Cambridge, UK**

**Speakers: Huan Luo, Ian C. Fiebelkorn, Alessandro Benedetto, Benedikt Zoefel,**

Neural oscillations are commonly assumed to reflect rhythmic fluctuations in the excitability of neuronal ensembles and their importance for stimulus processing has been emphasized repeatedly. Nevertheless, an important support for a functional relevance of these brain rhythms would be the observation that we can find similar rhythms in perception and behavior. In this symposium, we will present evidence that perception and behavior might indeed be “chained” to a rhythm – potentially the one imposed by brain oscillations. In the first talk, Huan Luo will use sophisticated analyses of behavioral data to demonstrate that visual object recognition involves a rhythmic component, including complex coupling relationships between different frequencies. In the second talk, Ian C. Fiebelkorn will summarize behavioral data revealing periodicity in visual spatial attention and show that these attentional fluctuations are tightly linked with oscillatory activity in a frontoparietal network. Third, Alessandro Benedetto will show that visual perception fluctuates rhythmically before a voluntary action, indicating that sensorimotor interaction entails oscillatory mechanisms that can be discovered using behavioral paradigms. Finally, Benedikt Zoefel will present an attempt to transfer experimental approaches to the auditory system that have previously revealed perceptual rhythms in the visual modality – and argue that the use of brain rhythms to “gate” perception and behavior might differ fundamentally between the two modalities. Together, our symposium will reveal the importance of rhythm in perception and behavior, and its intimate link with neural oscillations in the brain that might represent a fundamental “tool” developed to optimize stimulus processing.

#### **TALK 1: TEMPORAL ORGANIZATION OF MULTIPLE OBJECTS IN BOTTOM-UP AND TOP-DOWN ATTENTION**

**Huan Luo<sup>1,2</sup>; <sup>1</sup>School of Psychological and Cognitive Sciences, Peking University, China, <sup>2</sup>McGovern Institute for Brain Research, Peking University, China**

In a cluttered visual scene consisting of multiple objects, it is important that our brain can efficiently and flexibly allocate and coordinate resources to overcome limited processing capacity. It has been well established that neuronal oscillations in brain signals play an important role in attention by modulating brain contexts at various temporal scales, indicating that attention is intrinsically dynamic and displays 'rhythmic' profiles. In a series of studies, we employed time-resolved behavioral measurements to access how attentional behavioral performances (e.g., reaction time, percent correct) change as a function of time. We found that typical attentional effects are revealed as a slow trend in behavioral time courses. Furthermore and most importantly, our behavioral data disclosed rhythmic fluctuations in several neurophysiologically relevant neuronal rhythms (i.e., behavioral oscillations) such as the theta (~3-5 Hz) and alpha band (~8-20 Hz), as well as coupling between the different rhythms. These results not only support the idea that the spectral profile typically observed for neuronal oscillations might be directly revealed at a behavioral level, but also the notion that attention is not stationary but dynamically samples multiple visual objects in a rhythmic or serial-like way. Our work advocates a generally central role of temporal organization in visual attention such that multiple objects are sequentially sorted in time based on their priority, determined by either top-down attentional demands or bottom-up saliency.

#### **TALK 2: A DYNAMIC INTERPLAY WITHIN THE FRONTOPARIETAL NETWORK UNDERLIES RHYTHMIC SPATIAL ATTENTION**

**Ian C. Fiebelkorn<sup>1</sup>, Mark A. Pinsk<sup>1</sup>, Sabine Kastner<sup>1</sup>; <sup>1</sup>Princeton Neuroscience Institute and Department of Psychology, Princeton University**

Visual-spatial attention boosts neural processing at behaviorally relevant locations, thereby improving behavioral performance. Whereas classic studies of spatial attention assumed that these neural and behavioral effects were continuous over time, several recent behavioral studies have instead revealed rhythmic fluctuations in attention-related effects. These rhythmic fluctuations lead to alternating periods of either heightened or diminished perceptual sensitivity, determining the moment-to-moment likelihood of detecting a behaviorally relevant stimulus. Yet the neural basis of these fundamental rhythms has remained largely unknown. Here, we used electrophysiological recordings in macaques to demonstrate that rhythmic sampling during spatial attention results from an ongoing, dynamic interplay between two hubs of the frontoparietal attention network: the frontal eye fields (FEF) and the lateral intraparietal area (LIP). Our results show that neural oscillatory activity organizes functional interactions between FEF and LIP through phase-amplitude coupling, with theta (3–8 Hz) phase providing the clocking mechanism that coordinates two alternating states. The first is an FEF-dominated state associated with increased beta activity (15–35 Hz) and relatively better behavioral performance. The second is an LIP-dominated state associated with increased gamma activity (>35 Hz)

and relatively worse behavioral performance. Our findings thus show that theta-band rhythms govern alternating attentional states in the frontoparietal network, leading to rhythmic sampling of the visual environment and rhythmic fluctuations in perceptual sensitivity. We propose that rhythmic sampling provides spatial attention with critical flexibility, allowing for windows of opportunity when attention can more easily shift from its present focus to another location.

#### **TALK 3: THE RHYTHMS OF SENSORIMOTOR INTEGRATION: ACTION PLANNING AND PERCEPTUAL OSCILLATIONS**

**Alessandro Benedetto<sup>1</sup>, Maria C. Morrone<sup>2,3</sup>; <sup>1</sup>Department of Translation Research on New Technologies in Medicine and Surgery, University of Pisa, Italy, <sup>2</sup>Institute of Neuroscience, National Research Council (CNR), Pisa, Italy, <sup>3</sup>Scientific Institute Stella Maris, Pisa, Italy**

Action and perception are tightly coupled systems requiring strong coordination over time. However, how the brain achieves this close synchronization is still a matter of debate. Recently, a growing body of scientific literature has shown that voluntary actions can synchronize the rhythms of vision, suggesting that brain oscillations might be instrumental for visuomotor integration. In a series of experiments, we asked participants to perform a contrast discrimination task before, during, or after executing a hand or saccadic eye movement. We found that, even a second before executing a voluntary action, visual contrast sensitivity oscillates in the delta/theta range, phase-locked with the forthcoming action. These results indicate the presence of an early signal for an intention to move that triggers perceptual fluctuations. Importantly, the oscillatory modulations embedded a motor-related (saccadic or motor-induced) suppression, in agreement with the involvement of a signal representing the intention to move. Moreover, voluntary actions triggered oscillations of visual sensitivity and other perceptual measures at different frequencies, suggesting the presence of several distinct mechanisms modulating perception. Finally, we show that the visually-evoked BOLD response in primary visual cortex (V1) measured with ultra-high (7T) magnetic resonance imaging fluctuates as a function of the timing of stimulus presentation after a button press, demonstrating that the rhythmic sensorimotor interaction operates on very early stages of visual processing.

#### **TALK 4: CAN WE FIND AUDITORY PERCEPTUAL CYCLES?**

**Benedikt Zoefel<sup>1,2</sup>; <sup>1</sup>MRC Cognition and Brain Sciences Unit, Cambridge, UK, <sup>2</sup>University of Cambridge, UK**

Recent research suggests that the brain cycles between optimal and less favourable moments for stimulus processing, creating periodic fluctuations in perception and behaviour, or "perceptual cycles". However, most of these findings are restricted to the visual domain whereas results are sparse and inconsistent for the auditory system. Here, we adapted previously successful experimental paradigms to reveal visual rhythms, and transferred them to the auditory domain: For instance, we created an auditory equivalent of the visual "wagon

wheel illusion”, previously used to demonstrate rhythm in visual perception; we tested whether processing of auditory information “reverberates” in the brain, just as for the visual system; and we tested whether the auditory system would be affected by a sub-sampling of its input. Surprisingly, most of our attempts revealed that the auditory system is not able to cope with the consequences of rhythmic stimulus processing if we assume similar mechanisms as recently discovered in the visual domain. These results might show us (1) that auditory perception does not fluctuate rhythmically or (2) that auditory perceptual cycles critically differ from those observed in the visual system. We will develop the second alternative and argue that there is a crucial need of the auditory system to adjust its brain rhythms to stimulus input. Using brain stimulation methods in combination with brain imaging, we will support this notion by showing that an interference with this brain-stimulus adjustment has consequences for the processing of speech sounds.

#### **TALK 5: EXTENDED DISCUSSION**

Extended discussion, for example: How can we reconcile the different frequencies in perception and behavior? Most findings are restricted to the visual system - can we transfer findings to other modalities? Is there a supra-modal “driver” of periodic fluctuations in perception and action? The audience will be encouraged to participate in this discussion.

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## **Symposium Session 6**

### **TOP-DOWN ATTENTION TO TIME: A NEURAL OSCILLATORY PERSPECTIVE**

Monday, March 26, 10:00 am - Noon, Back Bay C&D

**Chair: Malte Wöstmann, University of Lübeck**

**Speakers: Saskia Haegens, Sanne ten Oever, Anne Keitel, Malte Wöstmann, Randolph Helfrich**

Neural oscillations are thought to organize the rhythmic sampling of sensory information in time. How top-down attention modulates, but also depends on, ongoing oscillatory dynamics is poorly understood. Our speakers will combine recent behavioral, electrophysiological, and brain stimulation evidence to elucidate on the interplay of top-down attention and behaviorally relevant neural oscillations. The symposium will start out with a focus on entrained neural oscillations during temporal attention. Saskia Haegens will demonstrate that information about the timing of an upcoming target stimulus shapes neural entrainment and its relation to target discrimination. Sanne ten Oever will then show that neural oscillatory phase, but also power, prior to stimulus onset determines how participants make use of temporal information. Next, we will focus on top-down attention to human speech, which is one of the most abundant sensory signals with inherent rhythmic structure in human environments. Anne Keitel will highlight the importance of neural tracking of speech rhythms on different timescales for successful comprehension. Further support for

the functional significance of neural oscillations for attention will be presented by Malte Wöstmann, who will show that experimentally induced enhancements of oscillatory power modulate attention to speech in time and space. Finally, Randolph Helfrich will combine (non-)invasive electrophysiological and brain stimulation evidence into an integrative framework, which posits that the prefrontal cortex orchestrates oscillatory dynamics in sensory networks to implement attentional selection. The symposium will be of significance to CNS members interested in the neuroscience of attention and in the neural oscillatory foundations underlying cognitive control.

#### **TALK 1: RHYTHMIC FACILITATION OF TEMPORAL ATTENTION AS REVEALED BY PSYCHOPHYSICS AND MEG**

**Saskia Haegens<sup>1</sup>; <sup>1</sup>Department of Neurosurgery, Columbia University Medical Center, New York**

Here, we studied the oscillatory dynamics involved in temporal attention, specifically, neuronal entrainment to slow frequency rhythms (1–7 Hz). We conducted a series of psychophysics and MEG experiments, testing rhythmic synchronization as a mechanism for focusing attention on relevant input. Subjects performed an auditory/visual discrimination task in which they received a temporal cue, which was either informative (rhythmic condition) or not informative (random condition) about the timing of the upcoming target. We found that when a target is presented in-phase with the cued rhythm (expected), performance is modulated as compared to both the out-of-phase (unexpected) and the random-mode (uninformative) conditions. We found that this holds for a range of rhythms, and that subjects can pick up rhythmic structure both explicitly and implicitly. Critically, reaction times were substantially faster when the task rhythm was increased. We then looked into the neural correlates of these effects and found increased delta band synchronization, as measured by inter-trial phase coherence, in the rhythmic compared to the random condition. This was sustained after the cue, and correlated with task performance: subjects with higher delta synchronization were faster at the task in general, and rhythmic (but not random) trials with higher delta synchronization led to faster responses. Combined, these experiments demonstrate that the brain can pick up on relevant rhythms in sensory input, even in the absence of ongoing rhythmic stimulation, and that this affects behavioral performance.

#### **TALK 2: EEG POWER AND PHASE INFLUENCE TRIAL-BY-TRIAL BEHAVIORAL RESPONSES IN A TEMPORAL ASSOCIATION TASK**

**Sanne ten Oever<sup>1</sup>, Alexander T. Sack<sup>1</sup>; <sup>1</sup>Department of Cognitive Neuroscience, Faculty of Psychology and Neuroscience, Maastricht University**

Temporal information can guide our attentional resources to specific moments in time. It has been proposed that slow frequency oscillations guide this temporal prediction by aligning ongoing oscillations to

incoming predictable input. However, temporal predictions are rarely independent of content predictions. To illustrate, the cuckoo that shows itself at twelve o'clock drives the interest, not the mere fact of it being twelve o'clock. In this paradigm we combined both content and temporal information in a temporal association task. We presented rhythmic stimulus streams of visual images (between 3 – 8 Hz) after which an auditory stimulus was presented either at 50 ms or 50 ms +  $\pi$  (half a cycle) after the last image onset. Sounds needed to be categorized in one of two categories. Category A sounds had a 70% probability to be presented at time point 1 and 30% at time point 2. For sound B these probabilities were reversed. We analyzed data of the last three visual images prior to sound onset and related this to behavioral performance. Two main effects could be dissociated: 1) trials that were preceded with trials of high power at the presentation rate tended to be followed with responses inconsistent with the temporal association. 2) Trials with association inconsistent and consistent responses had a significantly different mean phase at the presentation rate. These results indicate that both power and phase influence how temporal information guides our behavioral responses. Moreover, it suggests that oscillatory responses contain information about content as well as time.

### **TALK 3: NEURAL TRACKING OF DIFFERENT TEMPORAL SCALES OF SPEECH PREDICTS SUCCESSFUL SPEECH-IN-NOISE COMPREHENSION**

**Anne Keitel<sup>1</sup>, Joachim Gross<sup>1,2</sup>, Christoph Kayser<sup>1,3</sup>; <sup>1</sup>Institute of Neuroscience and Psychology, University of Glasgow, <sup>2</sup>Institute for Biomagnetism and Biosignalanalysis, University of Münster, <sup>3</sup>Cognitive Neuroscience, Bielefeld University**

During speech perception, neural oscillations track slow acoustic fluctuations in the envelope of the speech signal. Speech tracking involves bottom-up processes, based on acoustic properties, and top-down processes, based on predictions of upcoming speech segments. We looked at the contributions of auditory and motor regions to these processes in a magnetoencephalography study using a speech-in-noise paradigm. We implemented two novel aspects to gain specificity about speech-tracking processes. First, we based our analyses on stimulus-specific time-scales, such as the rate of phrases and words. Second, we analyzed single-trial comprehension to focus on the perceptual relevance of speech-tracking processes. Our results yielded two different speech-tracking processes relevant for comprehension: First, the left middle temporal cortex tracks speech at the word time-scale (1.8–3 Hz), which is useful for word segmentation and mapping the sound-to-meaning. And second, the left premotor cortex tracks speech at the phrasal time-scale (0.6–1.3 Hz), likely indicating the use of top-down temporal predictions during speech perception. Previous studies suggest that the motor system is involved in predicting the timing of upcoming stimuli by using its intrinsic beta rhythm. We therefore hypothesized that a cross-frequency coupling between beta-power and delta-phase at the phrasal time-scale would be present in the motor system. Indeed, we demonstrate that the motor

system can exploit temporal regularities in speech via a delta-beta coupling mechanism and this is directly relevant for comprehension. To summarize, by using stimulus-specific frequency bands and single-trial comprehension, we show specific functional and perceptually relevant speech-tracking processes along the auditory-motor pathway.

### **TALK 4: STIMULATING THE NEURAL OSCILLATORY DYNAMICS OF AUDITORY ATTENTION TO TIME AND SPACE**

**Malte Wöstmann<sup>1</sup>, Lea-Maria Schmitt<sup>1</sup>, Jonas Obleser<sup>1</sup>; <sup>1</sup>Department of Psychology, University of Lübeck**

When humans focus attention to the auditory modality, the power of alpha oscillations (~10 Hz) in the magneto/electroencephalogram (M/EEG) increases. I will present two studies to demonstrate that experimentally induced enhancements in alpha power have the potency to modulate auditory attention to time and space. In both studies, listeners attended to one of two streams of spoken numbers. First, the two streams were separated in space during dichotic listening, which is known to enhance alpha power in the hemisphere ipsilateral to the attentional focus. While participants ( $n = 20$ ) performed the task, we applied continuous 10-Hz transcranial alternating current stimulation (tACS) to left-hemispheric temporo-parietal cortex regions. Compared to sham, alpha-tACS enhanced recall of target numbers in 'attend-left' versus 'attend-right' trials. When we stimulated at gamma frequency (47 Hz) in a separate session, this effect was precisely reversed, which suggests that externally amplified oscillations can enhance spatial attention and facilitate attentional selection. Second, when the two speech streams alternated in time, listeners' ( $n = 22$ ) occipito-parietal alpha power in the EEG was modulated rhythmically, with peaks and troughs placed at the onsets of attended and ignored numbers, respectively. Listeners were instructed to close their eyes during every other block, which not only enhanced baseline alpha power but also the attention-induced rhythmic modulation thereof. This finding speaks to a stronger neural separation of attended versus ignored sound in a regime of high alpha power with closed eyes. I will argue that alpha oscillations constitute an important top-down signal to implement attentional selection.

### **TALK 5: OSCILLATORY BRAIN ACTIVITY DETERMINES THE TIMESCALE OF HUMAN COGNITION**

**Randolph Helfrich<sup>1</sup>; <sup>1</sup>Helen Wills Neuroscience Institute, University of California Berkeley**

Electrophysiological recordings in humans reveal rich intrinsic temporal dynamics, which are thought to support sensory and cognitive processing. However, it remains unclear how time-varying neural activity supports our continuous perception of the world. In an alternative account, it has been hypothesized that perception and cognition might not operate in a continuous but in a rhythmic mode, where endogenous oscillatory brain activity could periodically sample the environment, thus, rendering perception discrete. In this talk, I discuss recent advances that collectively suggest that endogenous oscillatory brain activity shapes the timescale of top-down guided

visual perception. In particular, alpha band oscillations (8-12 Hz) support the discrete sampling of the visual environment, while rhythmic activity in the delta and theta range (2-7 Hz) mediates context-guided and rule-guided top-down control. By combining psychophysics with non-invasive (EEG) and invasive (ECoG) electrophysiological recordings as well as non-invasive brain stimulation methods (tACS) in humans, I will provide evidence supporting the notion that perception and cognition exhibit behaviorally-relevant intrinsic temporal profiles that are shaped by neural activity at the population level and are mediated by the prefrontal cortex (PFC). Based on converging evidence I propose a framework in which the PFC serves as a conductor to orchestrate task-relevant networks through the selective modulation of oscillatory dynamics, such as phase resetting, endogenous entrainment and cross-frequency coupling. Taken together, I posit that the functional architecture of cognition is inherently rhythmic and neuronal activity at the population level determines the timescale of top-down guided visual perception.

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## Symposium Session 7

### DEVELOPMENTAL COGNITIVE NEUROSCIENCE: BRAIN CONSTRUCTION FROM THE FETUS THROUGH OLD AGE

Monday, March 26, 10:00 am - Noon, Constitution Ballroom

**Chair:** Nim Tottenham, Columbia University

**Speakers:** Moriah E. Thomason, Nim Tottenham, Adriana Galvan, Ting Xu,

Human brain function shows incredible dynamics across the lifespan, requiring up to two decades to reach maturity and then continuing to evidence change into older ages. Those first two decades comprise a highly changeable and plastic state of the human brain, when environmental and genetic actions are among the greatest in one's lifetime. The current symposium takes a developmental approach to understanding human brain function, focusing on this prolonged construction across the first two decades of life and beyond. Attention is paid to normative developmental trends, and also to developmental pathways that lead towards psychopathology. Talks will consider the fetal, childhood, adolescent, and adult trajectories, with a focus on subcortical and cortical functional connectivity development. Special emphasis will be placed on relevant environmental influences at each stage, facilitating discussions on sensitive periods for human brain development. The first talk describes resting state functional connectivity in the fetus and the influences of maternal stress on prenatal brain development. The second talk transitions to childhood and describes the action of postnatal sensitive periods on the construction of subcortical-cortical connections. The third talk extends development up to adolescence and focuses on the role of puberty on the neurobiology of risky decision making. The fourth talk takes a broader view of large-scale network dynamics across childhood into young adulthood into aging adulthood. The goal across the four talks

is to bridge across the very long brain development that gives rise to mature functioning.

### TALK 1: STRESS OF A MOTHER IS REFLECTED IN THE DEVELOPING BRAIN OF HER UNBORN CHILD

**Moriah E. Thomason**<sup>1,2,3</sup>, **Marion I. van den Heuvel**<sup>1,2</sup>, **Rebecca Waller**<sup>3</sup>, **Elise Turk**<sup>4</sup>, **Martijn P. van den Heuvel**<sup>4</sup>, **Janessa H. Manning**<sup>1,2</sup>, **Jasmine Hect**<sup>1</sup>, **Edgar Hernandez-Andrade**<sup>1,2</sup>, **Sonia Hassan**<sup>1,2</sup>, **Roberto Romero**<sup>2,3</sup>; <sup>1</sup>Wayne State University, <sup>2</sup>Perinatology Research Branch, NICHD/NIH/DHHS, <sup>3</sup>University of Michigan, <sup>4</sup>University Medical Center, Utrecht, The Netherlands

Increasing evidence supports a strong link between maternal prenatal stress and altered postnatal brain development. However, whether stress is reflected in brain development prior to birth, and specifically, whether maternal prenatal stress alters fetal functional brain systems, remains an open question. The present study evaluates the potential association between maternal prenatal stress and global efficiency of the fetal neural connectome, in utero. Using recent developments in fetal resting-state fMRI we examined neural functional connectivity in 47 human fetuses scanned between the 30-37th week of gestation. Participating mothers were recruited from a low-resource and high stress urban setting, with many reporting high-levels of depression, anxiety, worry, and stress. We discovered that neural efficiency, a measure reflecting how economically neural functional systems are organized, was reduced in fetuses of mothers reporting high prenatal stress. This effect was pronounced in areas of the cerebellum, postcentral gyrus, temporal lobes, and cingulate. It appears that reduced integration of neural systems across gestation may be a consequence of stress programming during pregnancy. This discovery informs what has long been speculated, that the stress of a mother during her pregnancy has an impact on neural connections in the brain of her unborn child.

### TALK 2: CORTICO-AMYGDALA CONNECTIVITY DEVELOPMENT: THE IMPORTANCE OF CHILDHOOD

**Nim Tottenham**<sup>1</sup>; <sup>1</sup>Columbia University

Cortico-amygdala connectivity is fundamental to mature emotional behaviors. While the "top-down" (i.e., cortical-to-amygdala) regulatory role of these connections has been the focus of most studies in adulthood, we propose that amygdala-to-cortical connections in childhood are necessary developmental prerequisites for establishment of mature neural phenotypes. The current talk presents evidence showing that connections between the amygdala and medial prefrontal cortex (mPFC) develop very slowly over childhood and adolescence. Moreover, I present evidence consistent with a more excitatory pattern of connections between amygdala and mPFC in childhood than in adulthood. This pattern, which shows conservation across species, undergoes a dramatic shift towards the end of childhood when the transition to adolescence brings about more adult-like characteristics. I will present cross-sectional and longitudinal developmental functional magnetic resonance imaging data



describing age-related changes (beginning at 4-years-old) in amygdala-mPFC circuitry throughout childhood and adolescence and how they relate to emerging affective behavior. Additionally, examination of coincident environmental events in childhood suggests that amygdala-mPFC phenotypes of childhood are highly impressionable to external forces, raising the possibility that childhood is a sensitive period for the construction of amygdala-mPFC learning.

### **TALK 3: THE DEVELOPING ADOLESCENT BRAIN: INSIGHTS FROM COGNITIVE NEUROSCIENCE**

**Adriana Galvan<sup>1</sup>; <sup>1</sup>University of California, Los Angeles**

Research on the adolescent brain has exploded in the past decade, providing insight into characteristic adolescent behavior. The brain undergoes rapid development in the first few years of life. With increasingly sophisticated cognitive neuroscience tools over the past two decades, we have learned that when puberty strikes, there is another burst of activity in the developing brain. As children become teenagers, the brain begins what will be the final stretch of its development, dynamically strengthening and weakening connections among key regions in response to environmental input. This process is crucial to making the developmental leap from relative immaturity to a more mature state. However, similar to other developmental milestones, there are vast individual differences in the rate at which individuals undergo increases in brain communication. In this talk, I will review neural systems that undergo ongoing brain maturation as individuals transition into and out of adolescence, how these developmental changes relate to risky decision making, reward sensitivity, and learning in adolescents, and the implications for legal and social policies relevant to young people.

### **TALK 4: MAPPING CHANGES IN BRAIN AREAL ORGANIZATION ACROSS DEVELOPMENT AND BEYOND**

**Ting Xu<sup>1,2</sup>, Michael Milham<sup>1,3</sup>; <sup>1</sup>Center for the Developing Brain, Child Mind Institute, <sup>2</sup>Chinese Academy of Sciences, <sup>3</sup>Center for Biomedical Imaging and Neuromodulation, Nathan S. Kline Institute for Psychiatric Research**

Models of human brain development have long posited that functional areas become increasingly segregated during the first two decades of life. However, a comprehensive mapping of changes in areal organization during brain development has remained elusive. Here we map age-related changes in brain organization during development, and beyond, using recently developed gradient-based methods for full brain cortical parcellation. Specifically, we mapped gradients in intrinsic functional connectivity similarity (Wig et al., 2013; Gordon et al., 2014) at the individual level, 2) employed multivariate distance matrix regression (MDMR; Shehzad et al., 2014) to identify age-related linear- and quadratic-changes in functional transition profile (i.e. spatial gradient of intrinsic function connectivity). By using 323 datasets selected from the Enhanced Nathan Kline Institute-Rockland Sample (NKI-RS) dataset (ages 5-85), we were not only able to test hypotheses regarding age-related increases in areal segregation

during development, but that this phenomena reverses later in life, with areal organization becoming more diffuse. Our analyses revealed linear age effects in posterior cortex, particularly in primary visual, sensorimotor, and default mode networks. The quadratic effects were mainly located in the regions of network borders e.g. default mode, ventral attention. Finally, at each vertex, we used MDMR to detect age-related variation (linear, quadratic) in the gradient maps defined across individuals. The linear and quadratic age-related effects were predominantly located in the regions of network borders, e.g. default mode, ventral attention, dorsal attention and frontoparietal network. These findings not only provide insights into the development of the areal organization of the brain, also raise cautions for efforts using atlases and group-level parcellations to guide graph-theoretical examinations.

### **TALK 5: Q&A PERIOD**

The speakers will take questions from the audience.

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## **Symposium Session 8**

### **MECHANISMS OF SLEEP'S ROLE IN MEMORY AND EMOTION PROCESSING**

Tuesday, March 27, 1:30 - 3:30 pm, Back Bay A&B

**Chair: Rebecca Spencer, University of Massachusetts, Amherst**

**Co-Chair: Jan Born, <sup>1</sup>University of Tübingen**

**Speakers: Sara C. Mednick, Jan Born, Jessica Payne, Rebecca Spencer, Rebecca Spencer**

Memory consolidation, the transformation of recent experiences into long-term memory, occurs over a period of days, months, and years and depends on sleep. However, how and which new experiences are consolidated into long-term memory is not understood. Furthermore, memory stages (encoding, consolidation, retrieval) are known to change with aging. Understanding the role of sleep in these stages will reveal important fundamental mechanisms of memory. In this symposium, four speakers will discuss recent advances in this field that have provided mechanistic insight into sleep's role in cognitive processing, using diverse approaches and age groups. Dr. Sara C. Mednick will demonstrate new findings on the role of temporal coupling between the autonomic and central nervous systems during sleep that contribute to memory formation. Dr. Jan Born will present findings on the interaction between emotional and non-emotional aspects of episodic memory consolidation, providing evidence that emotional memories may be preferentially consolidated during sleep, suggesting additional sleep-dependent processing beyond that of neutral memories. Dr. Jessica Payne will discuss selective emotional memory consolidation in middle aged adults demonstrating that, in this understudied age-group, slow wave sleep during a daytime nap supports emotional memory consolidation although this process weakens with age. Finally, Dr. Rebecca Spencer will present evidence

of slow wave-dependent emotional memory processing in both children and older adults, suggesting that this mechanism is preserved with aging and development, although altered by other processes (e.g., memory biases and sleep distribution).

### **TALK 1: INVESTIGATING AUTONOMIC AND CENTRAL NERVOUS SYSTEM CONTRIBUTIONS TO MEMORY CONSOLIDATION DURING SLEEP.**

**Sara C. Mednick<sup>1</sup>, Mohsen Najj<sup>1</sup>, Lauren Whitehurst<sup>2</sup>; <sup>1</sup>University of California Irvine, <sup>2</sup>University of California Riverside**

New memories need to be transformed into more stable representations or they will be forgotten. Just as there are many forms of memory, there are likely many routes whereby these recent memories can be consolidated. It is well established that sleep is one period optimized for consolidation (Mednick, 2015). A different line of research has demonstrated a significant contribution of the autonomic nervous system (ANS) for memory consolidation during waking (McGaugh, 2013). Post-encoding vagotomy impairs memory in rodents (Williams & Jensen, 1993). In humans, vagal nerve stimulation during declarative verbal memory consolidation enhances recognition memory (Clark, Naritoku, Smith, Browning, & Jensen, 1999). In addition, we have recently shown that ANS activity during sleep is associated with memory consolidation of both repeated (declarative) and primed (non-declarative) memories (Whitehurst, Cellini, McDevitt, Duggan, & Mednick, 2016). Together these findings suggest that interactions between the central and autonomic nervous system during sleep may play a role in sleep-dependent memory processes. In my talk, I will address the question: What is the role of the autonomic nervous system in sleep-dependent memory consolidation? For this question, I will first review findings on the role of the parasympathetic nervous system in sleep-dependent cognitive processes with our recent data on heart rate variability and its contribution to memory improvement. Second, I will show new findings using high-temporal resolution analysis of heart/brain signals via electroencephalography (EEG) and autonomic heart beat-to-beat intervals (RR intervals) from electrocardiography (ECG) during wake and daytime sleep. Using this technique we have identified bursts of ECG activity that last 4-5 seconds and predominate in non-rapid-eye-movement sleep (NREM). Using event-based analysis of NREM sleep, we found an increase in memory-related sleep events 5 secs prior to peak of the heart rate burst, as well as a surge in vagal activity. Furthermore, these Autonomic/Central Events (ACE) positively predict post-nap improvement in a declarative memory task above and beyond sleep without ACE activity. These results provide the first evidence that coordinated autonomic and central events play a significant role in declarative memory consolidation. In summary, I will illustrate a dynamic relationship that exists between the autonomic and central nervous system that facilitates the consolidation of recent experiences into long-term memories.

### **TALK 2: INTERACTING EFFECTS OF EMOTIONAL AND EPISODIC MEMORY CONSOLIDATION DURING SLEEP**

**Jan Born<sup>1</sup>, Elaina Bolinger<sup>1</sup>; <sup>1</sup>University of Tübingen**

Emotions can be considered as a set of responses (expressed via autonomic nervous system, verbal report, etc) that emerge during experienced episodes, i.e., events (items) occurring in a specific spatio-temporal context (source). Sleep is known to enhance memory for episodes, with this effect conveyed mainly by slow wave sleep (SWS). Also, sleep is thought to particularly enhance emotional memories, with this effect mainly conveyed through rapid eye-movement (REM) sleep. It is thus far unclear how processes of episodic and emotional memory consolidation interact during sleep. Which aspect of episodic memory (item, source) is enhanced by emotional memory consolidation during sleep, and which is the sleep stage (SWS or REM) that produces this enhancement? To shed light on these questions, in my talk I will concentrate on two studies in healthy volunteers (Groch et al. 2015, Bolinger et al. 2017). In the first, we presented aversive and neutral pictures (items) on a screen together with colored frames (source) shortly preceding the presentation of the picture, before early-night SWS-rich or late-night REM sleep-rich retention intervals, and thereafter retrieval was tested. Only after REM-rich sleep, and not after SWS-rich sleep, was there a significant emotional enhancement, i.e., a superior retention of emotional over neutral pictures. After SWS-rich sleep the retention of picture-frame associations was better than after REM-rich sleep. However, this benefit was observed only for neutral pictures; and it was completely absent for the emotional pictures. We concluded that REM sleep favors the emotional enhancement specifically of item memory whereas SWS enhances the item-source binding. But, strong emotional enhancement of item memory might impair SWS-induced strengthening of item-source binding. In the second study, we presented aversive and neutral pictures before and after periods of sleep and wakefulness, and analysed the enhancement in the emotional response using different measures, i.e., heart rate deceleration (HRD), subjective ratings and the late positive EEG potential response (LPP). Sleep increased the emotional response in HRD with this effect being associated with REM sleep theta activity, whereas sleep decreased the emotional response in ratings and the LPP. Overall, we conclude that REM sleep enhances emotional item memory with this effect coupled to an enhancing effect on the automatic emotional (HRD) response. Concurrently, SWS enhances episodic memory aspects (source, item-source coupling), and this effect might favor enhanced cognitive control of emotions as reflected in sleep induced decreases in LPP and subjective ratings.

### **TALK 3: PREFERENTIAL CONSOLIDATION OF EMOTIONALLY SALIENT INFORMATION DURING A NAP IS PRESERVED IN MIDDLE AGE**

**Jessica Payne<sup>1</sup>, Sara Alger<sup>2</sup>; <sup>1</sup>University of Notre Dame, <sup>2</sup>Walter Reed Army Institute of Research**

Sleep preferentially preserves aspects of memory that are most salient and valuable to remember, often at the expense of memory for less relevant details. One example of such a selective memory effect is observed when examining memory for complex emotional experiences. We consistently find that memory for the emotionally salient focus of the episode is preferentially preserved, while memory for neutral, contextual detail is forgotten or even suppressed. Importantly, the magnitude of this 'emotional memory trade-off effect' increases over a period of sleep (Payne et al., 2008; Payne & Kensinger, 2011), demonstrating that this phenomenon is not simply the product of attentional factors during encoding, but to active processes unfolding during sleep (Bennion et al., 2015). Both daytime naps (Payne et al., 2015) and nocturnal sleep (Payne et al., 2008, 2012) enhance the emotional memory trade-off effect, with memory for emotional components correlated with slow wave sleep (SWS) during the day and rapid eye movement (REM) sleep overnight. These studies have primarily sampled from young adult populations. However, both sleep and memory are altered by middle age. Thus, the aim of the present study was to examine how increasing age affects sleep-based mechanisms of emotional memory prioritization, using a daytime nap protocol to compare young to middle-aged adults – an understudied age group. In both age groups, a nap soon after encoding scenes that contained a negative or neutral object on a neutral background led to superior retention of memory for emotional objects at the expense of memory for the neutral backgrounds. Properties of SWS were related to memory for salient information, although we demonstrate that these relationships weaken with age.

#### **TALK 4: CHANGES IN SLEEP-DEPENDENT EMOTIONAL MEMORY PROCESSING WITH AGING AND DEVELOPMENT.**

**Rebecca Spencer<sup>1</sup>, Bethany Jones<sup>1</sup>, Amanda Cremonese<sup>1</sup>;**  
**<sup>1</sup>University of Massachusetts, Amherst**

Sleep is critically involved in emotional regulation and emotional memory in young adults. Although this process has been associated with REM sleep, it is clear from recent studies that slow wave sleep (SWS) also plays a role. However, both sleep and emotion processing evolve across development and with aging. Thus, we will present two studies investigating the role of sleep in emotional memory and reactivity in both children and older adults. In the first study, we will present findings from early childhood (3-5 yrs), an age characterized by daytime naps. Although the architecture of naps mimics that of overnight sleep, REM sleep is largely absent in naps at this age. When children are presented with emotional faces prior to the nap or an equivalent interval awake, memory for the items is similar when subsequently probed. However, when probed again the next day, memory is greater when the children napped following learning the prior day. Moreover, using a Dot Probe task, we find that the emotional attention bias present prior to the nap/wake interval is reduced following a nap but not when children stay awake during naptime. Importantly, this benefit of sleep on emotional attention regulation is specifically associated with slow wave activity. In a second study, we

likewise assessed emotional memory following intervals of sleep (in this case overnight sleep) and wake in young (18-26 yrs) older (50-80 yrs) adults using an emotional picture paradigm. Compared to waking, sleep preserved subjective reactivity and memory for positive but not negative pictures in older adults and negative but not positive pictures in young adults. Memory for positive pictures in older adults was associated specifically with time spent in SWS. Furthermore, SWS was related to the ratio of positive to negative affect in older adults and inversely related to this ratio in young adults. These relationships were strongest for older adults with high memory for positive pictures and young adults with high memory for negative pictures. Collectively, these studies support a role of SWS in emotional memory processing across the lifespan in spite of changes in sleep architecture. Yet, changes in sleep distribution across the day and memory bias nonetheless contribute to developmental and age-related changes in sleep-dependent emotion processing.

#### **TALK 5: FACILITATED DISCUSSION**

**Rebecca Spencer<sup>1</sup>; <sup>1</sup>University of Massachusetts, Amherst**

We will use about 2-5 mins to introduce basic concepts and present an overview of the symposium. We will use the remaining time at the end of the symposium for a facilitated discussion - with a summary slide and themes presented for 2-5 mins to help facilitate the Q&A.

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## **Symposium Session 9**

### **NEURAL DEDIFFERENTIATION AND AGE-RELATED COGNITIVE DECLINE**

Tuesday, March 27, 1:30 - 3:30 pm, Back Bay C&D

**Chair: Joshua Koen, University of Texas at Dallas**

**Co-Chair: Michael Rugg, University of Texas at Dallas**

**Speakers: Thad A. Polk, Caitlin Bowman, Joshua D. Koen, Morgan D. Barense, Michael D. Rugg**

Aging is associated with a decline in the regional specificity and precision of neural representations and the processes that operate on them. This decline has been referred to as age-related neural dedifferentiation. It has been studied most frequently in extra-striate visual cortex, with several reports that older adults show lower regional specificity in their neural responses to different visual categories than their younger counterparts. This symposium will present research that goes beyond these earlier observations to shed light on possible mechanisms underlying neural dedifferentiation and to link it to age-related performance differences in a variety of cognitive domains. Thad Polk will present findings that link age-related differences in cortical GABA availability to neural dedifferentiation in a number of brain regions, and to differences in 'fluid' cognitive functions. Caitlin Bowman will discuss how reductions in the fidelity of neural representations are associated with age-related increases in false memory. Joshua Koen will provide evidence that neural

dedifferentiation plays a role in the well-known difficulties of older adults in episodic memory encoding. Finally, Morgan Barense will report that the impoverished representations of visual objects that are characteristic of Alzheimer's disease are associated with abnormal viewing patterns related to volumetric reductions in entorhinal cortex. Together, the presentations and subsequent discussion will highlight the importance of neural dedifferentiation to the understanding of age-related differences in cognitive performance, link the phenomenon to broader notions of dedifferentiation current in the cognitive aging literature, and identify important avenues for future research.

### **TALK 1: AGE-RELATED NEURAL DEDIFFERENTIATION: SCOPE, CAUSE, AND CONSEQUENCES**

**Thad A. Polk<sup>1</sup>; <sup>1</sup>University of Michigan**

Previous work has found evidence for age-related neural dedifferentiation in visual cortex: Neural activation patterns in response to different visual stimuli are less distinctive in older compared with younger adults. Furthermore, individual differences in neural distinctiveness predict individual differences in behavior across a range of fluid processing tasks. Animal work suggests that age-related reductions in the inhibitory neurotransmitter GABA might play a role, but GABA has not been extensively studied in human aging. In this talk, I'll present results from the Michigan Neural Distinctiveness (MiND) project investigating the scope, cause, and consequences of age-related neural dedifferentiation in humans. We are using functional magnetic resonance imaging to measure the distinctiveness of neural activation patterns in response to faces vs. houses in visual cortex, in response to speech vs. music in auditory cortex, in response to left- vs. right-hand button presses in motor cortex, and in response to left- vs. right-hand vibrotactile stimulation in somatosensory cortex. We also use magnetic resonance spectroscopy to measure resting GABA levels in visual, auditory, and sensorimotor cortex in the same individuals. Finally, all participants complete an extensive battery of behavioral tasks. In this talk, I'll present data showing that (1) neural distinctiveness declines with age in multiple cortical regions, not just visual cortex; (2) GABA levels also decline with age across cortical regions; (3) participants with higher GABA levels exhibit greater neural distinctiveness; and (4) participants with higher GABA levels and greater neural distinctiveness perform better on a range of fluid, but not crystallized, processing tasks.

### **TALK 2: INVESTIGATING DEDIFFERENTIATION IN VISUAL CORTEX UNDERLYING FALSE MEMORIES IN AGING**

**Caitlin Bowman<sup>1,2</sup>, Christina Webb<sup>1</sup>, Jordan Chamberlain<sup>1</sup>, Nancy Dennis<sup>1</sup>; <sup>1</sup>Penn State University, <sup>2</sup>University of Oregon**

We propose that age-related increases in false recognition are due, in part, to reductions in the fidelity of item representations in visual cortex that help to detect mismatch between targets and lures. To test for age-related dedifferentiation in neural representations we combined univariate analyses with an encoding-retrieval pattern similarity (ERS) analysis in young and older adults to compare the overlap in neural

representations between retrieval lures and their respective targets at encoding. We then aimed to link these similarity patterns to memory performance. Results showed greater ERS for targets and lures compared to completely new items in several regions within the retrieval network. Across age groups, ERS tracked false recognition in inferotemporal cortex and middle temporal gyrus, suggesting that memory representations in these regions lack the specificity necessary to distinguish between targets and related lures. However, age differences were identified in more posterior visual regions, including lateral occipital cortex, where older adults showed similar ERS for both retrieval targets and lures. These representations were linked to both target recollection and lure rejection. Additionally, neural representations in early visual cortex distinguished targets and lures in young, but not older adults. Together, results support the idea that dedifferentiation in aging reflects reduced reactivation of target representations that facilitate lure rejection, contributing to increased false recognition.

### **TALK 3: THE RELATIONSHIP BETWEEN AGE, NEURAL DEDIFFERENTIATION, AND MEMORY ENCODING**

**Joshua D. Koen<sup>1</sup>, Nedra Hauck<sup>1</sup>, Michael D. Rugg<sup>1</sup>; <sup>1</sup>University of Texas at Dallas**

We describe research examining the hypothesis that age-related neural dedifferentiation results in degraded memory representations that contribute to the well-recognized age-related decline in episodic memory. This hypothesis was tested using trial-level neural (BOLD) responses elicited in the parahippocampal place area (PPA) and lateral occipital cortex (LOC) while young and older adults studied pictures of objects and scenes for a subsequent memory task. There were two key findings relating neural dedifferentiation to memory. First, a 'differentiation index' measuring the preferential response of the PPA and LOC to scenes and objects, respectively, predicted across-participant differences in recognition memory. Second, a within category pattern similarity measure (the correlation between across-voxel profiles of BOLD response for a given category member with all other members) was differentially predictive of memory in young and older adults. In young adults, trials that were subsequently recollected were more similar to each other than trials for which subsequent recollection failed. This relationship was not present in older adults. In addition, estimates of within category pattern similarity were lower in older than in young adults. This latter finding suggests that aging is associated with a decline in the stability with which individual events are represented in category-selective cortical regions. Together, the results suggest that age-related neural dedifferentiation is associated with less efficacious encoding processes. They further indicate that neural dedifferentiation is multifaceted, and likely cannot be captured by a single neural index.

### **TALK 4: IMPOVERISHED REPRESENTATIONS OF OBJECT STIMULI REVEALED BY ABNORMAL EYE MOVEMENT BEHAVIOUR**

**Morgan D. Barense<sup>1,2</sup>, Lok-Kin Yeung<sup>3</sup>, Jennifer Ryan<sup>1,2</sup>, Rosanna Olsen<sup>1,2</sup>; <sup>1</sup>University of Toronto, <sup>2</sup>Rotman Research Institute, <sup>3</sup>Columbia University Medical Center**

Alzheimer's disease pathology appears earliest in brain regions that overlap with the anterolateral entorhinal cortex (alERC). However, the representations and the computational properties of the alERC are poorly understood. Previous human studies treat the alERC as an extension of the neighboring perirhinal cortex, supporting object memory. Animal studies suggest that the alERC may support the spatial properties of objects. In a group of older adult humans at the earliest stages of cognitive decline, we used eye movement analyses to show that alterations in alERC volume were related to abnormal visual processing of the spatial attributes of objects. This work suggests that the earliest stages of Alzheimer's disease are associated with a fundamental attentional or perceptual deficit that leads to less precise stimulus representations, which will in turn have cascading effects on many aspects of cognition.

#### **TALK 5: AGE-RELATED NEURAL DEDIFFERENTIATION – SOME POINTS FOR DISCUSSION**

**Michael D. Rugg<sup>1</sup>; <sup>1</sup>University of Texas at Dallas**

In this brief discussion, I will give an overview of the different ways in which the concept of dedifferentiation is applied in the cognitive neuroscience of aging, drawing on the prior presentations for examples. I will discuss whether these different conceptualizations, and the accompanying empirical findings, are consistent with the existence of single, age-sensitive neural mechanism. In addition, I will relate these 'neural' conceptualizations to earlier notions of dedifferentiation that arose from a quite different perspective – the long-standing, but still disputed, observation that performance measures on tasks tapping into different cognitive domains become more correlated with age. The presentation will set the scene for a general discussion between the symposium presenters and the audience.

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## **Symposium Session 10**

### **HIERARCHICAL CORTICAL RHYTHMS AND TEMPORAL PREDICTIONS IN AUDITORY AND SPEECH PERCEPTION**

Tuesday, March 27, 1:30 - 3:30 pm, Constitution Ballroom

**Chair: Anne Keitel, University of Glasgow**

**Co-Chair: Johanna M. Rimmele, Max Planck Institute for Empirical Aesthetics**

**Speakers: Anne Kösem, Benjamin Morillon, Johanna M. Rimmele, Giovanni M. Di Liberto, Andrea E. Martin**

Auditory perception, in particular speech comprehension, involves hierarchical rhythmic processes at distinct acoustic and neural time scales. These processes include the tracking of acoustic fluctuations and linguistic features, as well as temporal predictions about those

units. In this symposium, we will present new empirical data and evidence from computational modelling that highlights specific roles for rhythmic brain activity during auditory and speech processing. The symposium will start with Anne Kösem, who will provide evidence that speech entrainment in the delta and theta bands reflects separate processes that affect intelligibility, and that temporal prediction is a crucial part of entrainment. Benjamin Morillon will further specify the contentious role of motor cortex in generating temporal predictions during auditory perception. Based on this auditory infrastructure, we turn to the representation of different linguistic features in rhythmic brain activity. Johanna M. Rimmele will disentangle lexical and sub-lexical effects on speech segmentation and highlight the role of hierarchical speech networks. Giovanni M. Di Liberto will then present analyses that disentangle the hierarchical contributions of phonetic-level features and speech acoustics to low-frequency entrainment in auditory cortex. Finally, Andrea E. Martin will discuss how hierarchy and rhythm may be organising principles of neural systems for speech and language processing and how they might emerge in different computational architectures (including deep learning and symbolic-connectionist systems). In summary, this symposium features recent empirical findings and theoretical insights that highlight the importance of rhythmic structure, temporal predictions, and hierarchy in auditory, speech, and linguistic processing.

#### **TALK 1: DISSOCIATING THE ROLES OF THETA AND DELTA NEURAL ENTRAINMENT IN SPEECH PROCESSING**

**Anne Kösem<sup>1,2</sup>, Bohan Dai<sup>1,2</sup>; <sup>1</sup>Max Planck Institute for Psycholinguistics, <sup>2</sup>Donders Institute for Brain, Cognition and Behaviour**

While neural oscillations entrain to the dynamics of speech at distinct time scales, it is yet unclear whether neural entrainment observed across studies and frequency ranges reflect the same underlying mechanism. Here, we contrast data from two studies to highlight dissociable roles of neural entrainment in speech perception. The first study provides evidence that neural entrainment reflects temporal predictions, as it is shown to sustain after stimulation and hence to contain information on past speech dynamics. Crucially, sustained entrainment influences speech perception. In addition to temporal predictions based on rhythmic acoustic information, neural entrainment can also be a marker of speech-specific processes. In a second study, we show in a multi-talker environment that the intelligibility of distracting speech influences the comprehension and neural entrainment of attended spoken sentences. In this task, the distracting signals are noise-vocoded speech that are initially unintelligible but become intelligible via training. Noise vocoded distractors impair more strongly the understanding of target speech after training (i.e. when they are intelligible) than before training.

Neural entrainment to target speech also diminishes in the presence of an intelligible distractor, suggesting that entrainment here reflects disrupted linguistic processing of attended speech due to competition. Importantly, temporal predictability effects are observed at frequency ranges associated with strong rhythmicity of the speech envelope in the theta range (3-8 Hz), while linguistic modulations of entrainment are only reported for delta oscillations (1-3 Hz). Hence, delta and theta neural entrainment may relate to separate mechanisms occurring at distinct stages of speech analysis.

## **TALK 2: MOTOR ORIGIN OF TEMPORAL PREDICTIONS IN AUDITORY ATTENTION**

**Benjamin Morillon<sup>1</sup>; <sup>1</sup>Aix Marseille University, INSERM**

Temporal predictions are fundamental instruments for facilitating sensory selection, allowing humans to exploit regularities in the world. It is proposed that the motor system instantiates predictive timing mechanisms, helping to synchronize temporal fluctuations of attention with the timing of events in a task-relevant stream. I will present a neurophysiological account for this theory in a paradigm where participants track a slow reference beat while extracting auditory target tones delivered on-beat and interleaved with distractors. At the behavioral level I will show that overt rhythmic movements sharpen the temporal selection of auditory stimuli, thereby improving performance. Capitalizing on magnetoencephalography recordings I will provide evidence that temporal predictions are reflected in Beta-band (~20Hz) energy fluctuations in sensorimotor cortex and modulate the encoding of auditory information in bilateral auditory and fronto-parietal regions. Together, these findings are compatible with Active Sensing theories, which emphasize the prominent role of motor activity in sensory processing.

## **TALK 3: LEXICAL AND SUB-LEXICAL EFFECTS ON SPEECH SEGMENTATION**

**Johanna M. Rimmele<sup>1</sup>, Yue Sun<sup>1</sup>, Georgios Michalareas<sup>1</sup>, Oded Ghitza<sup>1,2</sup>, David Poeppel<sup>1,3</sup>; <sup>1</sup>Max Planck Institute for Empirical Aesthetics, <sup>2</sup>Boston University, <sup>3</sup>New York University**

Linguistic processing may affect the phase-locking of cortical theta oscillations to the speech acoustics, possibly due to a top-down modulation. Specific temporal dynamics might underlie this hierarchical processing, involving connectivity between frontal, motor areas and auditory cortex in the delta- and theta-band. It is unclear, however, at which linguistic level top-down effects occur and which mechanisms underlie this reinforcement. Here, we recorded Magnetoencephalography during a frequency-tagging paradigm to investigate effects of lexical access and sub-lexical contingencies on the temporal segmentation at the syllabic scale. Two experiments were conducted: Experiment 1, with sequences of German (native) and Turkish (foreign) words, and Experiment 2, with sequences of German and Non-Turkish words (without sub-lexical contingencies). Syllable rate was 4 syllables/sec and word rate was 2 words/sec. Acoustic cues and sub-lexical contingencies for word grouping were

removed and controlled between languages. In Experiment 1, we hypothesized brain-wave spectral peaks at 2 Hz due to lexical access, for German stimuli but not for Turkish stimuli. In Experiment 2, the effect of sub-lexical statistics was measured. In both experiments we expected top-down effects to increase connectivity between higher order processing areas and the auditory cortex. Our findings provide evidence for lexical segmentation at 2 Hz in frontal and temporal brain areas. Interestingly, participants were sensitive to sub-lexical contingencies even when listening to a non-native language. Sub-lexical contingencies resulted in broad activation increases in frontal, temporal and motor areas at 2 Hz. The findings provide new insights into the temporal dynamics and localization of hierarchical lexical-related processes.

## **TALK 4: ISOLATING NEURAL INDICES OF CONTINUOUS SPEECH PROCESSING AT THE PHONEME-LEVEL**

**Giovanni M. Di Liberto<sup>1,2,3</sup>, Michael J. Crosse<sup>4</sup>, Alain de Cheveigné<sup>1,2,3,5</sup>, Edmund C. Lalor<sup>3,6</sup>; <sup>1</sup>ENS Paris, <sup>2</sup>CNRS, <sup>3</sup>Trinity College Dublin, <sup>4</sup>Albert Einstein College of Medicine, <sup>5</sup>UCL, <sup>6</sup>University of Rochester**

In recent years it has been firmly established that auditory cortical activity tracks the temporal amplitude-envelope of speech. However, the specific hierarchical levels from which this phenomenon stems remain unclear. Our aim was to clarify whether low-frequency cortical activity tracks phoneme-level features of speech as well as acoustic-level features. To this end, participants were presented with natural speech from an audio-book while non-invasive electroencephalographic (EEG) signals were recorded. Parts of the EEG signal that differentially reflect responses to either phonemic units or acoustic attributes were identified by means of a regularised ridge regression analysis. This demonstrated that low-frequency cortical tracking of speech entails more than responses to acoustic-level attributes and, concurrently, this provides us with a novel framework to isolate cortical tracking of different speech attributes. A second study was conducted to further assess this framework and, specifically, its ability to isolate and quantify cortical tracking to phonetic features from the responses to speech acoustics. This involved implementing a perceptual pop-out paradigm that, by providing or not providing prior predictive knowledge on the upcoming stimuli, allowed for the comparison between two conditions consisting of the same stimulus but different perceived clarity. Our findings show an impact of prior information on phoneme-level cortical tracking in the delta-band (1-4 Hz). Overall, these experiments suggest that a dependent measure of speech processing at the phonemic-level can be derived using non-invasive, low frequency EEG.

## **TALK 5: LINKING LANGUAGE AND OSCILLATIONS THROUGH RHYTHMIC COMPUTATION**

**Andrea E. Martin<sup>1</sup>; <sup>1</sup>Max Planck Institute for Psycholinguistics**

One way to reconcile formal linguistic representations with the physicality of speech given the computational constraints of neural

systems may be to capitalize on time and rhythm in computation. Time naturally encodes relationships between stimuli in the environment, and, in a neural network that is appropriately sensitive, rhythmic activation patterns or oscillations can be incurred by such temporal structure. I will discuss how different neural network architectures, (including deep learning systems and a time-sensitive symbolic-connectionist model) might capitalize on time and rhythm to process sentence structures. I argue that rhythmic computation offers an explicit mechanism for how the brain could process and combine representations across multiple timescales, providing a linking hypothesis between the computation of linguistic representations and oscillations that has nascent but broad implications for discovering the first principles of computation in the human brain.

# Poster Schedule

Poster sessions are scheduled for Saturday-Tuesday in Exhibition Hall C of the Sheraton Boston Hotel. All attendees must present their CNS 2018 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 2018 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 24	1:00 pm – 1:30 pm	1:30 pm – 3:30 pm	5:15 pm – 5:30 pm	5:30 pm
B	Sunday, March 25	7:30 am* – 8:00 am*	8:00 am – 10:00 am	11:30 am – 11:45 am	11:45 am
C	Sunday, March 25	12:00 pm – 1:00 pm	1:00 pm – 3:00 pm	4:45 pm – 5:00 pm	5:00 pm
D	Monday, March 26	7:30 am* – 8:00 am*	8:00 am – 10:00 am	11:30 am – 11:45 am	11:45 am
E	Monday, March 26	1:30 pm – 2:00 pm	2:30 pm – 4:30 pm	5:30 pm – 5:45 pm	5:45 pm
F	Tuesday, March 27	7:30 am* – 8:00 am*	8:00 am – 10:00 am	11:45 am - Noon	Noon

\* **Note 1:** Only scheduled registered poster presenters may enter the exhibit hall during the half hour set-up time. **Note 2:** Remove your poster promptly at take down complete time, so that the next presenter may set up their poster.

## Poster Session A

Saturday, March 24, 1:30-3:30pm

### Poster A1 Behavioural and electrophysiological measurements of lapses in sustained auditory attention

Alice E Milne<sup>1</sup>, Daniel I R Bates<sup>1</sup>, Maria Chait<sup>1</sup>; <sup>1</sup>UCL, London  
Topic Area: ATTENTION: Auditory

### Poster A2 Anticipatory EEG Activity during Somatosensory Selective Attention relates with Executive Function

Staci Meredith Weiss<sup>1</sup>, Rebecca Laconi<sup>1</sup>, Peter Marshall<sup>1</sup>; <sup>1</sup>Temple University  
Topic Area: ATTENTION: Multisensory

### Poster A3 Default-Executive coupling in attention control after traumatic brain injury with task functional magnetic resonance imaging in longitudinal study.

Shun-Chin Wu<sup>1,2</sup>, Lei Wang<sup>1</sup>, Fan-pei Gloria Yang<sup>3</sup>, Furen Xiao<sup>4</sup>;  
<sup>1</sup>Northwestern University, Chicago, IL 60611, USA, <sup>2</sup>National Defense Medical Center, School of Medicine, Taipei, Taiwan, <sup>3</sup>National Tsing Hua University, Hsinchu, Taiwan, <sup>4</sup>National Taiwan University Hospital, Taipei, Taiwan  
Topic Area: ATTENTION: Nonspatial

### Poster A4 Estimation of Mind-Wandering - For the Respondent Conditioning Enhancing the Meta-Awareness Ability to Mind-Wandering

Issaku Kawashima<sup>1,2</sup>, Hiroaki Kumano<sup>1</sup>, Keiko Momose<sup>1</sup>; <sup>1</sup>Faculty of Human Sciences, Waseda University, <sup>2</sup>Graduate School of Human Sciences, Waseda University  
Topic Area: ATTENTION: Other

### Poster A5 Characterizing the influence of attentional state on the fidelity and connectivity of stimulus representations across large-scale brain networks

David Rothlein<sup>1</sup>, Joseph DeGutis<sup>1,2</sup>, Michael Esterman<sup>1,3</sup>; <sup>1</sup>VA Boston Healthcare System, <sup>2</sup>Harvard Medical School, <sup>3</sup>Boston University School of Medicine  
Topic Area: ATTENTION: Other

### Poster A6 Visual search alpha: A novel window into lateralized visual attention processes

Matthew D. Bachman<sup>1</sup>, Berry van den Berg<sup>2</sup>, Lingling Wang<sup>3</sup>, Marissa L. Gamble<sup>4</sup>, Kait Clark<sup>5</sup>, Marty G. Woldorff<sup>1</sup>; <sup>1</sup>Duke University, <sup>2</sup>University of Groningen, <sup>3</sup>GE China, <sup>4</sup>Boston University, <sup>5</sup>University of the West of England  
Topic Area: ATTENTION: Spatial



**Poster A7 Little to no effects of action video games on visuospatial cognition: evidence from intervention and individual differences studies**

Joseph Arizpe<sup>1,2</sup>, Anika Guha<sup>3,4</sup>, Amyeo Jereen<sup>3,5</sup>, Jeremy Wilmer<sup>3</sup>, Joe DeGutis<sup>1,2</sup>; <sup>1</sup>Harvard Medical School, <sup>2</sup>Boston Veterans Affairs Medical Center, <sup>3</sup>Wellesley College, <sup>4</sup>University of California Los Angeles, <sup>5</sup>University of South Florida

Topic Area: ATTENTION: Spatial

**Poster A8 An ERP study examining false-belief understanding in adolescents**

Elisabeth E.F. Bradford<sup>1</sup>, Victoria E.A. Brunson<sup>1</sup>, Heather Ferguson<sup>1</sup>; <sup>1</sup>University of Kent, U.K.

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster A9 Patterns of neural response during emotional face processing in 3-year-old children: a functional near-infrared spectroscopy study**

Julia Cataldo<sup>1</sup>, Katherine Perdue<sup>1,2</sup>, Ruby Almanza<sup>1</sup>, Hannah Behrendt<sup>1,4</sup>, Charles Nelson<sup>1,2,3</sup>; <sup>1</sup>Boston Children's Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Harvard Graduate School of Education, <sup>4</sup>University Hospital RWTH Aachen

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster A10 Mindfulness-Based Stress Reduction Improves Fear Extinction: An fMRI Investigation**

Gunes Sevinc<sup>1,2</sup>, Britta Hölzel<sup>3</sup>, Muhammed Milad<sup>1</sup>, Sara W. Lazar<sup>1,2</sup>; <sup>1</sup>Massachusetts General Hospital, Division of Psychiatry, <sup>2</sup>Harvard Medical School, <sup>3</sup>Technical University of Munich, Klinikum rechts der Isar

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A11 Impulsivity and Apathy Predict Involvement of Inhibitory Control Regions During Cognitive Interference**

Emily Hahn<sup>1</sup>, Julia Felicione<sup>1</sup>, Aishwarya Gosai<sup>1</sup>, Matthew Boggess<sup>1</sup>, Alex Rockhill<sup>1</sup>, Amy Peters<sup>2</sup>, Alik Widge<sup>1</sup>, Darin Dougherty<sup>1</sup>, Thilo Deckersbach<sup>1</sup>; <sup>1</sup>Massachusetts General Hospital/Harvard Medical School, <sup>2</sup>University of Illinois at Chicago

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A12 Sexually Dimorphic Pupillary Responses During Facial Trustworthiness Evaluation: A Study With Intranasal Oxytocin Administration**

Fatma Gülhan Saraçaydın<sup>1</sup>, Didem Gökçay<sup>1</sup>; <sup>1</sup>Middle East Technical University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A13 Keep calm and carry on: ERP evidence for reduced negative anticipation stress in bilingualism**

Rafal Jonczyk<sup>1,2</sup>, Guillaume Thierry<sup>3</sup>; <sup>1</sup>Adam Mickiewicz University, <sup>2</sup>Pennsylvania State University, <sup>3</sup>Bangor University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A14 Resting State Functional Connectivity Neural Correlates of Emotional Regulation Strategies**

Yush Kukreja<sup>2</sup>, Lauren Goodes<sup>1</sup>, Jeffrey Rouse<sup>2</sup>, Jeremy Cohen<sup>1</sup>; <sup>1</sup>Xavier University of Louisiana, New Orleans, LA, USA, <sup>2</sup>Tulane University, New Orleans, LA, USA

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A15 The Effects of Age and Emotion on Cognitive Control of Memory and Metacognitive Monitoring**

Sara Gallant<sup>1</sup>, Lixia Yang<sup>2</sup>; <sup>1</sup>University of Southern California, <sup>2</sup>Ryerson University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A16 Brain States Encode both Perceived Emotion and the Physiological Response Induced by Visual Stimuli**

Keith A. Bush<sup>1</sup>, Anthony A. Privratsky<sup>1</sup>, Jonathan B. Gardner<sup>1</sup>, Melissa J. Zielinski<sup>1</sup>, Clinton D. Kilts<sup>1</sup>; <sup>1</sup>Brain Imaging Research Center, University of Arkansas for Medical Sciences, Little Rock, AR

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster A17 The Brain Activity in Processing Natural Dynamic Happy Facial Expressions**

Yen-Ju Lu<sup>1</sup>, Shih-tseng T. Huang<sup>1,2</sup>, Sing-Rong Sie<sup>1</sup>; <sup>1</sup>Department of Psychology, National Chung-Cheng University, <sup>2</sup>Center for research in Cognitive Science, National Chung-Cheng University, Taiwan

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster A18 A Cross-Correlation Analysis of the Relationship Between Central and Autonomic Nervous System Activity at Rest**

Derek Spangler<sup>1</sup>, Jean Vettel<sup>1</sup>, Matthew Cieslak<sup>2</sup>, Barry Giesbrecht<sup>2</sup>, Scott Grafton<sup>2</sup>, Gold Okafor<sup>2</sup>, Viktoriya Babenko<sup>2</sup>, Javier Garcia<sup>1</sup>, Justin Brooks<sup>1</sup>; <sup>1</sup>U.S. Army Research Laboratory, <sup>2</sup>University of California, Santa Barbara

Topic Area: EMOTION & SOCIAL: Other

**Poster A19 Comparing human and monkey neural circuits for processing social scenes**

Julia Sliwa<sup>1</sup>, Sadie R Marvel<sup>2</sup>, Geena Ianni<sup>1</sup>, Winrich A Freiwald<sup>1</sup>; <sup>1</sup>The Rockefeller University, New York, <sup>2</sup>Bard College, Annandale-on-Hudson, New York

Topic Area: EMOTION & SOCIAL: Person perception

**Poster A20 Neural Mechanisms Underlying Shifts in Imitative Fidelity**

Kevin Jenson<sup>1</sup>, Gedeon Deak<sup>1</sup>; <sup>1</sup>UC San Diego

Topic Area: EMOTION & SOCIAL: Person perception

**Poster A21 Behavioral and Brain-Imaging Predictors of Working Memory Plasticity in Younger and Older Adults**

Alexandru D. Jordan<sup>1</sup>, Katherine A. Cooke<sup>1</sup>, Kyle D. Moored<sup>2</sup>, Benjamin Katz<sup>3</sup>, Sneha Rajen<sup>1</sup>, Martin Buschkuehl<sup>4</sup>, Susanne M. Jaeggi<sup>5</sup>, John Jonides<sup>1</sup>, Scott J. Peltier<sup>1</sup>, Thad A. Polk<sup>1</sup>, Patricia A. Reuter-Lorenz<sup>1</sup>;

<sup>1</sup>University of Michigan, <sup>2</sup>Johns Hopkins University, <sup>3</sup>Virginia Polytechnic Institute and State University, <sup>4</sup>MIND Research Institute, <sup>5</sup>University of California, Irvine

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster A22 C957T Polymorphism in dopamine D2 receptor gene predicts sequence learning in younger adults**

Beth Westphal<sup>1</sup>, Mark A. Gluck<sup>2</sup>, Jessica R. Petok<sup>1</sup>; <sup>1</sup>St. Olaf College, Northfield, MN, <sup>2</sup>Rutgers University, Newark, NJ

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster A23 The Associations between Obesity and Visceral Adipose Tissue with Cognitive Function and Achievement in Children**

Lauren Raine<sup>1</sup>, Eric Drollette<sup>2</sup>, Shih-Chun Kao<sup>1</sup>, Daniel Westfall<sup>1</sup>, Laura Chaddock-Heyman<sup>2</sup>, Arthur Kramer<sup>1,2</sup>, Naiman Khan<sup>2</sup>, Charles Hillman<sup>1</sup>; <sup>1</sup>Northeastern University, <sup>2</sup>University of Illinois at Urbana-Champaign  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster A24 Resting-State EEG Coherence in Young Children with ADHD: A Potential Neural Marker of ADHD**

Sarah Furlong<sup>1</sup>, Jessica Cohen<sup>1</sup>, Joseph Hopfinger<sup>1</sup>, Jenna Snyder<sup>1</sup>, Margaret Sheridan<sup>1</sup>; <sup>1</sup>University of North Carolina, Chapel Hill  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster A25 Differential effects of prefrontal inhibitory tDCS on voluntary task selection**

Joseph Orr<sup>1</sup>, Michael Imburgio<sup>1</sup>, Jesus Lopez<sup>1</sup>; <sup>1</sup>Texas A&M University  
Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster A26 Sticky Rules: Conjunctions between Rules and Stimulus-Response Codes Drive Action Selection**

Atsushi Kikumoto<sup>1</sup>, Tesufuai Sameshima<sup>1</sup>, Ulrich Mayr<sup>1</sup>; <sup>1</sup>University of Oregon  
Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster A27 Attention from inside out: P1 effects for shifts between internally and externally oriented attention**

Sam Verschooren<sup>1</sup>, Sebastian Schindler<sup>1,2</sup>, Rudi De Raedt<sup>1</sup>, Gilles Pourtois<sup>1</sup>; <sup>1</sup>Ghent University, <sup>2</sup>Bielefeld University  
Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster A28 The role of action, choice, and predictive cues in human reinforcement learning**

Cameron D. Hassall<sup>1</sup>, Greg Hajcak<sup>2</sup>, Olave E. Krigolson<sup>1</sup>; <sup>1</sup>University of Victoria, <sup>2</sup>Florida State University  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster A29 Increasing cognitive control abilities inhibits creative responses, but only if they are not too "far" away: A tDCS study**

Yoed N. Kenett<sup>1</sup>, David S. Rosen<sup>2</sup>, Emilio R. Tamez<sup>1</sup>, Sharon L. Thompson-Schill<sup>1</sup>; <sup>1</sup>University of Pennsylvania, <sup>2</sup>Drexel University  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster A30 Dynamic Reconfiguration of Inhibition Control Network in Different Bilingual Contexts**

Jianqiao Ye<sup>1</sup>, Jing Yang<sup>1</sup>, Ruiming Wang<sup>2</sup>, Ke Zhou<sup>3</sup>, Yan Jing Wu<sup>3</sup>; <sup>1</sup>Bilingual Cognition and Development Lab, Center for Linguistics and Applied Linguistics, Guangdong University of Foreign Studies, Guangzhou, 510420, China, <sup>2</sup>Guangdong Provincial Key Laboratory of Mental Health and Cognitive Science, Center for Studies of Psychological Application, School of Psychology, South China Normal University, Guangzhou 510631, China, <sup>3</sup>College of Psychology and Sociology, Shenzhen University, Shenzhen 518060, China  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster A31 Temporal metacognition as the decoding of internally generated brain dynamics**

Tadeusz Kononowicz<sup>1</sup>, Clemence Roger<sup>2</sup>, Virginie van Wassenhove<sup>1</sup>; <sup>1</sup>CEA/DRF NeuroSpin - INSERM Cognitive Neuroimaging Unit, <sup>2</sup>University of Lille  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster A32 Frontal-midline Theta Neurofeedback Training Increases Flow Experience**

Kathrin C. J. Eschmann<sup>1</sup>, Lisa Riedel<sup>1</sup>, Axel Mecklinger<sup>1</sup>; <sup>1</sup>Saarland University, Saarbrücken, Germany  
Topic Area: EXECUTIVE PROCESSES: Other

**Poster A33 Context-dependent inhibition impairments for executing familiar action task found in patients with frontal glioma**

Chiharu Niki<sup>1</sup>, Takatsune Kumada<sup>2</sup>, Takashi Maruyama<sup>1</sup>, Manabu Tamura<sup>1</sup>, Yoshihiro Muragaki<sup>1</sup>; <sup>1</sup>Tokyo Women's Medical University, <sup>2</sup>Kyoto University  
Topic Area: EXECUTIVE PROCESSES: Other

**Poster A34 Frontoparietal neurostimulation alters the theta-gamma neural code for working memory**

Marian Berryhill<sup>1</sup>, Elizabeth Johnson<sup>2</sup>, Adelle Cerreta<sup>1</sup>, Dwight Peterson<sup>3</sup>, Kevin Jones<sup>4</sup>; <sup>1</sup>University of Nevada, Reno, <sup>2</sup>University of California, Berkeley, <sup>3</sup>Concordia College, <sup>4</sup>Colorado State University  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster A35 Relations Between Hypothalamic-Pituitary-Adrenal Axis and Autonomic Nervous System Activity and Children's Executive Functions in Environments of Early-life Stress**

Stephen Braren<sup>1</sup>, Annie Brandes-Aitken<sup>1</sup>, Clancy Blair<sup>1</sup>; <sup>1</sup>New York University  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster A36 Smoothing over the differences in working memory performance by tACS**

Yuri G. Pavlov<sup>1,2</sup>, Nadezhda V. Pavlova<sup>1,2</sup>; <sup>1</sup>University of Tuebingen, <sup>2</sup>Ural Federal University  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster A37 Default mode network deactivation as a potential biomarker for working memory deficits in brain tumor patients**

Irena Schouwenaars<sup>1</sup>, Miek de Dreu<sup>1</sup>, Geert-Jan Rutten, Nick Ramsey, Johan Jansma; <sup>1</sup>ETZ Elisabeth Hospital, Department of Neurosurgery, Tilburg, the Netherlands  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster A38 Predicting task performance with multivariate pattern decoding using EEG oscillatory activity**

Elaine Astrand<sup>1</sup>; <sup>1</sup>Mälardalen University, Västerås, Sweden  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster A39 IMAGING STRESS EFFECTS ON WORKING MEMORY CAPACITY IN ADOLESCENTS AT-RISK**

Ashley Williams<sup>1,2</sup>, Jessica Graham<sup>1,2</sup>, Candace Killian-Farrell<sup>1</sup>, Josh Bizzell<sup>1</sup>, Hannah Waltz<sup>1</sup>, Erin King<sup>3</sup>, Alana Campbell<sup>1</sup>, Aysenil Belger<sup>1,2</sup>; <sup>1</sup>University of North Carolina at Chapel Hill, Department of Psychiatry, <sup>2</sup>Duke University-UNC Brain and Imaging Analysis Center, <sup>3</sup>Emory University  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster A40 Neural Correlates of the "30 Million Word Gap": Children's language exposure is related to white matter structure**

Rachel Romeo<sup>1,2</sup>, Joshua Segaran<sup>2</sup>, Julia Leonard<sup>2</sup>, Sydney Robinson<sup>2,3</sup>, Meredith Rowe<sup>4</sup>, Allyson Mackey<sup>3</sup>, John Gabrieli<sup>2,4</sup>; <sup>1</sup>Harvard University, Division of Medical Sciences, <sup>2</sup>Massachusetts Institute of Technology, <sup>3</sup>University of Pennsylvania, <sup>4</sup>Harvard Graduate School of Education  
Topic Area: LANGUAGE: Development & aging

**Poster A41 Phase synchronization in the brain's functional reading network during letter processing supports the development of word reading in elementary school children**

Erin White<sup>1,2</sup>, Candace Nayman<sup>1</sup>, Benjamin Dunkley<sup>1,3,4</sup>, Zahra Emami<sup>1</sup>, Anne Keller<sup>1,2</sup>, Taufik Valiante<sup>2,4,5</sup>, Elizabeth Pang<sup>1,2,3,4</sup>; <sup>1</sup>Sick Kids Research Institute, Peter Gilgan Centre for Research and Learning, The Hospital for Sick Children, 686 Bay Street, Toronto, Ontario, Canada, M5G 0A4, <sup>2</sup>Epilepsy Research Program of the Ontario Brain Institute, 438 University Ave., #1618, Toronto, Ontario, Canada, M5G 2K8, <sup>3</sup>The Hospital for Sick Children, 555 University Ave., Toronto, Ontario, Canada, M5G 1X8, <sup>4</sup>University of Toronto, Toronto, Ontario, Canada, M5T 1W7, <sup>5</sup>Krembil Research Institute, University Health Network and Toronto Western Hospital, 399 Bathurst St., Toronto, Ontario, Canada, M5T 2S8  
Topic Area: LANGUAGE: Development & aging

**Poster A42 Tracking Attention to Spoken Language using EEG Alpha Oscillations**

Megan Boudewyn<sup>1</sup>, Cameron Carter<sup>1</sup>; <sup>1</sup>University of California, Davis  
Topic Area: LANGUAGE: Other

**Poster A43 Neural responses during procedural memory tasks are related to foreign language learning outcomes**

Tyler Perrachione<sup>1,2</sup>, Stuart Babcock<sup>1</sup>, Michelle Han<sup>2</sup>, John Salvatore<sup>2</sup>, Jennifer Minas<sup>2</sup>, Amy Finn<sup>2,3</sup>, John Gabrieli<sup>2</sup>, Zhenghan Qi<sup>2,4</sup>; <sup>1</sup>Boston University, <sup>2</sup>Massachusetts Institute of Technology, <sup>3</sup>University of Toronto, <sup>4</sup>University of Delaware  
Topic Area: LANGUAGE: Other

**Poster A44 Multi-modal and task-modulated inter-hemispheric connectivity changes after left arcuate resection**

Benjamin Chernoff<sup>1</sup>, Alexander Teghipco<sup>1</sup>, Frank Garcea<sup>1,2</sup>, Max Sims<sup>1</sup>, Susan Smith<sup>3</sup>, Webster Pilcher<sup>3</sup>, Bradford Mahon<sup>1,2,3,4</sup>; <sup>1</sup>Department of Brain & Cognitive Sciences, University of Rochester, USA, <sup>2</sup>Center for Visual Science, University of Rochester, USA, <sup>3</sup>Department of Neurosurgery, University of Rochester Medical Center, USA, <sup>4</sup>Department of Neurology, University of Rochester Medical Center, USA  
Topic Area: LANGUAGE: Other

**Poster A45 Comprehending events on the fly: inhibition and selection during language processing**

Yanina Prystauka<sup>1,2</sup>, Zachary Ekves<sup>1,2</sup>, Gerry Altmann<sup>1,2</sup>; <sup>1</sup>University of Connecticut, <sup>2</sup>The Connecticut Institute for the Brain and Cognitive Sciences  
Topic Area: LANGUAGE: Other

**Poster A46 Left temporal lesions affect inner speech monitoring in language production: an electroencephalography and neuropsychological study**

Stephanie Ries<sup>1,2</sup>, Alexa Cavalea<sup>1</sup>, Chase Tengberg<sup>1</sup>, Kathleen Y. Haaland<sup>3</sup>, Robert T. Knight<sup>4</sup>, Nina F. Dronkers<sup>5,6,7</sup>; <sup>1</sup>School of Speech, Language, and Hearing Sciences, San Diego State University, <sup>2</sup>Center for Clinical and Cognitive Neuroscience, San Diego State University, <sup>3</sup>Department of Psychiatry and Behavioral Sciences, and Department of Neurology,

University of New Mexico, Albuquerque, <sup>4</sup>Department of Psychology and Helen Wills Neuroscience Institute, University of California, Berkeley, California, <sup>5</sup>Center for Aphasia and Related Disorders, Veterans Affairs Northern California Health Care System, Martinez, California, <sup>6</sup>Department of Neurology, University of California, Davis, California, <sup>7</sup>Neurolinguistics Laboratory, National Research University Higher School of Economics, Moscow, Russian Federation

Topic Area: LANGUAGE: Other

**Poster A47 Violations of ASL Sentence Processing: Observed Changes in Neural Oscillations**

Tristan Schaefer<sup>1</sup>, Kristina Backer<sup>1</sup>, Michael Grosvald<sup>2</sup>, David P. Corina<sup>1</sup>; <sup>1</sup>Center for Mind and Brain, University of California, Davis, <sup>2</sup>Qatar University  
Topic Area: LANGUAGE: Other

**Poster A48 The left anterior temporal lobe is a bidirectional convergence region mediating the relation between names and semantic knowledge for unique entities**

Amy Belfi<sup>1</sup>, Brett Schneider<sup>2</sup>, Jonah Heskje<sup>3</sup>, Joel Bruss<sup>3</sup>, Daniel Tranel<sup>3</sup>; <sup>1</sup>Missouri University of Science & Technology, <sup>2</sup>University of Wisconsin-Madison, <sup>3</sup>University of Iowa  
Topic Area: LANGUAGE: Semantic

**Poster A49 From action to abstraction: The sensorimotor grounding of metaphor comprehension in Parkinson's disease.**

Stacey Humphries<sup>1</sup>, Nate Klooster<sup>1</sup>, Eileen Cardillo<sup>1</sup>, Anjan Chatterjee<sup>1</sup>; <sup>1</sup>University of Pennsylvania  
Topic Area: LANGUAGE: Semantic

**Poster A50 A Late Slow Frontal Positivity ERP reflects the resolution of contextual ambiguity during narrative discourse comprehension**

Patrick Ledwidge<sup>1</sup>, Adam Ramsey<sup>1</sup>, Jeremy Foust<sup>1</sup>; <sup>1</sup>Baldwin Wallace University  
Topic Area: LANGUAGE: Semantic

**Poster A51 Do faces affect foreign-accented speech comprehension in children? An ERP investigation**

Abigail Cosgrove<sup>1</sup>, Carla B. Fernandez<sup>1</sup>, Sarah Grey<sup>2</sup>, Janet G. van Hell<sup>1</sup>; <sup>1</sup>Pennsylvania State University, <sup>2</sup>Fordham University  
Topic Area: LANGUAGE: Semantic

**Poster A52 What's, uhh, coming next? Effects of speech disfluency on event-related potentials during sentence processing**

Meredith Brown<sup>1,2</sup>, Nathaniel Delaney-Busch<sup>2</sup>, Barbara Storch<sup>1</sup>, Edward Wlotko<sup>3</sup>, Gina Kuperberg<sup>1,2</sup>; <sup>1</sup>Massachusetts General Hospital, <sup>2</sup>Tufts University, <sup>3</sup>Moss Rehabilitation Research Institute  
Topic Area: LANGUAGE: Semantic

**Poster A53 The involvement of left inferior frontal and posterior superior temporal gyri in processing Chinese relative clauses**

Kun-Yu Xu<sup>1</sup>, Jeng-Ren Duann<sup>1</sup>, Denise Wu<sup>1</sup>; <sup>1</sup>National Central University  
Topic Area: LANGUAGE: Syntax

**Poster A54 Effects of age on across-participant variability of cortical reinstatement effects**

Preston Thakral<sup>1</sup>, Tracy Wang<sup>2</sup>, Michael Rugg<sup>3</sup>; <sup>1</sup>Harvard University, <sup>2</sup>University of Texas at Austin, <sup>3</sup>University of Texas at Dallas  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster A55 Memory and processing speed predict functional independence differentially in non-Hispanic and Hispanic White middle aged and older adults**

Ariana Stichel<sup>1</sup>, Andrew McKinnon<sup>1</sup>, John Ruiz<sup>1</sup>, Lee Ryan<sup>1</sup>; <sup>1</sup>University of Arizona

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster A56 Decreased hippocampal-prefrontal functional connectivity predicts episodic memory in Alzheimer's disease**

Eun Hyun Seo<sup>1</sup>, Jinsick Park<sup>2</sup>, Mina Heo<sup>3</sup>, IL Han Choo<sup>4</sup>; <sup>1</sup>Premedical science, College of Medicine, Chosun University, Gwangju, Korea, <sup>2</sup>Hanyang University, Seoul, Republic of Korea, <sup>3</sup>Center for Development of BioMedical Technology, Chosun University Hospital, Gwangju, Korea, <sup>4</sup>School of Medicine, Chosun University Hospital, Gwangju, Korea

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster A57 Multiple brain markers predict risk of progression on the Clinical Dementia Rating Scale in clinically normal older adults**

Taylor E. Neal<sup>1</sup>, Jenny S. Rabin<sup>1,2</sup>, Aaron P. Schultz<sup>1,2</sup>, Keith A. Johnson<sup>1,2,3</sup>, Reisa A. Sperling<sup>1,2,3</sup>, Trey Hedden<sup>1,2</sup>; <sup>1</sup>Massachusetts General Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Brigham and Women's Hospital

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster A58 The neurocognitive effects of digital memory augmentation**

Chris B. Martin<sup>1</sup>, Bryan Hong<sup>1</sup>, Andrew Xia<sup>1</sup>, Christopher J. Honey<sup>2</sup>, Morgan D. Barense<sup>1,3</sup>; <sup>1</sup>University of Toronto, <sup>2</sup>Johns Hopkins University, <sup>3</sup>Rotman Research Institute

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A59 Strategically orienting retrieval toward remote and recent memories: An episodic specificity account**

Emily Leiker<sup>1,2</sup>, Mason Price<sup>2</sup>, Jeffrey Johnson<sup>2</sup>; <sup>1</sup>Boys Town National Research Hospital, <sup>2</sup>University of Missouri

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A60 Memory Reactivation with Neurostimulation during Sleep Elicits Electrophysiological Responses that Predict Behavioral Changes**

Ryan J. Hubbard<sup>1</sup>, Nicholas A. Ketz<sup>1</sup>, Aaron P. Jones<sup>2</sup>, Bradley Robert<sup>2</sup>, Natalie B. Bryant<sup>2</sup>, Steven W. Skorheim<sup>1</sup>, Shane Roach<sup>1</sup>, Vincent P. Clark<sup>2</sup>, Praveen K. Pilly<sup>1</sup>; <sup>1</sup>Information and Systems Sciences Laboratory, HRL Laboratories, LLC, Malibu, CA, <sup>2</sup>The University of New Mexico, Albuquerque, NM

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A61 Theta oscillations during active and passive decision making for navigation**

Elizabeth Chrastil<sup>1,2</sup>, Mathias Goncalves<sup>1</sup>, Kylie Moore<sup>3</sup>, Chantal Stern<sup>1</sup>, Erika Nyhus<sup>3</sup>; <sup>1</sup>Boston University, <sup>2</sup>University of California, Santa Barbara, <sup>3</sup>Bowdoin College

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A62 Noninvasive stimulation increases fMRI connectivity during autobiographical memory retrieval more so than during rest**

Kristen Warren<sup>1</sup>, Molly S Hermiller<sup>1</sup>, Steven VanHaerents<sup>1</sup>, Joel L Voss<sup>1</sup>; <sup>1</sup>Northwestern University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A63 Differential effects of negative emotion on item-specific and contextual memory precision**

Rose Cooper<sup>1</sup>, Maureen Ritchey<sup>1</sup>; <sup>1</sup>Boston College

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A64 Visual free recall of real-world scenes reveals high capacity and exquisite detail in memory**

Wilma Bainbridge<sup>1</sup>, Elizabeth Hall<sup>1</sup>, Chris Baker<sup>1</sup>; <sup>1</sup>National Institute of Mental Health

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A65 Temporal Contiguity Deficits in Medial Temporal Lobe Amnesia**

Joseph Di Lascio<sup>1</sup>, Daniela Palombo<sup>1</sup>, Per Sederberg<sup>2</sup>, Marc Howard<sup>1</sup>, Mieke Verfaellie<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>Ohio State University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A66 A Synergistic Ecphory Account of Pupillary Old/New Effects During Episodic Memory Retrieval**

Mingjian He<sup>1</sup>, Elena Festa<sup>1</sup>, William Heindel<sup>1</sup>; <sup>1</sup>Brown University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A67 Reinstatement of spatial information in a hybrid spatial-episodic memory task**

Nora A Herweg<sup>1</sup>, Ashwini D Sharan<sup>2</sup>, Michael R Sperling<sup>2</sup>, Armin Brandt<sup>3</sup>, Andreas Schulze-Bonhage<sup>3</sup>, Michael J Kahana<sup>1</sup>; <sup>1</sup>University of Pennsylvania, <sup>2</sup>Thomas Jefferson University Hospital, <sup>3</sup>University Medical Center Freiburg

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A68 Resting-state hippocampal functional connectivity depends on handedness**

John Scofield<sup>1</sup>, Jeffrey Johnson<sup>1</sup>; <sup>1</sup>University of Missouri

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A69 Caudate Activation in Adolescents during Goal-Directed Memory Performance is Associated with Mood, Anxiety, and Sensation Seeking**

Emily Oot<sup>1,3</sup>, Jennifer Sneider<sup>1,2</sup>, Julia Cohen-Gilbert<sup>1,2</sup>, Derek Hamilton<sup>4</sup>, Anna Seraikas<sup>1</sup>, Maya Rieselbach<sup>1</sup>, Carolyn Caine<sup>1</sup>, Arkadiy Maksimovskiy<sup>1,2</sup>, Lisa Nickerson<sup>1,2</sup>, Sion Harris<sup>2,5</sup>, Marisa Silveri<sup>1,2</sup>; <sup>1</sup>McLean Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Boston University School of Medicine, <sup>4</sup>University of New Mexico, <sup>5</sup>Boston Children's Hospital

Topic Area: LONG-TERM MEMORY: Episodic

**Poster A70 Improving Memory with Real-Time Phase-Locked Reactivation during Sleep**

Laura Batterink<sup>1</sup>, Florczak Susan<sup>1</sup>, Santostasi Giovanni<sup>1</sup>, Zee Phyllis<sup>1</sup>, Sanchez Daniel<sup>2</sup>, Paller Ken<sup>1</sup>; <sup>1</sup>Northwestern University, <sup>2</sup>SRI International

Topic Area: LONG-TERM MEMORY: Other

**Poster A71 Impoverished Semantic Memory in Mild Cognitive Impairment**

Nathaniel Klooster<sup>1</sup>, Arun Pilia<sup>1</sup>, David A. Wolk<sup>1</sup>, Anjan Chatterjee<sup>1</sup>;  
<sup>1</sup>University of Pennsylvania

Topic Area: LONG-TERM MEMORY: Semantic

**Poster A72            Generalization in an object category learning paradigm is better in the morning than the evening**

Anna Schapiro<sup>1</sup>, Mollie Bayda<sup>1</sup>, Eileen Cho<sup>1</sup>, Roy Cox<sup>1</sup>, Robert Stickgold<sup>1</sup>;

<sup>1</sup>Harvard Medical School / Beth Israel Deaconess Medical Center

Topic Area: LONG-TERM MEMORY: Semantic

**Poster A73            Mechanisms Underlying Memory Distortion for Emotional Orthographic Associates with EEG**

Nicholas Griffin<sup>1</sup>, David Schnyer<sup>1</sup>; <sup>1</sup>The University of Texas at Austin

Topic Area: LONG-TERM MEMORY: Semantic

**Poster A74            Explicit probabilistic sequence learning in Tourette syndrome**

Eszter Tóth-Fáber<sup>1</sup>, Zsanett Tárnok<sup>2</sup>, Andrea Kóbor<sup>3</sup>, Karolina Janacsek<sup>1,4</sup>, Alexandra Rádosi<sup>1</sup>, Eszter Dóra Szabó<sup>1</sup>, Dóra Merkl<sup>2</sup>, Szabina Oláh<sup>2</sup>, Orsolya Hegedűs<sup>2</sup>, Péter Nagy<sup>2</sup>, Réka Vidomusz<sup>2</sup>, Dezsó Nemeth<sup>1,4</sup>; <sup>1</sup>Eötvös Loránd University, Budapest, Hungary, <sup>2</sup>Vadaskert Child Psychiatry Hospital, Budapest, Hungary, <sup>3</sup>Brain Imaging Centre, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary, <sup>4</sup>Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary

Topic Area: LONG-TERM MEMORY: Skill learning

**Poster A75            Having your cake and eating it too: Flexibility and power with mass univariate statistics for ERP data**

Eric C. Fields<sup>1,2</sup>, Gina R. Kuperberg<sup>3,4</sup>; <sup>1</sup>Boston College, <sup>2</sup>Brandeis University, <sup>3</sup>Tufts University, <sup>4</sup>Massachusetts General Hospital

Topic Area: METHODS: Electrophysiology

**Poster A76            Dissociating Alzheimer's Disease from Amnesic Mild Cognitive Impairment Using Time-frequency-based EEG Measures**

Wendel Friedl<sup>1</sup>, Paul Kieffaber<sup>1</sup>; <sup>1</sup>College of William and Mary

Topic Area: METHODS: Electrophysiology

**Poster A77            The Role of Inter-region Information Synchrony in Processing Visual Stimuli**

Heather Bruett<sup>1</sup>, Marc Coutanche<sup>1</sup>; <sup>1</sup>University of Pittsburgh

Topic Area: METHODS: Neuroimaging

**Poster A78            Objective Measure of Imagined Hand Manipulations: An EEG Study**

Christopher Donoff<sup>1</sup>, Christopher Madan<sup>1,2</sup>, Sarah Elke<sup>1</sup>, Anthony Singhal<sup>1</sup>;

<sup>1</sup>University of Alberta, <sup>2</sup>University of Nottingham

Topic Area: METHODS: Neuroimaging

**Poster A79            EEG-Based Source Imaging Revealed Lower Beta-Band Top-Down Modulation of Early Visual Areas**

Hua Zhong<sup>1</sup>, Guang Ouyang<sup>1</sup>, Yunqing Hua<sup>1</sup>, Akaysha Tang<sup>1</sup>; <sup>1</sup>The Laboratory of Neuroscience for Education, Faculty of Education, The University of Hong Kong

Topic Area: METHODS: Neuroimaging

**Poster A80            P300 and theta-band oscillation: two expressions of a single novelty response**

Xueyan Niu<sup>1</sup>, Guang Ouyang<sup>1</sup>, Yunqing Hua<sup>1</sup>, Akaysha Tang<sup>1</sup>; <sup>1</sup>The Laboratory of Neuroscience for Education, Faculty of Education, The University of Hong Kong

Topic Area: METHODS: Neuroimaging

**Poster A81            Novelty enhances the reliability and timing consistency of neuronal source response**

Guang Ouyang<sup>1</sup>, Yunqing Hua<sup>1</sup>, Changsong Zhou<sup>2</sup>, Akaysha Tang<sup>1</sup>;

<sup>1</sup>Laboratory of Neuroscience for Education, Faculty of Education, The University of Hong Kong, <sup>2</sup>Department of Physics, Institute of Computational and Theoretical Studies, Hong Kong Baptist University

Topic Area: METHODS: Neuroimaging

**Poster A82            Measuring Prefrontal Functional Connectivity Development in Preschool-aged Children Using fNIRS**

Jaeah Kim<sup>1</sup>, Alexander Rüschi<sup>1</sup>, Jana M. Kainerstorfer<sup>1</sup>, Erik D. Thiessen<sup>1</sup>, Anna V. Fisher<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

Topic Area: METHODS: Other

**Poster A83            Characterizing inter-individual differences in brain morphology**

Christopher R. Madan<sup>1,2</sup>; <sup>1</sup>University of Nottingham, <sup>2</sup>Boston College

Topic Area: NEUROANATOMY

**Poster A84            Organized patterns of cortical thinning observed across the healthy adult lifespan.**

Phillip Agres<sup>1</sup>, Micaela Chan<sup>1</sup>, Liang Han<sup>1</sup>, Neil Savalia<sup>1</sup>, Gagan Wig<sup>1,2</sup>;

<sup>1</sup>Center for Vital Longevity and School of Behavioral and Brain Sciences, University of Texas at Dallas, Dallas, TX, 75235, USA, <sup>2</sup>Department of Psychiatry, University of Texas Southwestern Medical Center, Dallas, TX, 75390, USA

Topic Area: NEUROANATOMY

**Poster A85            Insular Functionally Connected Sub-regions of Healthy Developing Youth**

Aliyah Jones<sup>1</sup>, Yu-Ping Wang<sup>2</sup>, Jeremy D. Cohen<sup>1</sup>; <sup>1</sup>Xavier University of Louisiana, <sup>2</sup>Tulane University

Topic Area: NEUROANATOMY

**Poster A86            Collective listening: Effects of groove, tempo, and visual coupling among audience members on physical engagement with the music**

Laurel Trainor<sup>1,2</sup>, Dobromir Dotov<sup>1</sup>, Daniel Bosnyak<sup>1</sup>; <sup>1</sup>McMaster University, <sup>2</sup>Rotman Research Institute

Topic Area: PERCEPTION & ACTION: Audition

**Poster A87            Stochastic resonance like cross-modal enhancement as a universal neural computation and cognitive processing principle**

Patrick Krauss<sup>1</sup>, Achim Schilling<sup>1</sup>, Konstantin Tziridis<sup>1</sup>, Holger Schulze<sup>1</sup>; <sup>1</sup>University of Erlangen-Nuremberg

Topic Area: PERCEPTION & ACTION: Audition

**Poster A88            FOXP2 Variation Modulates Auditory Feedback Control of Speech Production**

Siyun Zhang<sup>1</sup>, Hanjun Liu<sup>1</sup>; <sup>1</sup>The First Affiliated Hospital, Sun Yat-sen University

Topic Area: PERCEPTION & ACTION: Audition

**Poster A89**      **Age effects on ventral visual pathway representations: Evidence for dedifferentiation and hyperdifferentiation**

Zachary Monge<sup>1</sup>, Erik Wing<sup>1</sup>, Benjamin Geib<sup>1</sup>, Lifu Deng<sup>1</sup>, Simon Davis<sup>1</sup>, Ziwei Zhang<sup>1</sup>, Roberto Cabeza<sup>1</sup>; <sup>1</sup>Duke University  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster A90**      **Short Form of the California Odor Learning Test**

Conner Frank<sup>1</sup>, Jingwen Liu<sup>1</sup>, Claire Murphy<sup>1,2</sup>; <sup>1</sup>San Diego State University, <sup>2</sup>University of California San Diego  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster A91**      **Intentionality modulates the impact of reward and punishment on performance during sequence learning**

Adam Steel<sup>1,2</sup>, Chris Baker<sup>1</sup>, Charlotte Stagg<sup>2</sup>; <sup>1</sup>Laboratory of Brain and Cognition, National Institute of Mental Health, National Institute of Health, Bethesda, MD 20016, <sup>2</sup>Wellcome Centre for Integrative Neuroimaging, FMRIB Centre, John Radcliffe Hospital, University of Oxford, Oxford, OX3 9DU, United Kingdom  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster A92**      **Effects of sharing goals with others on sense of agency and motor performance**

Kazuki Hayashida<sup>1</sup>, Yuki Nishi<sup>1</sup>, Michihiro Osumi<sup>1</sup>, Shu Morioka<sup>1</sup>; <sup>1</sup>Kio university  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster A93**      **Sense of agency and motor performance are stronger when an individual is capable of motor prediction**

Shu Morioka<sup>1</sup>, Kazuki Hayashida<sup>1</sup>, Akihiro Masuike<sup>1</sup>, Yuki Nishi<sup>1</sup>, Michihiro Osumi<sup>1</sup>, Satoshi Nobusako<sup>1</sup>; <sup>1</sup>Kio University  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster A94**      **Role of Facial Expression Conflict in Motor Inhibition**

Cheng-I Lam<sup>1</sup>, Trung Nguyen<sup>1</sup>, Che-Yi Hsu<sup>1</sup>, Chi-Hung Juan<sup>1</sup>; <sup>1</sup>Institute of Cognitive Neuroscience, National Central University, No.300, Zhongda Road., Zhongli county, Taoyuan City - 32001, Taiwan  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster A95**      **Neuroanatomical differences between monozygotic twins discordant for musical practice**

Örjan de Manzano<sup>1</sup>, Fredrik Ullén<sup>1</sup>; <sup>1</sup>Karolinska Institutet  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster A96**      **Where's my foot? The disappearing 'foot' trick in healthy individuals and individuals with Body Integrity Identity Disorder**

Kayla D. Stone<sup>1</sup>, Femke Bullock<sup>1</sup>, Anouk Keizer<sup>1</sup>, Rianne Blom<sup>2</sup>, Manja Engel<sup>1</sup>, H. Chris Dijkerman<sup>1</sup>; <sup>1</sup>Utrecht University, <sup>2</sup>University of Amsterdam  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster A97**      **Reading and neuropsychological performance: Relationships in patients with mild-to-moderate TBI**

Keith Main<sup>1</sup>, Salil Soman<sup>2</sup>, Emma Gregory<sup>1</sup>, Maxwell Rappoport<sup>3</sup>, Micaela Thordarson<sup>3</sup>, Jennifer Kong<sup>3</sup>, J. Wesson Ashford<sup>3,4</sup>, Stephanie Kolakowsky-Hayner<sup>5</sup>, Maheen Adamson<sup>1</sup>; <sup>1</sup>Defense and Veterans Brain Injury Center, <sup>2</sup>Harvard Medical School, <sup>3</sup>War Related Illness and Injury Study Center, <sup>4</sup>Stanford School of Medicine, <sup>5</sup>Santa Clara Valley Medical Center  
Topic Area: PERCEPTION & ACTION: Other

**Poster A98**      **The effect of writing style on mu rhythm while appreciating Chinese calligraphy**

Shwu-Lih Huang<sup>1</sup>, Wei-Li Tu<sup>1</sup>, Guang-Yi Lai<sup>1</sup>; <sup>1</sup>National Chengchi University  
Topic Area: PERCEPTION & ACTION: Other

**Poster A99**      **Neural correlates of the emergence, stabilization and evaluation of conscious visual percepts**

Marine Vernet<sup>1</sup>, Shruti Japee<sup>1</sup>, Valentinos Zachariou<sup>1</sup>, Sara Ahmed<sup>1</sup>, Savannah Lokey<sup>1</sup>, Leslie Ungerleider<sup>1</sup>; <sup>1</sup>Section on Neurocircuitry, Laboratory of Brain and Cognition, NIMH/NIH, Bethesda, MD, USA  
Topic Area: PERCEPTION & ACTION: Vision

**Poster A100**      **Neural correlates of consciousness in the medial temporal lobe: an intracranial EEG study of attentional blink.**

Saturday, March 24, 1:30–3:30 pm, Exhibit Hall C

Jim Herring<sup>1,2</sup>, Thomas Reber<sup>3</sup>, Florian Mormann<sup>3</sup>, Heleen Slagter<sup>1,2</sup>; <sup>1</sup>Department of Psychology, University of Amsterdam, The Netherlands, <sup>2</sup>Amsterdam Brain and Cognition, University of Amsterdam, The Netherlands, <sup>3</sup>Department of Epileptology, University of Bonn Medical Center, Bonn, Germany  
Topic Area: PERCEPTION & ACTION: Vision

**Poster A101**      **Parieto-frontal regions and alpha power involved in postdiction**

Laetitia Grabot<sup>1</sup>, Virginie van Wassenhove<sup>1</sup>; <sup>1</sup>CEA, NeuroSpin, Cognitive Neuroimaging Unit  
Topic Area: PERCEPTION & ACTION: Vision

**Poster A102**      **Psychological dimensions and their neural correlates in response to architectural interiors**

Alex Coburn<sup>1</sup>, Oshin Vartanian<sup>2</sup>, Marcos Nadal<sup>3</sup>, Yoed Kenett<sup>1</sup>, Anjan Chatterjee<sup>1</sup>; <sup>1</sup>University of Pennsylvania, <sup>2</sup>University of Toronto, <sup>3</sup>University of Vienna  
Topic Area: PERCEPTION & ACTION: Vision

**Poster A103**      **To trust, or not to trust? Individual differences in psychophysiological reactivity predict trust under acute stress**

Stephanie Potts<sup>1,2</sup>, William T. McCuddy<sup>1</sup>, Devi Jayan<sup>1</sup>, Anthony J. Porcelli<sup>1,3</sup>; <sup>1</sup>Marquette University, <sup>2</sup>Veterans Administration, St. Louis Health Care System, <sup>3</sup>Clinical & Translational Science Institute of Southeast Wisconsin  
Topic Area: THINKING: Decision making

**Poster A104**      **Anterior insula-nucleus accumbens connectivity in PTSD: clinical and decision-making correlates**

Elizabeth Olson<sup>1,2</sup>, Gwenievere Birster<sup>1</sup>, Scott Rauch<sup>1,2</sup>, Isabelle Rosso<sup>1,2</sup>; <sup>1</sup>McLean Hospital, <sup>2</sup>Harvard Medical School  
Topic Area: THINKING: Decision making

**Poster A105**      **Information integration and endogenous control during exploration and exploitation**

Nathan Tardiff<sup>1</sup>, Sharon L Thompson-Schill<sup>1</sup>; <sup>1</sup>University of Pennsylvania  
Topic Area: THINKING: Decision making

**Poster A106**      **Dissecting the neural correlates of ambidextrous decision making**

Ting-Ting Chang<sup>1</sup>, Carol Yeh-Yun Lin<sup>1</sup>, Nai-Shing Yen<sup>1</sup>, Danchi Tan<sup>1</sup>, Ying-Ching Chen<sup>1</sup>; <sup>1</sup>National Chengchi University  
Topic Area: THINKING: Decision making

**Poster A107 Effects of video games on reward-processing; an fMRI study**

David Raymond<sup>1</sup>, Kelsey Prena<sup>1</sup>, Josh Brown<sup>1</sup>, Sharlene D. Newman<sup>1</sup>;  
<sup>1</sup>Indiana University Bloomington  
Topic Area: THINKING: Decision making

**Poster A108 Age-related differences in frontoparietal activity underlying creativity for convergent and divergent thinking**

Helena H. Lee<sup>1</sup>, Ko-Jou Liu<sup>1</sup>, Ya-Wen Fang<sup>1,2</sup>, De-Jung Tseng<sup>1</sup>, Ching-Po Lin<sup>3</sup>, Ovid J.L. Tzeng<sup>1,2,4,5,6</sup>, Hsu-Wen Huang<sup>2,6</sup>, Chih-Mao Huang<sup>1,2</sup>;  
<sup>1</sup>National Chiao Tung University, <sup>2</sup>Academia Sinica, <sup>3</sup>National Yang Ming University, <sup>4</sup>Taipei Medical University, <sup>5</sup>National Taiwan Normal University, <sup>6</sup>City University of Hong Kong  
Topic Area: THINKING: Development & aging

**Poster A109 The role of sleep in memory and problem solving**

Kristin Grunewald<sup>1</sup>, Ken A. Paller<sup>1</sup>, Mark Beeman<sup>1</sup>; <sup>1</sup>Northwestern University  
Topic Area: THINKING: Problem solving

**Poster A111 Brain processes supporting the generation of new and original ideas**

Mathias Benedek<sup>1</sup>, Emanuel Jauk<sup>1</sup>, Roger Beaty<sup>2</sup>; <sup>1</sup>University of Graz, <sup>2</sup>Harvard University  
Topic Area: LONG-TERM MEMORY: Semantic

**Poster A112 The Effect of Degree of Handedness and Gender Differences on White Matter**

Jordan Begay<sup>1</sup>, Hu Cheng Ph. D.<sup>1</sup>, Sharlene Newman Ph.D.<sup>1</sup>; <sup>1</sup>Indiana University of Bloomington  
Topic Area: NEUROANATOMY

**Poster A113 Auditory scene analysis in adolescents with and without language disorders: Neural indicators of maturation and auditory memory**

Elyse Sussman<sup>1</sup>; <sup>1</sup>Albert Einstein College of Medicine

Topic Area: ATTENTION: Auditory

**Poster A114 Interactions between Age and Sex in Rhythmic Attention Networks**

Alex Wiesman<sup>1</sup>, Tony W Wilson<sup>1</sup>; <sup>1</sup>University of Nebraska Medical Center  
Topic Area: ATTENTION: Development & aging

**Poster A115 Seen and heard emotions of a crowd alter perception and state affect**

Sarah C. Izen<sup>1</sup>, Xenia Levayah<sup>1</sup>, Vivian M. Ciaramitaro<sup>1</sup>; <sup>1</sup>University of Massachusetts Boston  
Topic Area: ATTENTION: Multisensory

**Poster A116 Investigating the relation between cognitive performance and brain activity associated with concentration in patients with a brain tumor**

Miek de Dreu<sup>1</sup>, Irena Schouwenaars<sup>1</sup>, Geert-Jan Rutten<sup>1</sup>, Nick Ramsey<sup>2</sup>, Martijn Jansma<sup>1</sup>; <sup>1</sup>Clinical Imaging Tilburg, Department of Neurosurgery, Elisabeth-TweeStedenHospital, Tilburg, The Netherlands, <sup>2</sup>Brain Center

RudolfMagnus, Department of Neurology and Neurosurgery, UMC Utrecht, Utrecht, The Netherlands

Topic Area: ATTENTION: Nonspatial

**Poster A117 Systematic non-stationarity of alpha rhythms in the human brain: Long term frequency sliding and power changes**

Christian Keitel<sup>1</sup>, Christopher SY Benwell<sup>1</sup>, Joachim Gross<sup>1</sup>, Gregor Thut<sup>1</sup>;  
<sup>1</sup>University of Glasgow  
Topic Area: ATTENTION: Other

**Poster A118 Impaired sustained attention ability is associated with metabolic syndrome**

Thomas Wooten<sup>1,2</sup>, Michael Esterman<sup>2,3</sup>, Joe DeGutis<sup>1,2</sup>, Victoria Poole<sup>1,2</sup>, Elizabeth Leritz<sup>1,2</sup>; <sup>1</sup>Harvard Medical School, <sup>2</sup>VA Boston Healthcare System, <sup>3</sup>Boston University School of Medicine  
Topic Area: ATTENTION: Other

**Poster A119 Visual Field Representations in Human Cerebellum**

James A. Brissenden<sup>1</sup>, Sean M. Tobyne<sup>1</sup>, David E. Osher<sup>2</sup>, Emily J. Levin<sup>3</sup>, Mark A. Halko<sup>4</sup>, David C. Somers<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>Ohio State University, <sup>3</sup>Brown University, <sup>4</sup>Harvard Medical School and Beth Israel Deaconess Medical Center  
Topic Area: ATTENTION: Spatial

**Poster A120 Separate Components of Attentional Bias to Reward Relate to Individual Differences in Impulsivity**

Kristin Meyer<sup>1</sup>, Nelly Topa<sup>1</sup>, Cheyenne Bricken<sup>1</sup>, Margaret Sheridan<sup>1</sup>, Joe Hopfinger<sup>1</sup>; <sup>1</sup>University of North Carolina at Chapel Hill  
Topic Area: ATTENTION: Spatial

**Poster A121 Socioeconomic status moderates age-related differences in brain anatomy and functional network organization across the adult lifespan**

Micaela Chan<sup>1</sup>, Jinkyung Na<sup>2</sup>, Phillip Agres<sup>1</sup>, Neil Savalia<sup>1</sup>, Denise Park<sup>1,3</sup>, Gagan Wig<sup>1,3</sup>; <sup>1</sup>University of Texas at Dallas, <sup>2</sup>Sogang University, <sup>3</sup>University of Texas Southwestern Medical Center  
Topic Area: EMOTION & SOCIAL: Development & aging

**Poster A122 Age-related Differences in Selective Attention to Emotional Material: Does Task Relevance Matter?**

Didem Pehlivanoglu<sup>1</sup>, Paul Verhaeghen<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology  
Topic Area: EMOTION & SOCIAL: Development & aging

**Poster A123 Upregulating Empathy: An EEG Study in Undergraduates with Psychopathic Traits**

Danielle diFilipo<sup>1,2</sup>, Alexandra Bueno<sup>2</sup>, Lissette Gimenez-Arce<sup>2</sup>, Kayla Talbot<sup>2</sup>, Taylor Valentin<sup>2</sup>, Denice Vidals<sup>2</sup>, Jill Grose-Fifer<sup>1,2</sup>; <sup>1</sup>The Graduate Center - CUNY, <sup>2</sup>John Jay College of Criminal Justice - CUNY  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A124 Orbitofrontal cortex integrates amygdala-hippocampal information and guides schema-based emotional categorization**

Jie Zheng<sup>1</sup>, Jack J. Lin<sup>1,2</sup>; <sup>1</sup>University of California, Irvine, <sup>2</sup>Comprehensive Epilepsy Program, Irvine, CA  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A125 Genetic Contributions to Implicit Racial Bias: Does Race Matter?**

Brianna Pankey<sup>1</sup>, Bethany C. Reeb-Sutherland<sup>1</sup>, Melanie Stollstorff<sup>1</sup>; <sup>1</sup>Florida International University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A126 Accessing General World Knowledge in Language Comprehension: The Case of Emotion**

Dorothee J. Chwilla<sup>1</sup>; <sup>1</sup>Donders Institute for Brain, Cognition, and Behaviour, Radboud University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A127 Montessori Education Fosters Less Focal but Unwavering Attention After Errors: Hasty Slowly To Think Creatively.**

Solange Denervaud<sup>1</sup>, Edouard Gentaz<sup>1,2</sup>; <sup>1</sup>The Swiss Center for Affective Sciences (CISA), University of Geneva, Switzerland, <sup>2</sup>Faculty of Psychology and Educational Sciences (FAPSE), University of Geneva, Switzerland

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A128 Translating cognitive neuroscience findings to benefits outside the lab: Promoting resilience in student veterans through a novel cognitive-emotional intervention**

Yifan Hu<sup>1</sup>, Christian Williams<sup>1</sup>, Howard Berenbaum<sup>1</sup>, Florin Dolcos<sup>1</sup>, Sanda Dolcos<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster A129 Gender Differences in Engaging with Negative Stimuli during Emotion Regulation and Processing Tasks related to Personality/Affective Style**

Teodora Stoica<sup>1</sup>, Lindsay Knight<sup>1</sup>, Naaz Farah<sup>1</sup>, Depue Brendan<sup>1</sup>; <sup>1</sup>University of Louisville

Topic Area: EMOTION & SOCIAL: Emotional responding

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## Poster Session B

Sunday, March 25, 8:00-10:00 am

**Poster B1 Impact of talker adaptation on speech processing and working memory**

Sung-Joo Lim<sup>1</sup>, Jessica Tin<sup>1</sup>, Barbara Shinn-Cunningham<sup>1</sup>, Tyler Perrachione<sup>1</sup>; <sup>1</sup>Boston University

Topic Area: ATTENTION: Auditory

**Poster B2 Age and sex modulate the variability of neural responses to engaging videos**

Samantha Cohen<sup>1,2</sup>, Agustin Petroni<sup>1</sup>, Nicolas Langer<sup>1,3</sup>, Simon Henin<sup>1</sup>, Tamara Vanderwal<sup>5</sup>, Michael P. Milham<sup>3,6</sup>, Lucas C. Parra<sup>1</sup>; <sup>1</sup>The City College of New York, <sup>2</sup>The Graduate Center of the City University of New York, <sup>3</sup>Child Mind Institute, <sup>4</sup>University of Zurich, <sup>5</sup>Yale Child Study Center, <sup>6</sup>Nathan Kline Institute for Psychiatric Research

Topic Area: ATTENTION: Development & aging

**Poster B3 Cross-modal activation of visual cortices depends on auditory selective attention**

Chrysa Retsa<sup>1</sup>, Pawel J. Matusz<sup>1</sup>, Jan Schnupp<sup>1,2</sup>, Micah Murray<sup>1,3,4,5</sup>; <sup>1</sup>The Laboratory for Investigative Neurophysiology (The LINE), University Hospital Center and University of Lausanne, Lausanne, Switzerland, <sup>2</sup>Biomedical

Sciences, City University of Hong Kong, Kowloon, Hong Kong SAR, <sup>3</sup>EEG Brain Mapping Core, Center for Biomedical Imaging (CIBM) of Lausanne and Geneva, Switzerland, <sup>4</sup>Vanderbilt University, Nashville, TN, USA, <sup>5</sup>University of Lausanne, Jules-Gonin Eye Hospital, Lausanne, Switzerland

Topic Area: ATTENTION: Multisensory

**Poster B4 To what extent do spatial attention and expectation rely on 'amodal' or modality-specific mechanisms?**

Arianna Zuanazzi<sup>1</sup>, Uta Noppeney<sup>1</sup>; <sup>1</sup>Computational Neuroscience and Cognitive Robotics Centre, University of Birmingham, UK

Topic Area: ATTENTION: Multisensory

**Poster B5 Attention and self-reported ADHD tendency modulate very early electrophysiological responses for visual words**

Tetsuko Kasai<sup>1</sup>, Aiko Tanaka<sup>2</sup>, Yasuko Okumura<sup>3</sup>, Tomoki Uno<sup>2</sup>; <sup>1</sup>Faculty of Education, Hokkaido University, <sup>2</sup>Graduate School of Education, Hokkaido University, <sup>3</sup>National Center of Neurology and Psychiatry

Topic Area: ATTENTION: Nonspatial

**Poster B6 In Search of Mind Wandering: Dynamic Functional Connectivity during Rest and Task**

Ekaterina Denkova<sup>1</sup>, Jason S. Nomi<sup>1</sup>, Shruti Gopal Vij<sup>1</sup>, Lucina Q. Uddin<sup>1</sup>, Amishi P. Jha<sup>1</sup>; <sup>1</sup>University of Miami

Topic Area: ATTENTION: Other

**Poster B7 Dynamic Fluctuations in Sustained Attention: Relating Neural Fluctuations to Individual Performance**

Francesca Fortenbaugh<sup>1,2</sup>, David Rothlein<sup>1,3</sup>, Joseph DeGutis<sup>1,2</sup>, Regina McGlinchey<sup>1,2</sup>, Michael Esterman<sup>1,3</sup>; <sup>1</sup>Department of Veterans Affairs, Boston Healthcare System, <sup>2</sup>Harvard Medical School, <sup>3</sup>Boston University School of Medicine

Topic Area: ATTENTION: Other

**Poster B8 Dissociations Between Explicit Number Forms and Implicit SNARC Effects in Number-Form Synesthetes**

Elizabeth Y. Toomarian<sup>1</sup>, Radhika S. Gosavi<sup>1</sup>, Edward M. Hubbard<sup>1</sup>;

<sup>1</sup>University of Wisconsin-Madison

Topic Area: ATTENTION: Spatial

**Poster B9 The functional architecture of endogenous and exogenous attention: a dynamic causal modeling study**

Jake Bowling<sup>1</sup>, Kristin N. Meyer<sup>1</sup>, Joseph B. Hopfinger<sup>1</sup>; <sup>1</sup>University of North Carolina at Chapel Hill

Topic Area: ATTENTION: Spatial

**Poster B10 Aging Impairs Disengagement from Negative Words in a Dot Probe Task**

Christine E. Talbot<sup>1</sup>, John C. Ksander<sup>1</sup>, Angela Gutchess<sup>1</sup>; <sup>1</sup>Brandeis University

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster B11 Developmental Trajectories of Functional Connectivity in Autism from Childhood to Adolescents during Face Processing**

Fahimeh Mamashli<sup>1,2</sup>, Sheraz Khan<sup>1,2,3</sup>, Hari Bharadwaj<sup>1,2,3</sup>, Ainsley Losh<sup>1</sup>, Matti Hamalainen<sup>2,3,4</sup>, Tal Kenet<sup>1,2</sup>; <sup>1</sup>Department of Neurology, MGH, Harvard



Medical School, Boston, MA, USA, <sup>2</sup>Athinoula A. Martinos Center for Biomedical Imaging, MGH/HST, Charlestown, MA, USA, <sup>3</sup>Department of Radiology, MGH, Harvard Medical School, Boston, MA, USA, <sup>4</sup>Department of Neuroscience and Biomedical Engineering, Aalto University School of Science, Espoo, Finland

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster B12 Brain mechanisms by which emotional learning selectively and retroactively enhances memory for related information**

David Clewett<sup>1</sup>, Darren Yi<sup>1</sup>, Joseph Dunsmoor<sup>2</sup>, Elizabeth Phelps<sup>1</sup>, Lila Davachi<sup>1</sup>; <sup>1</sup>New York University, <sup>2</sup>The University of Texas at Austin

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster B13 Integration of spatio-temporal dynamics in emotion-cognition interactions: A simultaneous fMRI-ERP investigation using the emotional odd-ball task**

Matthew Moore<sup>1</sup>, Andrea Shafer<sup>2</sup>, Reyhaneh Bakhtiari<sup>3</sup>, Florin Dolcos<sup>1</sup>, Anthony Singhal<sup>3</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign, <sup>2</sup>National Institute on Aging, <sup>3</sup>University of Alberta

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster B14 Measuring Empathic Influences on Perceptual and Motor Processing with ERPs, EEG Oscillations, and Response Force**

Sarah Fabi<sup>1</sup>, Hartmut Leuthold<sup>1</sup>; <sup>1</sup>University of Tübingen, Germany

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster B15 Rewarded extinction diminishes enhancement of episodic fear memory**

Nicole Keller<sup>1</sup>, Joseph Dunsmoor<sup>1</sup>; <sup>1</sup>University of Texas at Austin

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster B16 Temporal dissociation in how stress enhances subjective valuation in the presence versus absence of explicit temptation**

Nidhi Banavar<sup>1</sup>, Candace Raio<sup>1</sup>, Anna Konova<sup>1</sup>, Paul Glimcher<sup>1</sup>; <sup>1</sup>New York University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster B17 Generalization of Conditioned Appetitive Responses in Humans**

Marta Andreatta<sup>1</sup>, Paul Pauli<sup>1</sup>; <sup>1</sup>Department of Psychology, University of Wuerzburg

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster B18 ERP probe technique without probe stimulus: Heartbeat-evoked potentials reflect physical attractiveness**

Kohei Fuseda<sup>1</sup>, Jun'ichi Katayama<sup>1</sup>; <sup>1</sup>Department of Psychological Science, Kwansei Gakuin University

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster B19 Frontal alpha asymmetry and heart rate synchronized during emotional experience when people show facial expression**

Motoyuki Sanada<sup>1</sup>, Masanori Kobayashi<sup>1</sup>, Keiko Otake<sup>1</sup>, Jun'ichi Katayama<sup>1</sup>; <sup>1</sup>Kwansei Gakuin University

Topic Area: EMOTION & SOCIAL: Other

**Poster B20 Increased response to facial attractiveness in visual areas reflects saliency, not reward**

Franziska Hartung<sup>1</sup>, Anja Jamrozik, Geoffrey Aguerri<sup>1</sup>, Miriam Esther Rosen<sup>1</sup>, David B. Sarwer<sup>2</sup>, Anjan Chatterjee<sup>1</sup>; <sup>1</sup>University of Pennsylvania, <sup>2</sup>Temple University

Topic Area: EMOTION & SOCIAL: Person perception

**Poster B21 EEG Responses to Unexpected Outcomes of Own or Partner's Actions in a Turn-Taking Game**

Gedeon Deák<sup>1</sup>, Kevin Jensen<sup>1</sup>, Alvin Li<sup>1</sup>, Scott Makeig<sup>1</sup>; <sup>1</sup>University of California, San Diego

Topic Area: EMOTION & SOCIAL: Person perception

**Poster B22 Exploring the effects of speed of processing training on brain activity and connectivity**

Christina Webb<sup>1</sup>, Christine Whitaker<sup>2</sup>, Jarrod Hicks<sup>2</sup>, Erica Schmidt<sup>2</sup>, Shaadee Samimy<sup>1</sup>, Nancy Dennis<sup>1</sup>, Kristina Visscher<sup>2</sup>, Lesley Ross<sup>1</sup>; <sup>1</sup>The Pennsylvania State University, <sup>2</sup>The University of Alabama at Birmingham

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B23 Functional segregation loss over time is moderated by APOE genotype in healthy elderly**

Eric Kwun Kei Ng<sup>1</sup>, Yingwei Qiu<sup>1,2</sup>, June C Lo<sup>1</sup>, Evelyn SC Koay<sup>3,4</sup>, Woon-Puay Koh<sup>1,5</sup>, Michael WL Chee<sup>1</sup>, Juan Zhou<sup>1,6</sup>; <sup>1</sup>Duke-NUS Medical School Singapore, <sup>2</sup>Third Affiliated Hospital of Guangzhou Medical University, China, <sup>3</sup>Yong Loo Lin School of Medicine, National University of Singapore, <sup>4</sup>National University Hospital Singapore, <sup>5</sup>Saw Swee Hock School of Public Health, National University of Singapore, <sup>6</sup>Clinical Imaging Research Centre, A\*Star-NUS

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B24 Aging effects on the neural connectivity underlying the arithmetic confusion effects.**

Thomas Hinault<sup>1</sup>, Kevin Larcher<sup>2</sup>, Louis Bherer<sup>3</sup>, Alain Dagher<sup>4</sup>, Susan Courtney<sup>5</sup>; <sup>1</sup>Johns Hopkins University, <sup>2</sup>McGill University, <sup>3</sup>Montreal Geriatric Institute, <sup>4</sup>McGill University, <sup>5</sup>Johns Hopkins University

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B25 The impact of deprivation and threatening experiences on behavior in early childhood**

Laura Machlin<sup>1</sup>, Adam B. Miller<sup>1</sup>, Jenna Snyder<sup>2</sup>, Katie A. McLaughlin<sup>3</sup>, Margaret A. Sheridan<sup>1</sup>; <sup>1</sup>University of North Carolina at Chapel Hill, <sup>2</sup>Cooper Medical School, <sup>3</sup>University of Washington

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B26 Dissociating Proactive and Reactive Control in Adolescents and Young Adults with Autism Spectrum Disorder**

Marie K. Krug<sup>1</sup>, Jeremy Hogeveen<sup>1</sup>, Cory C. Coleman<sup>1</sup>, Matthew V. Elliott<sup>1</sup>, Seoyoung Gam<sup>1</sup>, Cameron S. Carter<sup>1</sup>, Marjorie Solomon<sup>1</sup>; <sup>1</sup>University of California, Davis

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster B27 Creating Structured Task-sets from Categorical Stimuli**

Christina Bejjani<sup>1</sup>, Tobias Egner<sup>1</sup>; <sup>1</sup>Duke University

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster B28 Understanding the Effect of Media Multitasking on the Mind**

Jesus J. Lopez<sup>1</sup>, Madison M. Liggett<sup>1</sup>, Joseph M. Orr<sup>1</sup>; <sup>1</sup>Texas A&M University

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster B29            Enhancement of action inhibition by accidental rewards preceding the stop signals**

Hsin-Ju Lee<sup>1</sup>, Fa-Hsuan Lin<sup>2</sup>, Wen-Jui Kuo<sup>1</sup>; <sup>1</sup>National Yang-Ming University, <sup>2</sup>National Taiwan University

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster B30            Cycling as an effective modality for improving inhibitory control and maintaining brain function and academic performance in 9- to 10-year-old children**

Caroline C. Meadows<sup>1</sup>, Charles H. Hillman<sup>2</sup>, Eric S. Drollette<sup>1</sup>; <sup>1</sup>University of North Carolina at Greensboro, <sup>2</sup>Northeastern University

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster B31            Body Mass Correlates Inversely with Inhibitory Control in Go/NoGo Task: an ERP Study**

Siqi Chen<sup>1</sup>, Yajun Jia<sup>1</sup>, Steven Woltering<sup>1</sup>, Diana Guerra<sup>1</sup>, Johanna Song<sup>1</sup>; <sup>1</sup>Texas A&M University

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster B32            Computational modeling as a tool for detecting medication response in ADHD**

Mads Pedersen<sup>1,2</sup>, Michael J. Frank<sup>1</sup>, Sigurd Ziegler<sup>2</sup>, Mats Fredriksen<sup>3</sup>, Guido Biele<sup>4</sup>; <sup>1</sup>Brown University, <sup>2</sup>University of Oslo, <sup>3</sup>Vestfold Hospital Trust, <sup>4</sup>Norwegian Institute of Public Health

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster B33            Feedback-related ERPs during value-learning foreshadow how participants later handle reversal learning**

Sucheta Chakravarty<sup>1</sup>, Isha Ober<sup>1</sup>, Christopher R. Madan<sup>2</sup>, Yvonne Y. Chen<sup>3</sup>, Jeremy B. Caplan<sup>1</sup>; <sup>1</sup>University of Alberta, <sup>2</sup>University of Nottingham, <sup>3</sup>Baylor College of Medicine

Topic Area: EXECUTIVE PROCESSES: Other

**Poster B34            ERP Components Related to Proactive Interference in Visual Working Memory**

Li Zhou<sup>1</sup>, Thomas Farnbacher<sup>2</sup>, Robin Thomas<sup>2</sup>; <sup>1</sup>Bemidji State University, <sup>2</sup>Miami University

Topic Area: EXECUTIVE PROCESSES: Other

**Poster B35            Vascular Risk Factors for Diabetes in Late Adolescents and Young Adults, an Assessment of Working Memory**

Alexandra Roach<sup>1</sup>, Heather Nall<sup>1</sup>, Juliette Seremak<sup>1</sup>; <sup>1</sup>University of South Carolina Aiken

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster B36            Neural mechanisms of precision in visual working memory**

Elizabeth Lorenz<sup>1</sup>, Mark D'Esposito<sup>1</sup>; <sup>1</sup>University of California, Berkeley

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster B37            Reduced interference in working memory following mindfulness training is associated with increases in hippocampal volume**

Jonathan Greenberg<sup>1,2</sup>, Victoria L. Romero<sup>3</sup>, Seth Elkin-Frankston<sup>3</sup>, Matthew A. Bezddek<sup>4</sup>, Eric H. Schumacher<sup>4</sup>, Sara W. Lazar<sup>1,2</sup>; <sup>1</sup>Department of Psychiatry, Massachusetts General Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Charles River Analytics, <sup>4</sup>Georgia Institute of Technology

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster B38            Distinct influence of value-driven attentional capture when maintaining locations and spatial relations in working memory: An EEG study**

Myranda Gormley<sup>1</sup>, Thomas Hinault<sup>1</sup>, Kara J. Blacker<sup>2</sup>, Brian A. Anderson<sup>3</sup>, Susan M. Courtney<sup>1</sup>; <sup>1</sup>Johns Hopkins University, <sup>2</sup>The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., <sup>3</sup>Texas A&M University

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster B39            Examination of phase-amplitude coupling during working memory updating and interactions with goal-directed attention ability**

Timothy K. Gray<sup>1</sup>, Araya Lacy<sup>1</sup>, Robert S. Ross<sup>1</sup>; <sup>1</sup>University of New Hampshire

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster B40            Neural oscillations in the prefrontal and superior temporal cortices predict spatial working memory performance**

Amy L. Proskovec<sup>1,2</sup>, Alex I. Wiesman<sup>2</sup>, Elizabeth Heinrichs-Graham<sup>2</sup>, Tony W. Wilson<sup>1,2</sup>; <sup>1</sup>University of Nebraska Omaha, <sup>2</sup>University of Nebraska Medical Center

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster B41            Relationships between white matter in infancy and subsequent language abilities in preschool**

Jennifer Zuk<sup>1,2</sup>, Michael Figuccio<sup>1</sup>, Xi Yu<sup>1</sup>, Joseph Sanfilippo<sup>1</sup>, Jade Dunstan<sup>1</sup>, Clarisa Carruthers<sup>1</sup>, Ellen Grant<sup>1,2</sup>, Nadine Gaab<sup>1,2,3</sup>; <sup>1</sup>Boston Children's Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Harvard Graduate School of Education

Topic Area: LANGUAGE: Development & aging

**Poster B42            Right lateralization of white matter tracts in infants with a genetic risk of developmental dyslexia**

Clarisa Carruthers<sup>1</sup>, Xi Yu<sup>1,2</sup>, Jennifer Zuk<sup>1,2</sup>, Jade Dunstan<sup>1</sup>, Joseph Sanfilippo<sup>1</sup>, P. Ellen Grant<sup>1,2</sup>, Nadine Gaab<sup>1,2,3</sup>; <sup>1</sup>Boston Children's Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Harvard Graduate School of Education

Topic Area: LANGUAGE: Development & aging

**Poster B43            Brain Activity During Executive Tasks Predicts Individual Differences in Reading Ability**

Kai Wang<sup>1</sup>, Marie Banich<sup>1</sup>, Daniel Leopold<sup>1</sup>, Andrew Reineberg<sup>1</sup>, Laurie Cutting<sup>2</sup>, Lee Thompson<sup>3</sup>, Erik Willcutt<sup>1</sup>, Stephen Petrill<sup>4</sup>; <sup>1</sup>University of Colorado Boulder, <sup>2</sup>Vanderbilt University, <sup>3</sup>Case Western Reserve University, <sup>4</sup>Ohio State University

Topic Area: LANGUAGE: Other

**Poster B44            A functional magnetic resonance imaging investigation of the overlap between voluntary and reflexive spatial attention and lexical and sublexical reading**

Chelsea Ekstrand<sup>1</sup>, Josh Neudorf<sup>1</sup>, Marla Mickelborough<sup>1</sup>, Layla Gould<sup>1</sup>, Ron Borowsky<sup>1</sup>; <sup>1</sup>University of Saskatchewan

Topic Area: LANGUAGE: Other

**Poster B45            Effects of polyglotism on functioning of the language, MD, and DMN networks**

Olessia Jouravlev<sup>1,2</sup>, Zachary Mineroff<sup>1</sup>, Evelina Fedorenko<sup>1,3,4</sup>;  
<sup>1</sup>Massachusetts Institute of Technology, <sup>2</sup>Carleton University, <sup>3</sup>Harvard  
Medical School, <sup>4</sup>Massachusetts General Hospital  
Topic Area: LANGUAGE: Other

**Poster B46 Modulatory Effects of Emotional Prosody on Neural Sensitivity to Speech Discrimination in Second Language Learners**

Chieh Kao<sup>1</sup>, Yang Zhang<sup>1</sup>; <sup>1</sup>University of Minnesota  
Topic Area: LANGUAGE: Other

**Poster B47 Phoneme learning in a musical context**

Mihye Choi<sup>1</sup>, Ertugrul Uysal<sup>1</sup>, Mohinish Shukla<sup>1</sup>; <sup>1</sup>University of  
Massachusetts Boston  
Topic Area: LANGUAGE: Other

**Poster B48 Predicting Reading Comprehension from Eye Movement Features using Deep Neural Network**

Xiaochuan Lindsey Ma<sup>1</sup>, Jinlong Hu<sup>2</sup>, Xiaowei Zhao<sup>3</sup>, Ping Li<sup>1</sup>; <sup>1</sup>Pennsylvania  
State University, <sup>2</sup>South China University of Technology, <sup>3</sup>Emmanuel College  
Topic Area: LANGUAGE: Other

**Poster B49 Two late positivities during sentence comprehension: The influence of wrap-up and cognitive control**

Trevor Brothers<sup>1,2</sup>, Eddie Wlotko<sup>3</sup>, Simone Riley<sup>1</sup>, Margarita Zeitlin<sup>1</sup>, Connie  
Choi<sup>1</sup>, Gina Kuperberg<sup>1,2</sup>; <sup>1</sup>Tufts University, <sup>2</sup>Massachusetts General  
Hospital, <sup>3</sup>Moss Rehabilitation Research Institute  
Topic Area: LANGUAGE: Semantic

**Poster B50 Effective Connectivity of Aphasic Bilingual Semantic Processing**

Robert Buckshaw II<sup>1</sup>, Erin Meier<sup>1</sup>, Swathi Kiran<sup>1</sup>; <sup>1</sup>Boston University  
Topic Area: LANGUAGE: Semantic

**Poster B51 Semantic processing of self-adaptors, emblems, and iconic gestures: An ERP study**

Kawai Chui<sup>1</sup>, Chia-Ying Lee<sup>2,3</sup>, Kanyu Yeh<sup>1</sup>, Pei-Chun Chao<sup>3</sup>; <sup>1</sup>National  
Chengchi University, Taiwan, <sup>2</sup>Academia Sinica, Taiwan, <sup>3</sup>National Yang-  
Ming University, Taiwan  
Topic Area: LANGUAGE: Semantic

**Poster B52 University students with a history of reading difficulty show reduced neural effects of word expectancy**

Suzanne Welcome<sup>1</sup>; <sup>1</sup>University of Missouri - St Louis  
Topic Area: LANGUAGE: Semantic

**Poster B53 A noisy channel account of ERP differences in sentence comprehension**

Veena D. Dwivedi<sup>1</sup>, Janahan Selvanayagam<sup>1</sup>, Victoria Witte<sup>2</sup>, Harmonie  
Chan<sup>1</sup>, Ted Gibson<sup>3</sup>; <sup>1</sup>Brock University, <sup>2</sup>Heidelberg University, <sup>3</sup>MIT  
Topic Area: LANGUAGE: Syntax

**Poster B54 Mechanisms of neural plasticity during recovery from sentence processing deficits in chronic stroke-induced aphasia: an fMRI study**

Elena Barbieri<sup>1</sup>, Jennifer E. Mack<sup>1</sup>, Brianna M. Dougherty<sup>1</sup>, Eduardo  
Europa<sup>1</sup>, Cynthia K. Thompson<sup>1</sup>; <sup>1</sup>Northwestern University, Evanston, IL  
Topic Area: LANGUAGE: Syntax

**Poster B55 Testing associations between peri-adolescent differences in declarative memory abilities, intrinsic brain networks, and regional cortical thickness in a cross-sectional sample**

David Warren<sup>1</sup>, Nicholas Christopher-Hayes<sup>1</sup>, Anthony Rangel<sup>1</sup>, Julia  
Stephen<sup>2</sup>, Vince Calhoun<sup>2</sup>, Yu-Ping Wang<sup>3</sup>, Tony Wilson<sup>1</sup>; <sup>1</sup>University of  
Nebraska Medical Center, <sup>2</sup>Mind Research Network, <sup>3</sup>Tulane University  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster B56 Age-related Differences in the Effects of Lying on Cognitive Control and Memory**

Laura Paige<sup>1</sup>, Angela Gutchess<sup>1</sup>; <sup>1</sup>Brandeis University  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster B57 Age Differences in Emotional Integrative Memory**

Shaina L. Garrison<sup>1</sup>, Kelly S. Giovanello<sup>1</sup>; <sup>1</sup>University of North Carolina at  
Chapel Hill  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster B58 A trade-off in category- and item-level learning: implications for development**

Erika Wharton-Shukster<sup>1</sup>, Amy S. Finn<sup>1</sup>; <sup>1</sup>University of Toronto  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster B59 Modeling the dynamic content, encoding, and retrieval of naturalistic stimuli**

Andrew Heusser<sup>1</sup>, Jeremy Manning<sup>1</sup>; <sup>1</sup>Dartmouth College  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B60 Map-like coding of personal preferences facilitates social learning.**

Raphael Kaplan<sup>1</sup>, Karl Friston<sup>1</sup>; <sup>1</sup>University College London  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B61 The role of the prefrontal cortex in accuracy of judgments of learning**

Alexandra M. Gaynor<sup>1</sup>, Elizabeth F. Chua<sup>1,2</sup>; <sup>1</sup>The Graduate Center, The City  
University of New York, <sup>2</sup>Brooklyn College, The City University of New York  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B62 Familiarity and Retrieval Monitoring Effects on Dorsal Striatum Connectivity across the Adult Lifespan**

Paul F Hill<sup>1,2</sup>, Marianne de Chastelaine<sup>1,2</sup>, Eleanor S Liu<sup>1,2</sup>, Michael D  
Rugg<sup>1,2</sup>; <sup>1</sup>University of Texas at Dallas, <sup>2</sup>Center for Vital Longevity  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B64 Representational similarity patterns predict subsequent source memory but are disrupted by task switching in temporo-occipital regions**

Carolin Sievers<sup>1</sup>, Fraser W. Smith<sup>1</sup>, Janak Saada<sup>1</sup>, Louis Renoult<sup>1</sup>;  
<sup>1</sup>University of East Anglia, UK  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B65 Pattern separation and integration in hippocampus are the result of memory reactivation during learning**

Robert Molitor<sup>1</sup>, Katherine Sherrill<sup>1</sup>, Neal Morton<sup>1</sup>, Alison Preston<sup>1</sup>;  
<sup>1</sup>University of Texas at Austin  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B66**      **What happens in the human brain when explicit warnings reduce false memories?**

Sara Cadavid<sup>1</sup>, M. Soledad Beato<sup>2</sup>, Mar Suarez<sup>2</sup>; <sup>1</sup>Universidad del Rosario, Colombia, <sup>2</sup>Universidad de Salamanca, Spain  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B67**      **Ultra-high resolution functional magnetic resonance imaging of hippocampal subfield networks during pattern separation**

Stephanie Langella<sup>1</sup>, Shaina Garrison<sup>1</sup>, Wei-Tang Chang<sup>1</sup>, Weili Lin<sup>1</sup>, Kelly Giovanello<sup>1</sup>; <sup>1</sup>University of North Carolina at Chapel Hill  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B68**      **Does aging influence the use of episodic memory in decision making?**

Hannah Tarder-Stoll<sup>1</sup>, Azara Lalla<sup>1</sup>, Lynn Hasher<sup>1</sup>, Katherine Duncan<sup>1</sup>; <sup>1</sup>University of Toronto  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B69**      **Prestimulus subsequent memory effects differ as a result of informative or uninformative cues**

Eleanor Liu<sup>1,2</sup>, Paul F Hill<sup>1,2</sup>, Marianne de Chastelaine<sup>1,2</sup>, Michael D Rugg<sup>1,2</sup>; <sup>1</sup>University of Texas at Dallas, <sup>2</sup>Center for Vital Longevity  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B70**      **Hippocampal-Thalamic Contributions to Associative Memory**

Kirk T. Geier<sup>1</sup>, Rosanna K. Olsen<sup>1,2</sup>; <sup>1</sup>Rotman Research Institute, <sup>2</sup>University of Toronto  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster B71**      **The Effect of Incentives on Pupil Dilation During Recognition Memory**

Lisa Solinger<sup>1</sup>, Ian Dobbins<sup>1</sup>; <sup>1</sup>Washington University in St. Louis  
Topic Area: LONG-TERM MEMORY: Other

**Poster B72**      **Neural interactions between memory and language: The role of language profile on semantic processing leading to true and false memories**

Eugenia Marin-Garcia<sup>1</sup>, Pedro M. Paz-Alonso<sup>2</sup>; <sup>1</sup>University of the Basque Country, <sup>2</sup>BCBL  
Topic Area: LONG-TERM MEMORY: Semantic

**Poster B73**      **Probing the transition of novel information towards familiarity**

Amnon Yacoby<sup>1</sup>, Anat Maril<sup>1</sup>; <sup>1</sup>Hebrew University of Jerusalem  
Topic Area: LONG-TERM MEMORY: Semantic

**Poster B74**      **Encoding of episodic context in abstract and concrete concepts**

Charles P. Davis<sup>1,2</sup>, Pedro M. Paz-Alonso<sup>3</sup>, Gerry T. M. Altmann<sup>1,2</sup>, Eiling Yee<sup>1,2</sup>; <sup>1</sup>University of Connecticut, <sup>2</sup>Connecticut Institute for the Brain and Cognitive Sciences, <sup>3</sup>Basque Center on Cognition, Brain, and Language  
Topic Area: LONG-TERM MEMORY: Semantic

**Poster B75**      **Investigating the efficacy of digital simulations for procedural learning.**

Wen Qian Zhang<sup>1</sup>, Victoria A Roach<sup>2</sup>, Rebecca M Todd<sup>1</sup>, James H Kryklywy<sup>1</sup>; <sup>1</sup>University of British Columbia, <sup>2</sup>Oakland University  
Topic Area: LONG-TERM MEMORY: Skill learning

**Poster B76**      **Frequency-dependent temporal fluctuations of functional connectivity within intrinsic networks in human cortex**

Aaron Kucyi<sup>1</sup>, Josef Parvizi<sup>1</sup>; <sup>1</sup>Stanford University  
Topic Area: METHODS: Electrophysiology

**Poster B77**      **The effects of obesity on olfactory and visual event-related potentials**

Andrew J. Fiscella<sup>1</sup>, Claire Murphy<sup>1</sup>; <sup>1</sup>San Diego State University  
Topic Area: METHODS: Electrophysiology

**Poster B78**      **NIH Funded NITRC's Triad of Services: Software, Data, Compute**

Christian Haselgrove<sup>1,2</sup>, Robert Buccigrossi<sup>3</sup>, Albert Crowley<sup>3</sup>, David Kennedy<sup>2</sup>, Abby Paulson<sup>3</sup>, Nina Preuss<sup>3</sup>, Matt Travers<sup>3</sup>; <sup>1</sup>Neuromorphometrics, Inc, <sup>2</sup>University of Massachusetts Medical School, <sup>3</sup>TCG, Inc  
Topic Area: METHODS: Neuroimaging

**Poster B79**      **The specificity and robustness of long-distance connections in weighted inter-areal structural brain networks**

Richard Betzel<sup>1</sup>, Danielle Bassett<sup>1</sup>; <sup>1</sup>University of Pennsylvania  
Topic Area: METHODS: Neuroimaging

**Poster B81**      **Increased Default Mode Network Functional Connectivity in Individuals with Greater Meditative Experience**

Lauren Goodes<sup>1</sup>, Yush Kukreja<sup>2</sup>, Jeffrey Rouse M.D.<sup>2</sup>, Jeremy D. Cohen Ph.D.<sup>1</sup>; <sup>1</sup>Xavier University of Louisiana, New Orleans, LA, USA, <sup>2</sup>Tulane University, New Orleans, LA, USA  
Topic Area: METHODS: Neuroimaging

**Poster B82**      **Local Heterogeneity Regression Analysis: A Novel Measure of Representational Sparseness in Reading**

Jeremy Purcell<sup>1</sup>, Brenda Rapp<sup>1</sup>; <sup>1</sup>Johns Hopkins University  
Topic Area: METHODS: Neuroimaging

**Poster B83**      **Effects of Prefrontal tDCS on Executive Function: Methodological Considerations Revealed by Meta-Analysis**

Michael Imburgio<sup>1</sup>, Madison Parks<sup>1</sup>, Lane Bannwart<sup>1</sup>, Joseph Orr<sup>1</sup>; <sup>1</sup>Texas A&M University  
Topic Area: METHODS: Other

**Poster B84**      **Evidence of Non-reciprocal Topological Connections between Frontal Association Cortex and Temporal Cortex in the Rat**

Stacey Bedwell<sup>1</sup>, Chris Tinsley<sup>2</sup>; <sup>1</sup>Birmingham City University, <sup>2</sup>Nottingham Trent University  
Topic Area: NEUROANATOMY

**Poster B85**      **Frontal Cortex and Executive Functions in Healthy and Neuropsychiatric Samples: A Meta-Analysis of Structural Neuroimaging Studies**

Valeria Vilomar<sup>1,2</sup>, Abigail B. Waters<sup>1</sup>, Lance P. Swenson<sup>1</sup>, David A. Gansler<sup>1</sup>; <sup>1</sup>Suffolk University, <sup>2</sup>University of Puerto Rico  
Topic Area: NEUROANATOMY

**Poster B86** **In vivo manganese tract tracing of macaque saccadic eye movement circuitry: a comparison with diffusion tensor imaging**

David J Schaeffer<sup>1</sup>, Kevin Johnston<sup>1</sup>, Joseph S Gati<sup>1</sup>, Ravi S Menon<sup>1</sup>, Stefan Everling<sup>1</sup>; <sup>1</sup>Robarts Research Institute, University of Western Ontario, London, Ontario, Canada  
Topic Area: NEUROANATOMY

**Poster B87** **The subtle impact of oscillatory phase on auditory detection**

Yue Sun<sup>1</sup>, Oded Ghitza<sup>1,2</sup>, David Poeppel<sup>1,3</sup>; <sup>1</sup>Max Planck Institute for Empirical Aesthetics, Frankfurt am Main, Germany, <sup>2</sup>Boston University, Boston, USA, <sup>3</sup>New York University, New York, USA  
Topic Area: PERCEPTION & ACTION: Audition

**Poster B88** **Neural Responses to Narrative Speech Differentiate Patients with Disordered Consciousness**

Ivan Iotzov<sup>1</sup>, Brian C Fidali<sup>2</sup>, Agustin Petroni<sup>1</sup>, Mary M Conte<sup>2</sup>, Nicholas D Schiff<sup>2</sup>, Lucas C Parra<sup>1</sup>; <sup>1</sup>City College of New York, <sup>2</sup>Laboratory of Cognitive Neuromodulation, The Feil Family Brain and Mind Research Institute, Weill Cornell Medicine  
Topic Area: PERCEPTION & ACTION: Audition

**Poster B89** **Low-Frequency Oscillations Mediate Cortical-Subcortical Communication During Auditory Novelty Processing**

Marc Recasens<sup>1</sup>, Joachim Gross<sup>1</sup>, Peter Uhlhaas<sup>1</sup>; <sup>1</sup>University of Glasgow  
Topic Area: PERCEPTION & ACTION: Audition

**Poster B90** **Group Drumming Communication Program, Effects on Cognitive and Motor Functions in Older Adults with Dementia at a Special Elderly Nursing Home**

Atsuko Miyazaki<sup>1</sup>, Rui Nouchi<sup>2</sup>, Takashi Okuyama<sup>3</sup>, Hayato Mori<sup>1</sup>, Kazuhisa Sato<sup>4</sup>, Naoyuki Miyajima<sup>5</sup>, Masahiko Ichiki<sup>6</sup>, Shinichiro Nakamura<sup>1</sup>; <sup>1</sup>RIKEN, Saitama, Japan., <sup>2</sup>Tohoku University, Sendai, Japan., <sup>3</sup>Kobe University School of Medicine, Kobe, Japan (part-time lecturer)., <sup>4</sup>Care 21 Co., Ltd., Tokyo, Japan., <sup>5</sup>Social Welfare Corporation Tenyu, Saitama, Japan., <sup>6</sup>Tokyo Medical University, Tokyo, Japan.  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster B91** **Kids don't see what we see: Young children are less likely to experience an illusion that requires perceptual integration**

Kay Otsubo<sup>1</sup>, Danielle Lim<sup>1</sup>, Asaf Gilboa<sup>2</sup>, Morgan Barense<sup>1</sup>, Amy Finn<sup>1</sup>; <sup>1</sup>University of Toronto, <sup>2</sup>Rotman Research Institute at Baycrest  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster B92** **White matter microstructure in sensorimotor cortices and tracts predicts motor imagery ability in young adults**

Christian Hyde<sup>1</sup>, Ian Fuelscher<sup>1</sup>, Peter Enticott<sup>1</sup>, Jarrad Lum<sup>1</sup>, Karen Caeyenberghs<sup>2</sup>; <sup>1</sup>Cognitive Neuroscience Unit, School of Psychology, Deakin University, Geelong, Australia., <sup>2</sup>School of Psychology, Faculty of Health Sciences, Australian Catholic University, Melbourne, Australia.  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster B93** **No-movement awareness induces ERP modulations after long-term limb immobilization in a Go/Nogo task**

Valentina Bruno<sup>1</sup>, Irene Ronga<sup>1</sup>, Carlotta Fossataro<sup>1</sup>, Francesca Garbarini<sup>1</sup>; <sup>1</sup>SAMBA – SpAtial, Motor & Bodily Awareness – Research Group, Psychology Department, University of Turin, Turin, Italy

Topic Area: PERCEPTION & ACTION: Motor control

**Poster B94** **Cognitive tuning of the defensive peripersonal space is influenced by postural adjustment ability**

Marco Bove<sup>1</sup>, Monica Biggio<sup>1</sup>, Ambra Bisio<sup>1</sup>, Piero Ruggeri<sup>1</sup>; <sup>1</sup>University of Genoa, Italy  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster B95** **Exercise impacts information processing and neural activity under varying cognitive demands in children treated for brain tumours**

Elizabeth Cox<sup>1,2</sup>, Sonya Bells<sup>1</sup>, Janine Piscione<sup>1</sup>, Brian W. Timmons<sup>3,4</sup>, Ute Bartels<sup>1,2</sup>, Cynthia de Medeiros<sup>1</sup>, Jovanka Skocic<sup>1</sup>, Kiran Beera<sup>1</sup>, Suzanne Laughlin<sup>1,2</sup>, Donald J. Mabbott<sup>1,2</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, Ontario, Canada, <sup>2</sup>University of Toronto, Toronto, Ontario, Canada, <sup>3</sup>McMaster University, Hamilton, Ontario, Canada, <sup>4</sup>McMaster Children's Hospital, Hamilton, Ontario, Canada  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster B96** **Deficient posterior-to-frontal alpha-frequency connectivity and re-experiencing symptoms in combat-exposed veterans: a sensory model for PTSD**

Kevin Clancy<sup>1</sup>, Alejandro Albizu<sup>1</sup>, Mingzhou Ding<sup>2</sup>, Wen Li<sup>1</sup>; <sup>1</sup>Florida State University, <sup>2</sup>University of Florida - Gainesville  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster B97** **Combining kinesthetic illusion and action observation to evoke cortical plasticity in the primary motor cortex**

Ambra Bisio<sup>1</sup>, Monica Biggio<sup>1</sup>, Piero Ruggeri<sup>1</sup>, Laura Avanzino<sup>1</sup>, Marco Bove<sup>1</sup>; <sup>1</sup>University of Genoa, Italy  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster B98** **Exploring Categorical and Functional Boundaries of Tactile Perception Using Somatosensory Mismatch Responses**

Guannan Shen<sup>1</sup>, Peter J. Marshall<sup>1</sup>; <sup>1</sup>Department of Psychology, Temple University  
Topic Area: PERCEPTION & ACTION: Other

**Poster B99** **Degree of responsibility influences outcome evaluation in joint action**

Janeen Loehr<sup>1</sup>, Sarah Ardell<sup>1</sup>, Dimitrios Kourtis<sup>2</sup>; <sup>1</sup>University of Saskatchewan, Canada, <sup>2</sup>University of Stirling, United Kingdom  
Topic Area: PERCEPTION & ACTION: Other

**Poster B101** **Impaired inter-hemispheric connectivity is a predictor of the failure to retrieve meaning from shape in visual agnosia**

Radek Ptak<sup>1,2</sup>, François Lazeyras<sup>3</sup>; <sup>1</sup>Division of Neurorehabilitation, Department of Clinical Neurosciences, Geneva University Hospitals, Geneva, Switzerland, <sup>2</sup>Faculty of Psychology and Educational Sciences, University of Geneva, Geneva, Switzerland, <sup>3</sup>Department of Radiology and Medical Informatics, University of Geneva, Geneva, Switzerland  
Topic Area: PERCEPTION & ACTION: Vision

**Poster B102      The effects of tDCS on orientation discrimination task performance**

Abdullah Bin Dawood<sup>1</sup>, Abigail Dickinson<sup>2</sup>, Ali Aytemur<sup>1</sup>, Clare Howarth<sup>1</sup>, Elizabeth Milne<sup>1</sup>, Myles Jones<sup>1</sup>; <sup>1</sup>The University of Sheffield, Sheffield, UK, <sup>2</sup>University of California, Los Angeles, CA, USA  
Topic Area: PERCEPTION & ACTION: Vision

**Poster B103      Local field potential recordings reveal enhanced feedback in the primate visual system for familiar compared to novel objects**

Ryan E.B. Mruzek<sup>1</sup>, Amalia K. Davis<sup>1</sup>, David L. Sheinberg<sup>2</sup>; <sup>1</sup>Worcester State University, <sup>2</sup>Brown University

Topic Area: PERCEPTION & ACTION: Vision

**Poster B104      Mechanisms for sampling distinct memory stores during decision-making**

Avinash Vaidya<sup>1</sup>, David Badre<sup>1</sup>; <sup>1</sup>Brown University, Department of Cognitive, Linguistic and Psychological Sciences  
Topic Area: THINKING: Decision making

**Poster B105      The Neural Underpinnings of Projection Bias**

Roni Setton<sup>1</sup>, Geoffrey Fisher<sup>2</sup>, R. Nathan Spreng<sup>1</sup>; <sup>1</sup>McGill University, <sup>2</sup>Cornell University

Topic Area: THINKING: Decision making

**Poster B106      Teens care more about their friends: An ERP study of social reward learning in adolescents and adults**

Xingjie Chen<sup>1</sup>, Youngbin Kwak<sup>1</sup>; <sup>1</sup>University of Massachusetts Amherst  
Topic Area: THINKING: Decision making

**Poster B107      The Unfolding Action Model of initiation times, movement times, and movement paths**

Cristian Buc Calderon<sup>1</sup>, Wim Gevers<sup>2</sup>, Tom Verguts<sup>1</sup>; <sup>1</sup>Ghent University, Department of Experimental Psychology, <sup>2</sup>Université Libre de Bruxelles, Center for Cognition and Neurosciences  
Topic Area: THINKING: Decision making

**Poster B108      Family History of Substance Abuse Affects Adolescents' Choices**

Yael M. Cykowicz<sup>1,2</sup>, Diana Rodriguez Moreno<sup>1</sup>, Lawrence V. Amsel<sup>1,2</sup>, Chase A. Hill<sup>1</sup>, Zhishun Wang<sup>1,2</sup>, Xiaofu He<sup>1,2</sup>, Christina Hoven<sup>1,2</sup>; <sup>1</sup>New York State Psychiatric Institute, <sup>2</sup>Columbia University  
Topic Area: THINKING: Decision making

**Poster B109      Reliability of the Correlative Triad among Aging, Dopamine, and Cognition**

Eric J. Juarez<sup>1</sup>, Jaime J. Castellon<sup>1</sup>, Mikella A. Green<sup>1</sup>, Galen A. McAllister<sup>1</sup>, Kendra L. Seaman<sup>1</sup>, Christopher T. Smith<sup>2</sup>, Linh C. Dang<sup>2</sup>, David H. Zald<sup>2</sup>, Gregory R. Samanez-Larkin<sup>1</sup>; <sup>1</sup>Duke University, <sup>2</sup>Vanderbilt University  
Topic Area: THINKING: Development & aging

**Poster B110      Insight is facilitated by high definition tDCS to the right temporal lobe**

Carola Salvi<sup>1,2</sup>, Ryan Conrardy<sup>2</sup>, Richard McKinley<sup>3</sup>, Mark Beeman<sup>1</sup>, Jordan Grafman<sup>2,4,5</sup>; <sup>1</sup>Department of Psychology, Northwestern University, Chicago, Illinois, USA, <sup>2</sup>Shirley Ryan Ability Lab, Chicago, Illinois, USA, <sup>3</sup>Air Force Research Laboratory, Wright-Patterson AFB, Ohio, USA, <sup>4</sup>Department of Neurology, Feinberg School of Medicine, Northwestern University, Chicago,

Illinois, USA, <sup>5</sup>Department of Physical Medicine and Rehabilitation, Feinberg School of Medicine, Northwestern University, Chicago, Illinois, USA  
Topic Area: THINKING: Problem solving

**Poster B111      Investigating verbal creative problem solving - the role of search as a function of task difficulty**

Maxi Becker<sup>1</sup>, Simone Kühn<sup>1</sup>; <sup>1</sup>University Medical Center Hamburg-Eppendorf  
Topic Area: THINKING: Problem solving

**Poster B112      On the Influence of Regulated Emotions on Pain Processing**

Philipp Reicherts<sup>1</sup>, Christiane Hoessle<sup>1</sup>, Matthias J. Wieser<sup>2</sup>, Paul Pauli<sup>1</sup>; <sup>1</sup>University of Wuerzburg, <sup>2</sup>Erasmus University Rotterdam  
Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster B113      The relationship between moral reasoning and theory of mind effective connectivity**

Araya Lacy<sup>1</sup>, Timothy K. Gray<sup>1</sup>, Robert S. Ross<sup>1,2</sup>; <sup>1</sup>University of New Hampshire Neuroscience and Behavior Program, <sup>2</sup>University of New Hampshire Psychology Department  
Topic Area: EMOTION & SOCIAL: Other

**Poster B114      White Matter and Social Cognition**

Athanasia Metoki<sup>1</sup>, Yin Wang<sup>1</sup>, Kyie H. Alm<sup>1</sup>, Ingrid R. Olson<sup>1</sup>; <sup>1</sup>Temple University, Department of Psychology  
Topic Area: EMOTION & SOCIAL: Person perception

**Poster B115      The Perception and Cognition of Racialized Voices**

Tedra James<sup>1</sup>, Maxime Bouvagnet<sup>1</sup>, Psyche Loui<sup>1</sup>; <sup>1</sup>Wesleyan University  
Topic Area: EMOTION & SOCIAL: Person perception

**Poster B116      Sex Differences in Brain Network Connectivity Subserving Theory of Mind in Individuals with Alcohol Use Disorder**

Sergey V. Chernyak<sup>1</sup>, Marisa M. Silveri<sup>1,2</sup>, Amy Janes<sup>1</sup>, Jennifer T. Sneider<sup>1</sup>, Shelly Greenfield<sup>1</sup>, Lisa Nickerson<sup>1</sup>; <sup>1</sup>McLean Hospital, Harvard Medical School, Belmont, MA, <sup>2</sup>Boston University School of Medicine, Boston, MA  
Topic Area: EMOTION & SOCIAL: Self perception

**Poster B117      Efficacy of EEG Neurofeedback in Individuals with Traumatic Brain Injury: Does Age Matter?**

Marielle L. Darwin<sup>1</sup>, Savannah Regensburger<sup>1</sup>; <sup>1</sup>Colorado State University  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B118      Susceptibility to boredom predicted by cortical grey matter volume in adolescents with familial risk for alcoholism**

Arkadiy L. Maksimovskiy<sup>1,4</sup>, Anna Seraikas<sup>1</sup>, Emily Oot<sup>1,5</sup>, Maya Rieselbach<sup>1</sup>, Carolyn Caine<sup>1</sup>, Julia Cohen-Gilbert<sup>1,4</sup>, Jennifer T. Sneider<sup>1,4</sup>, Sion K. Harris<sup>3</sup>, Lisa Nickerson<sup>2,4</sup>, Marisa M. Silveri<sup>1,4,5</sup>; <sup>1</sup>Neurodevelopmental Laboratory on Addictions and Mental Health, McLean Imaging Center, McLean Hospital, Belmont, MA, <sup>2</sup>Applied Neuroimaging Statistics Lab, McLean Imaging Center, McLean Hospital, Belmont, MA, <sup>3</sup>Boston Children's Hospital, Harvard Medical School, Boston, MA, <sup>4</sup>Harvard Medical School, Boston, MA, <sup>5</sup>Boston University School of Medicine, Boston, MA  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B119      Effects of Multicomponent Training of Cognitive Control (MTCC) on Cognitive and Brain Structural Changes in Adolescents**

Dasom Lee<sup>1</sup>, Seyul Kwak<sup>1</sup>, Jeanyung Chey<sup>1</sup>; <sup>1</sup>Seoul National University  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B120 Age-Related Declines in Cerebellar-Basal Ganglia Functional Circuits: Implications for Motor Function in Older Adulthood**

Hanna K. Hausman<sup>1</sup>, T. Bryan Jackson<sup>1</sup>, Jessica A. Bernard<sup>1</sup>; <sup>1</sup>Texas A&M University

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster B121 Investigating individual differences in context dependent rule learning performance**

Allen Chang<sup>1</sup>, Yiren Ren<sup>1</sup>, Andrew Whiteman<sup>1,2</sup>, Chantal Stern<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>University of Michigan-Ann Arbor

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster B122 Reduced Feedback-Based Performance Monitoring at the FRN level When Goal Impact is Transiently Increased**

Mario Carlo Severo<sup>1</sup>, Wioleta Walentowska<sup>2,1</sup>, Agnes Moors<sup>3,1</sup>, Gilles Pourtois<sup>1</sup>; <sup>1</sup>Ghent University, <sup>2</sup>Jagiellonian University in Krakow, <sup>3</sup>KU Leuven

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster B123 Dissociating Components of Multitasking Using HD-tDCS**

Francesca Raileanu<sup>1</sup>, Thomas McWilliams<sup>1</sup>, Geoffrey Genova<sup>1</sup>, Scott Mongold<sup>1</sup>, Morgan Taylor<sup>1</sup>, Jasper Park<sup>1</sup>, Anisha Jain<sup>1</sup>, Isabella Montoya<sup>1</sup>, Joseph Pajka<sup>1</sup>, Erika Hussey<sup>1,2</sup>, Nathan Ward<sup>1</sup>; <sup>1</sup>Tufts University, <sup>2</sup>Natick Soldier Research, Development, and Engineering Center

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster B124 Motor conflict and error saliency: The ERN predicts post-error reductions in P1 at short response-stimulus intervals**

Paul Beatty<sup>1</sup>, George Buzzell<sup>1,2</sup>, Daniel Roberts<sup>1</sup>, Craig McDonald<sup>1</sup>; <sup>1</sup>George Mason University, <sup>2</sup>University of Maryland

Paul Beatty<sup>1</sup>, George Buzzell<sup>1,2</sup>, Daniel Roberts<sup>1</sup>, Craig McDonald<sup>1</sup>; <sup>1</sup>George Mason University, <sup>2</sup>University of Maryland

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster B125 Separating Inhibitory and Attentional Neural Signals in the Stop-Signal Paradigm**

Darcy Waller<sup>1</sup>, Jan Wessel<sup>1</sup>; <sup>1</sup>University of Iowa

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster B126 Individual differences in executive control as a function of combination of trait mindfulness, trait anxiety and associated neural correlates**

Satish Jaiswal<sup>1</sup>, Shao-Yang Tsai<sup>1</sup>, Neil G. Muggleton<sup>1,2,3</sup>, Chi-Hung Juan<sup>1</sup>, Wei-Kuang Liang<sup>1</sup>; <sup>1</sup>National Central University, <sup>2</sup>University College London, <sup>3</sup>Goldsmiths, University of London

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster B127 Differential activation of rostral prefrontal cortex (BA 10) in autism spectrum disorder: An fNIRS study of time-based, prosocial prospective memory**

James Crum<sup>1</sup>; <sup>1</sup>University College London

Topic Area: EXECUTIVE PROCESSES: Other

**Poster B128 Dopaminergic modulation of rostral-caudal fronto-striatal loops**

David Amadeus Vogelsang<sup>1,2</sup>, Daniella J. Furman<sup>1,2</sup>, Mark D'Esposito<sup>1,2</sup>; <sup>1</sup>Helen Wills Neuroscience Institute, University of California, Berkeley, California, 94720, United States, <sup>2</sup>Department of Psychology, University of California, Berkeley, California, 94720, United States

Topic Area: EXECUTIVE PROCESSES: Other

**Poster B129 EEG correlates of working memory for action**

Edmund Wascher<sup>1</sup>, Bianca Zickerig<sup>1</sup>, Stephan Getzmann<sup>1</sup>, Stefan Arnau<sup>1</sup>, Sven Thönes<sup>1</sup>, Daniel Schneider<sup>1</sup>; <sup>1</sup>Leibniz Research Centre for Working Environments and Human Factors

Topic Area: EXECUTIVE PROCESSES: Working memory

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## Poster Session C

Sunday, March 25, 1:00-3:00 pm

**Poster C1 Comparisons of Mismatch Negativity in Clinical High Risk and Schizophrenia Populations**

Ian T. Kim<sup>1</sup>, Migyung Lee<sup>1,2</sup>, Pejman Sehatpour<sup>1,2</sup>, Cheryl M. Corcoran<sup>1</sup>, Daniel C. Javitt<sup>1,2</sup>; <sup>1</sup>Columbia University Medical Center, <sup>2</sup>Nathan Kline Institute

Topic Area: EMOTION & SOCIAL: Other

**Poster C2 Improving auditory spatial attention by non-invasive brain stimulation and training**

Stephan Getzmann<sup>1</sup>, Christina Hanenberg<sup>1,2</sup>, Joerg Lewald<sup>1,2</sup>; <sup>1</sup>Leibniz Research Centre for Working Environment and Human Factors (IfADo), Germany, <sup>2</sup>Ruhr University Bochum, Germany

Topic Area: ATTENTION: Auditory

**Poster C3 Implicit temporal orienting of attention is preserved in healthy aging**

Hunter Johndro<sup>1</sup>, Monica Lyons<sup>1</sup>, Aniruddh D. Patel<sup>1</sup>, Elizabeth Race<sup>1</sup>; <sup>1</sup>Tufts University

Topic Area: ATTENTION: Development & aging

**Poster C4 Working memory recruitment and network membership of visual, auditory and tactile sensory-biased regions in lateral frontal cortex**

Sean M. Tobyne<sup>1</sup>, Abigail L. Noyce<sup>1</sup>, James A. Brissenden<sup>1</sup>, Stephanie R. Jones<sup>2</sup>, Manuel Gomez-Ramirez<sup>2</sup>, Christopher I. Moore<sup>2</sup>, David C. Somers<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>Brown University

Topic Area: ATTENTION: Multisensory

**Poster C5 Convergent functional network connectivity changes in stimulus-driven attention and awareness**

Hana Eaton<sup>1</sup>, Hongyang Sun<sup>1</sup>, Jocelyn Sy<sup>1</sup>, Doug Godwin<sup>1</sup>, Padma Raghavan<sup>1</sup>, Rene Marois<sup>1</sup>; <sup>1</sup>Vanderbilt University

Topic Area: ATTENTION: Nonspatial

**Poster C6 Neural mechanisms of reflexive social attention: a combined eye-tracking and fMRI study**

Lara Rösler<sup>1</sup>, Matthias Gamer<sup>1</sup>; <sup>1</sup>Julius Maximilians University of Würzburg, Würzburg, Germany

Topic Area: ATTENTION: Other

**Poster C7 Caffeine boosts preparatory attention for reward-related information**

Marlon de Jong<sup>1</sup>, Berry van den Berg<sup>1,2</sup>, Marty G. Woldorff<sup>2</sup>, Monique M. Lorist<sup>1</sup>; <sup>1</sup>University of Groningen, Groningen, Netherlands, <sup>2</sup>Duke University, Durham, NC 27708, United States

Topic Area: ATTENTION: Other

**Poster C8 Same underlying neural mechanisms for spatial neglect and anosognosia for functional disability**

Stephanie A. Waldman<sup>1</sup>, Peii Chen<sup>2</sup>, Meghan D. Caulfield<sup>1,2</sup>; <sup>1</sup>Lafayette College, Easton PA, <sup>2</sup>Kessler Foundation, West Orange, NJ

Topic Area: ATTENTION: Spatial

**Poster C9 Dynamics of parietal lobe activity predict variability in sustained attention**

AJ Simon<sup>1</sup>, Richard Campusano<sup>1</sup>, Josh Volponi<sup>1</sup>, Sasha Skinner<sup>1</sup>, Joaquin Anguera<sup>1</sup>, Adam Gazzaley<sup>1</sup>, David A. Ziegler<sup>1</sup>; <sup>1</sup>UCSF, <sup>2</sup>UCSF, <sup>3</sup>UCSF, <sup>4</sup>UCSF, <sup>5</sup>UCSF, <sup>6</sup>UCSF, <sup>7</sup>UCSF

Topic Area: ATTENTION: Spatial

**Poster C10 Differential neural activity for self-referentially processed objects in older and younger adults**

Ryan T. Daley<sup>1</sup>, Holly J. Bowen<sup>1</sup>, Katelyn R. Parisi<sup>1,2</sup>, Elizabeth A. Kensinger<sup>1</sup>, Angela H. Gutchess<sup>2</sup>; <sup>1</sup>Boston College, <sup>2</sup>Brandeis University

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster C11 Neural Correlates of Loneliness in Adolescence**

Janelle Beadle<sup>1</sup>, Mallory Feenstra<sup>1</sup>, Abi M. Heller<sup>1</sup>, Vince D. Calhoun<sup>2,5</sup>, Julia Stephen<sup>2,5</sup>, Yu-Ping Wang<sup>3</sup>, David E. Warren<sup>4</sup>, Tony W. Wilson<sup>4</sup>; <sup>1</sup>University of Nebraska at Omaha, <sup>2</sup>University of New Mexico, <sup>3</sup>Tulane University, <sup>4</sup>University of Nebraska Medical Center, <sup>5</sup>The Mind Research Network

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster C13 For the Win! The Role of Emotion Regulation in Competitive Gaming Performance**

Kyle Nolla<sup>1</sup>, Mark Beeman<sup>1</sup>; <sup>1</sup>Northwestern University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster C14 Emotion processing in Moebius Syndrome**

Shruti Japee<sup>1</sup>, Jessica Jordan<sup>1</sup>, Savannah Lokey<sup>1</sup>, Chris Baker<sup>1</sup>, Leslie Ungerleider<sup>1</sup>; <sup>1</sup>Lab of Brain and Cognition, NIMH/NIH

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster C15 The Impact of Anxious Arousal on the Discrimination Between Threat and Safety Cues**

Nadia Haddara<sup>1,2</sup>, L. Jack Rhodes<sup>1</sup>, Thomas Nguyen<sup>1</sup>, Kendra Deschamps<sup>1</sup>, Stephanie Ijomah<sup>1</sup>, Erica Miller<sup>1</sup>, Vladimir Miskovic<sup>1,2</sup>; <sup>1</sup>SUNY Binghamton, <sup>2</sup>Center for Affective Science, SUNY Binghamton

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster C16 Prosodic influence in face emotion perception: evidence from electroencephalography**

Katherine M Becker<sup>1</sup>, Donald C Rojas<sup>1</sup>; <sup>1</sup>Colorado State University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster C17 Low-frequency connectivity with memory regions during stress and alcohol cue exposure distinguishes alcoholics from social drinkers**

Elizabeth V. Goldfarb<sup>1</sup>, Dongju Seo<sup>1</sup>, R. Todd Constable<sup>1</sup>, Rajita Sinha<sup>1</sup>; <sup>1</sup>Yale University School of Medicine

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster C18 Patient-clinician concordance in social mirroring circuitry supports non-verbal communication and placebo analgesia in the context of pain treatment – a fMRI hyperscanning study**

Dan-Mikael Ellingsen<sup>1,2</sup>, Changjin Jung<sup>1,2,3</sup>, Jeungchan Lee<sup>1,2</sup>, Kylie Isenburg<sup>1,2</sup>, Jessica Gerber<sup>1,2</sup>, Ishtiaq Mawla<sup>1,2</sup>, Roberta Sclocco<sup>1,2</sup>, Robert R Edwards<sup>4</sup>, John Kelley<sup>5</sup>, Irving Kirsch<sup>2</sup>, Ted J Kaptchuk<sup>2</sup>, Vitaly Napadow<sup>1,2</sup>;

<sup>1</sup>Massachusetts General Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Korea Institute of Oriental Medicine, Daejeon, Korea (the Republic of), <sup>4</sup>Brigham and Women's Hospital, Boston, MA, <sup>5</sup>Endicott College, Beverly, MA

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster C19 Personality Measures and Reward-Related Neural Activations among Individuals with Different Substance Using Patterns**

Tien Tong<sup>1</sup>, Jatin Vaidya<sup>1</sup>, John Kramer<sup>1</sup>, Samuel Kuperman<sup>1</sup>, Doug Langbehn<sup>1</sup>, Daniel O'Leary<sup>1</sup>; <sup>1</sup>University of Iowa Carver College of Medicine

Topic Area: EMOTION & SOCIAL: Other

**Poster C20 Effect of social context on stimuli processing: comparing the ERPs of individuals tested alone, with a friend or with a stranger**

Ashley Chau-Morris<sup>1</sup>, Maud Haffar<sup>1,3</sup>, Sheila Bouten<sup>1</sup>, Tarlan Daryoush<sup>1</sup>, Natalie Frye<sup>1</sup>, Ursula Hess<sup>4</sup>, Hugo Pantecouteau<sup>1,5</sup>, J. Bruno Debruille<sup>1,2,3</sup>;

<sup>1</sup>Research Center of the Douglas Institute, Montréal, Canada., <sup>2</sup>Department of Psychiatry, McGill University, Montréal, Canada., <sup>3</sup>Department of Neurosciences, McGill University, Montréal, Canada., <sup>4</sup>Department of Psychology, Humboldt University, Berlin, Germany., <sup>5</sup>École Normale Supérieure, Lyon, France

Topic Area: EMOTION & SOCIAL: Other

**Poster C21 Exposure to different bodies modulates eye movements to high- and low-calorie foods**

Fatemeh Fereidooni<sup>1</sup>, Natalie A. Ceballos<sup>1</sup>, Reiko Graham<sup>1</sup>; <sup>1</sup>Texas State University

Topic Area: EMOTION & SOCIAL: Person perception

**Poster C22 Probing the Time-course of Face Representations with Time-resolved Multivariate Pattern Analyses of EEG Signals**

Laurie Bayet<sup>1</sup>, Rachel Wu<sup>2</sup>, Benjamin Balas<sup>3</sup>, Richard N. Aslin<sup>4</sup>; <sup>1</sup>Boston Children's Hospital, Harvard Medical School, <sup>2</sup>University of California, Riverside, <sup>3</sup>North Dakota State University, <sup>4</sup>Haskins Laboratories

Topic Area: EMOTION & SOCIAL: Person perception

**Poster C23 Alterations in neural circuits supporting executive functions in children with reading difficulties**

Tzipi Horowitz-Kraus<sup>1,2</sup>, Rola Farah<sup>1</sup>; <sup>1</sup>Educational Neuroimaging Center, Faculty of Education in Science and Technology, Technion, Haifa, Israel, <sup>2</sup>Reading and Literacy Discovery Center, General Pediatrics, Cincinnati Children's Hospital Medical Center, Ohio, USA

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster C24 Socioeconomic Disadvantage, Prefrontal Cortical Structure, and Executive Function in School-Aged Children**



Pooja M. Desai<sup>1</sup>, Emily C. Merz<sup>2</sup>, Elaine Maskus<sup>2</sup>, Xiaofu He<sup>3</sup>, Kimberly G. Noble<sup>2</sup>; <sup>1</sup>Barnard College, Columbia University, <sup>2</sup>Teachers College, Columbia University, <sup>3</sup>Columbia University Medical Center

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster C25**                    **Local functional connectivity development in early childhood: Associations with socioeconomic status**

Ursula A Tooley<sup>1</sup>, Allyson P Mackey<sup>1</sup>; <sup>1</sup>University of Pennsylvania

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster C26**                    **The relative neuropsychological effects of physical, cognitive, and interactive exercise (IPACES™) for mild cognitive impairment (MCI): Pilot data comparing two-week windows of each as in-home interventions**

Kathryn M Wall<sup>1</sup>, Jessica Stark<sup>1</sup>, Alexa Schillaci<sup>1</sup>, Carolyn Doty<sup>1</sup>, Hannah Christian<sup>1</sup>, Anvit Karla-Lall<sup>1</sup>, Molly Maloney<sup>1</sup>, Cay Anderson-Hanley<sup>1</sup>; <sup>1</sup>Union College, NY

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster C27**                    **Differential associations between large-scale networks during externally and internally directed attention**

Julia W. Y. Kam<sup>1</sup>, Sandon Griffin<sup>1</sup>, Jack J. Lin<sup>2</sup>, Anne-Kristin Solbakk<sup>3</sup>, Tor Endestad<sup>3</sup>, Pal G. Larsson<sup>4</sup>, Robert T. Knight<sup>1</sup>; <sup>1</sup>University of California, Berkeley, <sup>2</sup>University of California, Irvine, <sup>3</sup>University of Oslo, <sup>4</sup>Oslo University Hospital

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster C28**                    **Learning Cognitive Flexibility: Neural Mechanisms of Adaptive Switch Readiness**

Anthony W. Sali<sup>1</sup>, Christina Bejjani<sup>1</sup>, Tobias Egner<sup>1</sup>; <sup>1</sup>Duke University

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster C29**                    **Effective connectivity via brain oscillations during cognitive control post-concussion**

Natasha Fansiwala<sup>1</sup>, Stephanie E. Barlow<sup>1</sup>, Paolo Medrano<sup>1</sup>, Robert S. Ross<sup>1</sup>; <sup>1</sup>University of New Hampshire

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster C30**                    **Conflict-related ERPs in the Temporal Flanker Task: N2 under conditions of perceptual mismatch and response conflict**

Kerstin Jost<sup>1</sup>, Mike Wendt<sup>2</sup>, Aquiles Luna-Rodriguez<sup>3</sup>, Andreas Löw<sup>3</sup>, Thomas Jacobsen<sup>3</sup>; <sup>1</sup>Brandenburg Medical School, <sup>2</sup>Medical School Hamburg, <sup>3</sup>Helmut-Schmidt-University/ University of the Federal Armed Forces Hamburg.

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster C31**                    **Dopaminergic polymorphisms C957T and ANKK1 contribute to distinct aspects of delay discounting**

Amy T Nusbaum<sup>1</sup>, John M Hinson<sup>1</sup>, Paul Whitney<sup>1</sup>; <sup>1</sup>Washington State University

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster C32**                    **The Feedback-Related Negativity, but not Frontal Midline Theta, Reflects Prediction Errors During Both Positive and Negative Reinforcement**

Eric Rawls<sup>1</sup>, Yoojin Lee<sup>2</sup>, Elizabeth Shirtcliff<sup>2</sup>, Connie Lamm<sup>1</sup>; <sup>1</sup>University of Arkansas, <sup>2</sup>Iowa State University

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster C33**                    **Altered Functional Networks Underlying Post-Error Adaptation in Women with Drug Use Disorder and Comorbid Post-Traumatic Stress Disorder**

Bradford S. Martins<sup>1</sup>, Clinton D. Kilts<sup>1</sup>, G. Andrew James<sup>1</sup>; <sup>1</sup>University of Arkansas for Medical Sciences

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster C34**                    **Dysexecutive impairment in first-episode of Schizophrenia**

Gricel Orellana<sup>1</sup>, Andrea Slachevsky<sup>1</sup>; <sup>1</sup>Facultad de Medicina, Universidad de Chile

Topic Area: EXECUTIVE PROCESSES: Other

**Poster C35**                    **Different procrastination measures correlate with different neural activities**

Zhoumao Duo<sup>1,2</sup>, Sunao Iwaki<sup>1,2</sup>; <sup>1</sup>National Institute of Advanced Industrial Science and Technology, <sup>2</sup>University of Tsukuba

Topic Area: EXECUTIVE PROCESSES: Other

**Poster C36**                    **Electrophysiological markers of stress on working memory networks in adolescents**

Alana Campbell<sup>1,2</sup>, Jessica Graham<sup>1</sup>, Margaret Nicopolis<sup>1,2</sup>, Louis Murphy<sup>1</sup>, Hannah Waltz<sup>1</sup>, Ashley Williams<sup>1</sup>, Candace Killian-Farrell<sup>1,2</sup>, Aysenil Belger<sup>1,2</sup>; <sup>1</sup>University of North Carolina at Chapel Hill, <sup>2</sup>Carolina Institute for Developmental Disabilities

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C37**                    **Frontoparietal EEG phase coupling reflects the maintenance and successful memory encoding of constructed objects in visual working memory**

Patrick H. Khader<sup>1,2</sup>, Satu Palva<sup>3</sup>, Frank Rösler<sup>4</sup>, Julia A. Ewerdwalbesloh<sup>2</sup>; <sup>1</sup>Brandenburg Medical School, Neuruppin, Germany, <sup>2</sup>Ludwig-Maximilians-Universität Munich, Germany, <sup>3</sup>University of Helsinki, Finland, <sup>4</sup>University of Hamburg, Germany

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C38**                    **The influence of storage capacity versus control in visual working memory capacity limitations**

Ying Cai<sup>1,2</sup>, Andrew D Sheldon<sup>3</sup>, Bradley R Postle<sup>2,4</sup>; <sup>1</sup>National Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, <sup>2</sup>Department of Psychiatry, University of Wisconsin–Madison, <sup>3</sup>Medical Scientist Training Program and Neuroscience Training Program, University of Wisconsin–Madison, <sup>4</sup>Department of Psychology, University of Wisconsin–Madison

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C39**                    **The circuit analyses of Anesthesia-resistant memory in Drosophila.**

Emmanuel Antwi-Adjei<sup>1</sup>, Diana Hilpert<sup>2</sup>, Martin Schwärzel<sup>1</sup>; <sup>1</sup>Free University Berlin

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C40**                    **Metabolic Syndrome and its Association with Self-Reported Sleep Quality and Cognitive Function**

Tori Ferland<sup>1,2</sup>, Saba Chowdhry<sup>3</sup>, William Milberg<sup>1,2</sup>, Regina McGlinchey<sup>1,2</sup>, Elizabeth Leritz<sup>1,2</sup>; <sup>1</sup>Harvard Medical School, <sup>2</sup>VA Boston Healthcare System, <sup>3</sup>Boston University School of Medicine  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C41 ANXIETY MODULATES AUTONOMIC REGULATION AND NEURAL ACTIVATION DURING HIGH-LOAD WORKING MEMORY FOLLOWING ACUTE STRESS IN ADOLESCENCE**

Jessica Graham<sup>1,2</sup>, Ashley Williams<sup>1,2</sup>, Candace Killian-Farrell<sup>1</sup>, Hannah Waltz<sup>1</sup>, Joshua Bizzell<sup>1</sup>, Erin King<sup>1</sup>, Alana Campbell<sup>1</sup>, Aysenil Belger<sup>1,2</sup>; <sup>1</sup>University of North Carolina at Chapel Hill, Department of Psychiatry, <sup>2</sup>Duke-UNC Brain Imaging Analysis Center  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C42 The impact of literacy on microstructural properties of white matter**

Falk Huettig<sup>1</sup>, Vidur Mahajan<sup>2</sup>, Madhuri Barnwal<sup>2</sup>, Nishant Lohagan<sup>3</sup>, Ouroz Khan<sup>3</sup>, Anuradha Singh<sup>3</sup>, Deepshikha Misra<sup>3</sup>, Vaishna Narang<sup>3</sup>, Ramesh Mishra<sup>4</sup>, Alexis Hervais-Adelman<sup>1</sup>; <sup>1</sup>Max Planck Institute for Psycholinguistics Nijmegen, <sup>2</sup>Mahajan Imaging Delhi, <sup>3</sup>Jawaharlal Nehru University New Delhi, <sup>4</sup>University of Hyderabad  
Topic Area: LANGUAGE: Development & aging

**Poster C43 Meaning above (and inside) the head: Electrophysiology to combinatorial visual morphology**

Neil Cohn<sup>1</sup>, Tom Foulsham<sup>2</sup>; <sup>1</sup>Tilburg University, <sup>2</sup>University of Essex  
Topic Area: LANGUAGE: Lexicon

**Poster C44 Testing native language neural commitment at the brainstem level: A cross-linguistic investigation of the association between frequency-following response and speech perception**

Luodi Yu<sup>1</sup>, Yang Zhang<sup>1</sup>; <sup>1</sup>Department of Speech-Language-Hearing Sciences, University of Minnesota, Minneapolis, MN, 55455, USA  
Topic Area: LANGUAGE: Other

**Poster C45 Cortical Hemodynamics and Neural Network Connectivity During Stuttered and Fluent Speech**

Allison S. Hancock<sup>1</sup>, Nick Wan<sup>1,2</sup>, Sushma Alphonsa<sup>1</sup>, Sandra L. Gillam<sup>1</sup>, Ronald B. Gillam<sup>1</sup>; <sup>1</sup>Utah State University, <sup>2</sup>Cincinnati Reds  
Topic Area: LANGUAGE: Other

**Poster C46 Knowledge Structure and Expository Texts Comprehension: A Neurocognitive Study**

Chun-Ting Hsu<sup>1</sup>, Roy Clariana<sup>1</sup>, Ping Li<sup>1</sup>; <sup>1</sup>Pennsylvania State University  
Topic Area: LANGUAGE: Other

**Poster C47 Common recruitment of neural resources for phonological working memory regardless of behavioral demands.**

Terri L. Scott<sup>1</sup>, Sara C. Dougherty<sup>1</sup>, Ja Young Choi<sup>2</sup>, Tyler K. Perrachione<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>Harvard University  
Topic Area: LANGUAGE: Other

**Poster C48 Implicit Learning of Adjacent and Non-Adjacent Dependencies: Relationships with Measures of Language, Attention, and Working Memory**

Joanne A. Deocampo<sup>1</sup>, Tricia Z. King<sup>1</sup>, Christopher M. Conway<sup>1</sup>; <sup>1</sup>Georgia State University  
Topic Area: LANGUAGE: Other

**Poster C49 Psychoeducational outcomes in children following left or right hemispherectomy**

Kelly Halverson<sup>1</sup>, Olivia Meegoda<sup>2</sup>, Heather Beckius<sup>2</sup>, Andrea Imhof<sup>2</sup>, Stella deBode<sup>3</sup>, Tami Katzir<sup>4</sup>, Joanna A. Christodoulou<sup>2</sup>; <sup>1</sup>University of Houston, <sup>2</sup>MGH Institute of Health Professions, <sup>3</sup>CTC Widney, Los Angeles, CA, <sup>4</sup>University of Haifa  
Topic Area: LANGUAGE: Other

**Poster C50 Catching a Snitch vs. catching a Bludger: Variability in world knowledge influences real-time access to word meaning**

Melissa Troyer<sup>1</sup>, Marta Kutas<sup>1</sup>; <sup>1</sup>University of California, San Diego  
Topic Area: LANGUAGE: Semantic

**Poster C51 Predicting Conceptual Change during Naturalistic Reading with fMRI**

Benjamin Schloss<sup>1</sup>, Ping Li<sup>1</sup>; <sup>1</sup>The Pennsylvania State University  
Topic Area: LANGUAGE: Semantic

**Poster C52 Alpha- and theta-band time-frequency representations in free reading of stories using EEG and EM coregistration**

Max Cantor<sup>1</sup>, John Trueswell<sup>2</sup>, Albert Kim<sup>1</sup>; <sup>1</sup>University of Colorado Boulder, <sup>2</sup>University of Pennsylvania  
Topic Area: LANGUAGE: Semantic

**The neural substrates for predictive processes in sentence comprehension**

**Poster C53**

Chih-Ting Chang<sup>1</sup>, Ping Li<sup>2,3</sup>, Jie-Li Tsai<sup>4</sup>, En-Ju Lin<sup>5</sup>, Pei-Chun Chao<sup>1</sup>, Chia-Ju Chou<sup>1</sup>, Chia-Ying Lee<sup>1,4,5,6</sup>; <sup>1</sup>Institute of Neuroscience, National Yang-Ming University, Taipei, Taiwan, <sup>2</sup>Department of Psychology, Pennsylvania State University, University Park, PA, USA, <sup>3</sup>Center for Brain, Behavior, and Cognition, Pennsylvania State University, University Park, PA, USA, <sup>4</sup>Department of Psychology, National Chengchi University, Taiwan, <sup>5</sup>Institute of Linguistics, Academia Sinica, Taipei, Taiwan, <sup>6</sup>Institute of Cognitive Neuroscience, National Central University, Taipei, Taiwan  
Topic Area: LANGUAGE: Semantic

**Poster C54 The Effects of Age and Familial Sinistrality on Late Positive Components**

Michelle Leckey<sup>1</sup>, Kara D. Federmeier<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign  
Topic Area: LANGUAGE: Syntax

**Poster C55 Dissociating the Effect of Dependency from Embedding in Syntactic Hierarchy**

Kyung-Hwan Cheon<sup>1</sup>, Hee-Dong Yoon<sup>1</sup>, Hyeon-Ae Jeon<sup>1,2</sup>; <sup>1</sup>Department of Brain and Cognitive Sciences, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Daegu, Korea, <sup>2</sup>Partner Group of the Max Planck Institute for Human Cognitive and Brain Sciences at the Department of Brain and Cognitive Sciences, DGIST, Daegu, Korea  
Topic Area: LANGUAGE: Syntax

**Poster C56 Age differences in memory retrieval: The role of regulatory downregulation of medial temporal lobe activity by the prefrontal cortex**

Jaclyn Ford<sup>1</sup>, Elizabeth Kensinger<sup>1</sup>; <sup>1</sup>Boston College

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster C57 Investigating neural effects of memory training to reduce false memories in older adults**

Indira Turney<sup>1</sup>, Jonathan G. Hakun<sup>1</sup>, Brenda A. Kirchhoff<sup>2</sup>, Nancy A. Dennis<sup>1</sup>; <sup>1</sup>Pennsylvania State University, <sup>2</sup>Saint Louis University

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster C58 Phenotypic expression of presenilin 1 p.Gly206Ala autosomal dominant Alzheimer's disease**

Evin Bender<sup>1</sup>, Maya Lichtenstein<sup>1</sup>; <sup>1</sup>Geisinger Health System

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster C59 Definition-based unitization improves associative memory of older adults: mechanism and training studies**

Juan Li<sup>1</sup>, Baoxi Wang<sup>1</sup>, Zhiwei Zheng<sup>1</sup>; <sup>1</sup>Institute of Psychology, Chinese Academy of Sciences, Beijing 100101, China

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster C60 THC disrupts the encoding of perceptual details while sparing item-context bindings.**

Manoj Doss<sup>1</sup>, Jessica Weafer<sup>1</sup>, David Gallo<sup>1</sup>, Harriet de Wit<sup>1</sup>; <sup>1</sup>University of Chicago

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C61 Hippocampal damage impairs creativity in conceptual combination**

Heather D. Lucas<sup>1</sup>, Mahima Goel<sup>2</sup>, Kara D. Federmeier<sup>2</sup>, Melissa C. Duff<sup>3</sup>, Neal J. Cohen<sup>2</sup>; <sup>1</sup>Louisiana State University, <sup>2</sup>University of Illinois Urbana-Champaign, <sup>3</sup>Vanderbilt University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C62 Building and accessing a compressed internal timeline of the future**

Inder Singh<sup>1,2</sup>, Marc Howard<sup>2</sup>; <sup>1</sup>Northeastern University, <sup>2</sup>Boston University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C63 Neural representations of temporal statistics can predict subsequent reasoning**

Athula Pudhidiyath<sup>1</sup>, Anna C. Schapiro<sup>2</sup>, Alison R. Preston<sup>1</sup>; <sup>1</sup>The University of Texas at Austin, <sup>2</sup>Harvard Medical School

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C64 Episodic Memory Training Induces Functional Plasticity in PFC – Hippocampal Neural Circuitry**

Farah Naaz<sup>1</sup>, Lindsay Knight<sup>1</sup>, Teodora Stoica<sup>1</sup>, Brendan Depue<sup>1</sup>; <sup>1</sup>University of Louisville

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C65 Memory for stereotype-consistent and stereotype-inconsistent information is supported by distinct brain regions**

Niv Reggev<sup>1</sup>, Jason Mitchell<sup>1</sup>; <sup>1</sup>Harvard University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C66 Biasing Memory Replay During Sleep: A Quantitative Synthesis of Targeted Memory Reactivation Effects**

Xiaoqing Hu<sup>1</sup>, Larry Y. Cheng<sup>2</sup>, Ken A. Paller<sup>2</sup>; <sup>1</sup>The University of Hong Kong, <sup>2</sup>Northwestern University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C67 Effect of Congruency Between Encoding and Retrieval on Associative Retrieval**

Courtney R. Gray<sup>1</sup>, M. Andrew Rowley<sup>2</sup>, Kayla McGraw<sup>2</sup>, Alexandra P. Giglio<sup>2</sup>, Joanna M. Salerno<sup>2</sup>, Amy A. Overman<sup>2</sup>, Nancy A. Dennis<sup>1</sup>; <sup>1</sup>The Pennsylvania State University, <sup>2</sup>Elon University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C68 Comparing and contrasting the neural mechanisms of autobiographical memory and problem solving**

Sarah L. Peters<sup>1</sup>, Carina L. Fan<sup>1</sup>; <sup>1</sup>McGill University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C69 Hippocampal theta-gamma coupling predicts associative memory performance as measured by chronic ambulatory electrocorticography**

Anita Shankar<sup>1</sup>, Simon Henin<sup>1</sup>, Daniel Friedman<sup>1</sup>, Patricia Dugan<sup>1</sup>, Lucia Melloni<sup>1,2</sup>, Werner Doyle<sup>1</sup>, Lila Davachi<sup>3</sup>, Anli Liu<sup>1</sup>; <sup>1</sup>New York University School of Medicine, <sup>2</sup>Max Planck Institute for Brain Research, <sup>3</sup>Columbia University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C70 Cortical oscillations underlying strict and lax decision criteria in recognition memory**

Charlie Nettles<sup>1</sup>, Evan Layher<sup>2</sup>, Justin Kantner<sup>1</sup>, Michael B. Miller<sup>2</sup>;

<sup>1</sup>California State University, Northridge, <sup>2</sup>University of California, Santa Barbara

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C71 Theta oscillations increase at critical junctures of overlapping mazes**

Justine Cohen<sup>1</sup>, Chantal E. Stern<sup>1</sup>; <sup>1</sup>Boston University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster C72 Retrieval-induced forgetting and second language acquisition: Preliminary insights from a Welsh language word-learning study**

Lyam Bailey<sup>1</sup>, Aaron J. Newman<sup>1</sup>; <sup>1</sup>Dalhousie University

Topic Area: LONG-TERM MEMORY: Other

**Poster C73 A direct pathway to anterior IPS for graspable objects: fMRI evidence from a patient with a lesion to the geniculostriate pathway**

Quanjin Chen<sup>1</sup>, Colleen Schneider<sup>1,2</sup>, Emily Prentiss<sup>1</sup>, Zoe Williams<sup>3</sup>, Bogachan Sahin<sup>4</sup>, Bradford Z. Mahon<sup>1,4,5,6</sup>; <sup>1</sup>Department of Brain and Cognitive Sciences, University of Rochester, <sup>2</sup>Medical Scientist Training Program, University of Rochester School of Medicine and Dentistry, <sup>3</sup>Department of Ophthalmology, University of Rochester School of Medicine and Dentistry, <sup>4</sup>Department of Neurology, University of Rochester School of Medicine and Dentistry, <sup>5</sup>Department of Neurosurgery, University of Rochester School of Medicine and Dentistry, <sup>6</sup>Center for Visual Science, University of Rochester

Topic Area: LONG-TERM MEMORY: Semantic

**Poster C74 Searching for semantic knowledge: A vector space semantic analysis of the feature generation task**

Rebecca Cutler<sup>1</sup>, Nate Klooster<sup>2</sup>, Melissa Duff<sup>1</sup>, Sean Polyn<sup>1</sup>; <sup>1</sup>Vanderbilt University, <sup>2</sup>University of Pennsylvania

Topic Area: LONG-TERM MEMORY: Semantic

**Poster C75            The Impact of Acetylcholine Blockade on Declarative and Motor Memory Consolidation Following a Night of Sleep or a Day of Wake**

Matthew Tucker<sup>1</sup>, Kathryn Taylor<sup>1</sup>, Rozina Merchant<sup>1</sup>, Sharon George<sup>1</sup>, Caroline Stoddard<sup>1</sup>, Kevin Kopera<sup>1</sup>; <sup>1</sup>University of South Carolina School of Medicine Greenville

Topic Area: LONG-TERM MEMORY: Semantic

**Poster C76            Finding the baby in the bath water – evidence for training-specific changes in MRI measures of brain structure and function**

Cibu Thomas<sup>1</sup>, Adam Steel<sup>1</sup>, Aaron Trefler<sup>1</sup>, Elizabeth Aguila<sup>1</sup>, Gang Chen<sup>1</sup>, Carlo Pierpaoli<sup>2</sup>, Chris Baker<sup>1</sup>; <sup>1</sup>National Institute of Mental Health, <sup>2</sup>National Institute of Biomedical Imaging and Bioengineering

Topic Area: LONG-TERM MEMORY: Skill learning

**Poster C77            EEG patterns reveal internal dynamics of sleep stage N3**

Achim Schilling<sup>1</sup>, Patrick Krauss<sup>1</sup>, Konstantin Tziridis<sup>1</sup>, Maximilian Traxdorf<sup>2</sup>, Holger Schulze<sup>1</sup>; <sup>1</sup>Experimental Otolaryngology University of Erlangen-Nuremberg, <sup>2</sup>Department of Otolaryngology University of Erlangen-Nuremberg

Topic Area: METHODS: Electrophysiology

**Poster C78            Test-retest reliability of ERP based Neurometrics**

Rachel Scrivano<sup>1</sup>, James Cole<sup>1</sup>, Paul Kieffaber<sup>1</sup>; <sup>1</sup>College of William and Mary

Topic Area: METHODS: Electrophysiology

**Poster C79            Neural correlates underlying statistical learning of adjacent and non-adjacent verbal sequential dependencies**

Leyla Eghbalzad<sup>1</sup>, Joanne A. Deocampo<sup>1</sup>, Gretchen N.L. Smith<sup>2</sup>, Sabrina Na<sup>1</sup>, Tricia Z. King<sup>1</sup>, Christopher M. Conway<sup>1</sup>; <sup>1</sup>Georgia State University, <sup>2</sup>Indiana University School of Medicine

Topic Area: METHODS: Neuroimaging

**Poster C80            Reduced Persistence of Spontaneous Brain Activity in Schizophrenia**

Huang Zheng<sup>1,2</sup>, Jianbo Gao<sup>1,2</sup>; <sup>1</sup>School of Computer, Electronics and Information, Guangxi University, China, <sup>2</sup>Institute of Complexity Science and Big Data Technology, Guangxi University, China

Topic Area: METHODS: Neuroimaging

**Poster C81            A Novel Information Network Flow Approach for Measuring Functional Connectivity and Predicting Behavior**

Sreejan Kumar<sup>1</sup>, Kwangsun Yoo<sup>1</sup>, Monica D. Rosenberg<sup>1</sup>, Marvin M. Chun<sup>1</sup>; <sup>1</sup>Yale University

Topic Area: METHODS: Neuroimaging

**Poster C82            Quasi-Periodic Patterns of Intrinsic Brain Activity: Stability and Individual-Specificity**

Behnaz Yousefi<sup>1</sup>, Eric Schumacher<sup>2</sup>, Shella Keilholz<sup>1</sup>; <sup>1</sup>School of Biomedical Engineering, Emory University/Georgia Institute of Technology, Atlanta, GA, USA, <sup>2</sup>School of Psychology, Georgia Institute of Technology

Topic Area: METHODS: Neuroimaging

**Poster C83            The Fronto-Insular Cortex Causally Mediates the Default-Mode and Central-Executive Networks to Contribute to Individual Cognitive Performance**

Rui Li<sup>1,2</sup>, Juan Li<sup>1,2</sup>; <sup>1</sup>CAS Key Laboratory of Mental Health, Institute of Psychology, <sup>2</sup>University of Chinese Academy of Sciences

Topic Area: METHODS: Neuroimaging

**Poster C84            Defining Cognition: Automated Generation of Cognitive Ontology by Text-Mining Literature**

Richard Gao<sup>1</sup>, Thomas Donoghue<sup>1</sup>, Bradley Voytek<sup>1</sup>; <sup>1</sup>University of California, San Diego

Topic Area: METHODS: Other

**Poster C85            The role of physical fitness components on overall and regional cortical thickness in overweight/obese children: preliminary results from the ActiveBrains Project**

Irene Esteban-Cornejo<sup>1,2</sup>, Jose Mora-González<sup>1</sup>, Cristina Cadenas-Sánchez<sup>1</sup>, Oren Contreras-Rodriguez<sup>3,4</sup>, Juan Verdejo-Roman<sup>5</sup>, Pontus Henriksson<sup>1,6</sup>, Jairo Migueles<sup>1</sup>, Maria Rodriguez-Ayllon<sup>1</sup>, Pablo Molina-García<sup>1</sup>, Charles Hillman<sup>2</sup>, Andrés Catena<sup>5</sup>, Francisco B. Ortega<sup>1</sup>; <sup>1</sup>PROFITH “PRoMoting FITness and Health through physical activity” research group, University of Granada, Granada, Spain, <sup>2</sup>Northeastern University, Boston, MA, <sup>3</sup>Bellvitge Biomedical Research Institute-IDIBELL, Barcelona, Spain., <sup>4</sup>Centro de Investigacion Biomedica en Red de Salud Mental (CIBERSAM), Barcelona, Spain., <sup>5</sup>Mind, Brain and Behavior Research Center (CIMCYC), University of Granada, Granada, Spain., <sup>6</sup>Karolinska Institutet, Huddinge, Sweden.

Topic Area: NEUROANATOMY

**Poster C86            Adding insult to injury: Effects of cranial radiation treatment on structural volumes and associated memory performance in brain tumour survivors**

Ramy Ayoub<sup>1,2</sup>, Kiran Beera<sup>1</sup>, Ashley Ferkul<sup>1</sup>, Jovanka Skocic<sup>1</sup>, Cynthia de Medeiros<sup>1</sup>, Eric Bouffet<sup>1,2</sup>, Donald Mabbott<sup>1,2</sup>; <sup>1</sup>Peter Gilgan Center for Research and Learning, The Hospital for Sick Children, <sup>2</sup>University of Toronto

Topic Area: NEUROANATOMY

**Poster C87            Concurrent temporal channels for auditory processing: behavioral and neurophysiological evidence reveals segregation of function at different scales**

Xiangbin Teng<sup>1</sup>, David Poeppel<sup>1,2</sup>; <sup>1</sup>Max Planck Institute, Frankfurt, Germany, <sup>2</sup>Department of Psychology, New York University, New York, NY

Topic Area: PERCEPTION & ACTION: Audition

**Poster C88            Effect of listening environment on cortical entrainment to continuous speech in older adults**

Jacie R. McHaney<sup>1</sup>, Benjamin D. Zinszer<sup>1</sup>, Kirsten E. Smayda<sup>1</sup>, Bharath Chandrasekaran<sup>1</sup>; <sup>1</sup>The University of Texas at Austin

Topic Area: PERCEPTION & ACTION: Audition

**Poster C89            Abnormal resting-state EEG cross-frequency coupling in patients with tinnitus**

Byoung-Kyong Min<sup>1</sup>, Min-Hee Ahn<sup>1</sup>, Sung Kwang Hong<sup>1,2</sup>; <sup>1</sup>Korea University, <sup>2</sup>Hallym University College of Medicine

Topic Area: PERCEPTION & ACTION: Audition

**Poster C90**      **Tablet-based gameplay identifies movement patterns related to autism spectrum disorder**

Anna Anzulewicz<sup>1,2,3</sup>, Krzysztof Sobota<sup>2,3</sup>, Jonathan Delafield-Butt<sup>2</sup>;  
<sup>1</sup>Jagiellonian University in Krakow, Poland, <sup>2</sup>University of Strathclyde, Glasgow, UK, <sup>3</sup>Harimata, Krakow, Poland  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster C91**      **Age-related declines in GABA levels in the auditory cortex are associated with neural distinctiveness and auditory perception.**

Poortata S. Lalwani<sup>1</sup>, Holly Gagnon<sup>1</sup>, Kaitlin Cassady<sup>1</sup>, Molly Simmonite<sup>1</sup>, Myria Petrou<sup>1</sup>, Bradley Foerster<sup>1</sup>, Rachael Seidler<sup>2</sup>, Stephan Taylor<sup>1</sup>, Daniel H. Weissman<sup>1</sup>, Thad A. Polk<sup>1</sup>; <sup>1</sup>University of Michigan, <sup>2</sup>University of Florida  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster C92**      **Grasping Interferes with Visuospatial Working Memory during the Encoding: Neurophysiological Evidence**

Rumeysa Gunduz Can<sup>1,2</sup>, Thomas Schack<sup>1,2,3</sup>, Dirk Koester<sup>1,2</sup>; <sup>1</sup>Faculty of Psychology and Sport Science, Bielefeld University, Germany, <sup>2</sup>Cognitive Interaction Technology - Center of Excellence, Bielefeld University, Germany, <sup>3</sup>Research Institute for Cognition and Robotics, Bielefeld University, Germany  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster C93**      **Comparing Sensorimotor Oscillations during a Motor Task with a Robot or Human Partner**

Nathan Smyk<sup>1</sup>, Staci Meredith Weiss<sup>1</sup>, Jebediah Taylor<sup>1</sup>, Peter Marshall<sup>1</sup>;  
<sup>1</sup>Temple University  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster C94**      **Dynamic shaping of the defensive peripersonal space through kinesthetic illusion**

Monica Biggio<sup>1</sup>, Ambra Bisio<sup>1</sup>, Piero Ruggeri<sup>1</sup>, Marco Bove<sup>1</sup>; <sup>1</sup>University of Genoa, Italy  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster C95**      **Cortico-Cerebellar Pathways for Understanding Language Coordination**

Magda L. Dumitru<sup>1</sup>, Laurens Van Calster<sup>1</sup>, Marion Bouffier<sup>1</sup>, Steve Majors<sup>1</sup>;  
<sup>1</sup>University of Liege  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster C96**      **Synesthesia and Statistical Learning: Redundant Cues Improve Segmentation**

Tess Allegra Forest<sup>1</sup>, Alessandra Lichtenfeld<sup>2</sup>, Bryan Alvarez<sup>2</sup>, Amy Finn<sup>1</sup>;  
<sup>1</sup>University of Toronto, <sup>2</sup>University of California, Berkeley  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster C97**      **Changes in perceived peripersonal space following the rubber hand illusion**

Miranda Smit<sup>1</sup>, Veerle Kurstjens<sup>1</sup>, Chris Dijkerman<sup>1</sup>, Ineke van der Ham<sup>2</sup>, Maarten van der Smagt<sup>1</sup>; <sup>1</sup>Utrecht University, Department of Experimental Psychology, Helmholtz Institute, Utrecht, The Netherlands, <sup>2</sup>Department of Health, Medical, and Neuropsychology, Leiden University, the Netherlands  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster C98**      **Everyday taxi drivers: Do gifted navigators have larger hippocampi?**

Steven Weisberg<sup>1</sup>, Nora Newcombe<sup>2</sup>, Anjan Chatterjee<sup>1</sup>; <sup>1</sup>University of Pennsylvania, <sup>2</sup>Temple University  
Topic Area: PERCEPTION & ACTION: Other

**Poster C99**      **Fast fMRI with simultaneous EEG detects distinct thalamocortical dynamics underlying transitions in and out of sleep**

Laura Lewis<sup>1,2</sup>, Jonathan Polimeni<sup>2,3</sup>, Kavin Setsompop<sup>2,3</sup>, Robert Stickgold<sup>4</sup>, Giorgio Bonmassar<sup>2,3</sup>, Bruce Rosen<sup>2,3</sup>; <sup>1</sup>Harvard University, <sup>2</sup>Massachusetts General Hospital, <sup>3</sup>Harvard Medical School, <sup>4</sup>Beth Israel Deaconess Medical Center  
Topic Area: PERCEPTION & ACTION: Other

**Poster C100**      **Consecutive TBS-fMRI on scene-selective cortex reveals non-specific effects in high-level visual cortex**

Edward Silson<sup>1</sup>, Iris Groen<sup>1</sup>, Chris Baker<sup>1</sup>; <sup>1</sup>Laboratory of Brain & Cognition, NIMH, NIH  
Topic Area: PERCEPTION & ACTION: Vision

**Poster C101**      **Perceptual and conceptual dimensions impacting animate items in the human ventral stream**

Griffin E. Koch<sup>1</sup>, Marc N. Coutanche<sup>1</sup>; <sup>1</sup>University of Pittsburgh  
Topic Area: PERCEPTION & ACTION: Vision

**Poster C102**      **A Number Signal in Early Visual Cortex**

Nicholas DeWind<sup>1</sup>, Joonkoo Park<sup>2</sup>, Marty Woldorff<sup>3</sup>, Elizabeth Brannon<sup>1</sup>;  
<sup>1</sup>University of Pennsylvania, <sup>2</sup>University of Massachusetts Amherst, <sup>3</sup>Duke University  
Topic Area: PERCEPTION & ACTION: Vision

**Poster C103**      **Ultra-rapid Serial Visual Presentation of Images Reveals Unconscious Perceptual Neural Signature of Memorability**

Yalda Mohsenzadeh<sup>1</sup>, Aude Oliva<sup>1</sup>, Dimitrios Pantazis<sup>1</sup>; <sup>1</sup>MIT  
Topic Area: PERCEPTION & ACTION: Vision

**Poster C104**      **tDCS-induced hemispheric asymmetry alters belief updating**

Nikki Marinsek<sup>1</sup>, Michael B. Miller<sup>1</sup>; <sup>1</sup>University of California, Santa Barbara  
Topic Area: THINKING: Decision making

**Poster C105**      **Are you thinking what I'm thinking? Theory of Mind activation in social dilemmas**

Justin M. Campbell<sup>1</sup>, Nick Wan<sup>1,2</sup>, Bradley Robinson<sup>1</sup>, Kerry Jordan<sup>1</sup>; <sup>1</sup>Utah State University, <sup>2</sup>Cincinnati Reds  
Topic Area: THINKING: Decision making

**Poster C106**      **Identifying inter-relations between genetic polymorphisms and reinforcement learning: multivariate insights from behavior and computational modeling**

Carrisa Cocuzza<sup>1</sup>, Jim Cavanagh<sup>2</sup>, Michael Cole<sup>1</sup>, Travis Baker<sup>1</sup>; <sup>1</sup>Rutgers University, <sup>2</sup>University of New Mexico  
Topic Area: THINKING: Decision making

**Poster C107**      **Seeing the forest or the trees? Evidence for differential information-seeking and updating in obsessive-compulsive patients and healthy controls**

Andra Geana<sup>1</sup>, Christina L. Boisseau<sup>1,2</sup>, Steven Rasmussen<sup>1,2</sup>, Brianna Pritchett<sup>1,2</sup>, Michael J. Frank<sup>1</sup>; <sup>1</sup>Brown University, <sup>2</sup>Butler Hospital  
Topic Area: THINKING: Decision making

**Poster C108 Integrating incomplete information with imperfect advice**

Natalia Véllez<sup>1</sup>, Sajjad Torabian<sup>1</sup>, Hyowon Gweon<sup>1</sup>; <sup>1</sup>Stanford University  
Topic Area: THINKING: Decision making

**Poster C109 Everything you can imagine is real: Component processes and brain systems of imagination.**

Darya Zabelina<sup>1</sup>, Jessica Andrews-Hanna<sup>2</sup>; <sup>1</sup>University of Arkansas,  
<sup>2</sup>University of Arizona  
Topic Area: THINKING: Other

**Poster C110 Increasing salience of competitors increases selective visual attention and induces more analytic problem solving**

Tiffani Ng<sup>1</sup>, Mark Beeman<sup>1</sup>; <sup>1</sup>Northwestern University  
Topic Area: THINKING: Problem solving

**Poster C111 Individual differences in IPS and PFC function predict fraction knowledge in children**

Priya B. Kalra<sup>1</sup>, John V. Binzak<sup>1</sup>, Yunji Park<sup>1</sup>, Elizabeth Y. Toomarian<sup>1</sup>, Percival G. Matthews<sup>1</sup>, Edward M. Hubbard<sup>1</sup>; <sup>1</sup>University of Wisconsin--Madison  
Topic Area: THINKING: Reasoning

**Poster C112 Collective Creativity: Exploring the Existence of Group-Level Creativity in Collaborative Teams**

Adam Weinberger<sup>1</sup>, Natalie Gallagher<sup>2</sup>, Nhi Dinh<sup>1</sup>, Adam Green<sup>1</sup>;  
<sup>1</sup>Georgetown University, <sup>2</sup>Northwestern University  
Topic Area: THINKING: Reasoning

**Poster C113 Understanding the neural mechanism by which neurostimulation drives visual working memory: An inside view of neurostimulation decay**

Hector Arciniega<sup>1</sup>, Marian Berryhill<sup>1</sup>; <sup>1</sup>University of Nevada, Reno  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C114 Suppressing lateral orbitofronto-striatal pathway improved the learning of delayed paired associative learning task in mice**

Cheng Qi<sup>1,2</sup>, Hou Rui Qing<sup>1</sup>, Chen Zhao Qin<sup>1</sup>, Fan Hong Mei<sup>1</sup>, T. Li Chengyu<sup>1</sup>; <sup>1</sup>Institute of Neuroscience and Key Laboratory of Primate Neurobiology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai 200031, China, <sup>2</sup>University of Chinese Academy of Sciences, Beijing 100049, China.  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C115 Alpha Oscillatory Synchrony underlying Working Memory Maintenance in Children**

Julie Sato<sup>1,2</sup>, Sarah Mossad<sup>1,2</sup>, Simeon Wong<sup>2</sup>, Benjamin Hunt<sup>2</sup>, Benjamin Dunkley<sup>1,2</sup>, Mary Lou Smith<sup>1,2</sup>, Margot Taylor<sup>1,2</sup>; <sup>1</sup>The Hospital for Sick Children, <sup>2</sup>University of Toronto  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C117 Are unattended memory items under cognitive control?**

Jacqueline Fulvio<sup>1</sup>, Bradley Postle<sup>1</sup>; <sup>1</sup>University of Wisconsin - Madison  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster C118 Development of Spoken Language Comprehension in Hearing Children and Children with Cochlear Implants: Data from a Passive Listening Task**

Sharon Coffey-Corina<sup>1</sup>, Kristina Backer<sup>1</sup>, Laurie lawyer<sup>3</sup>, Andrew Kessler<sup>2</sup>, Lee Miller<sup>1</sup>, David Corina<sup>1</sup>; <sup>1</sup>University of California, Davis, Center for Mind and Brain, <sup>2</sup>University of Washington, Seattle, WA, <sup>3</sup>University of Essex, U.K.  
Topic Area: LANGUAGE: Development & aging

**Poster C119 Relationships between Cortical Thickness and Reading in Typically Developing Children**

Gabrielle-Ann Torre<sup>1,2</sup>, Guinevere Eden<sup>1</sup>; <sup>1</sup>Center for the Study of Learning, Georgetown University, Washington, DC, <sup>2</sup>Interdisciplinary Program in Neuroscience, Georgetown University, Washington, DC  
Topic Area: LANGUAGE: Development & aging

**Poster C120 The Interhemispheric Relationship Between Chaos and Rigidity in Processing Global and Local Textual Information**

Scott Wittman<sup>1</sup>, Shelby Smith<sup>1</sup>, Kristin Ritchey<sup>1</sup>, Caleb Robinson<sup>1</sup>, April Mullen<sup>1</sup>, Charles Jackson<sup>1</sup>, Stephanie Simon-Dack<sup>1</sup>; <sup>1</sup>Ball State University  
Topic Area: LANGUAGE: Lexicon

**Poster C122 Brain responses to morphologically complex words: an electrophysiological study on Swedish past tense forms**

Andrea Schremm<sup>1</sup>, Mikael Novén<sup>1</sup>, Merle Horne<sup>1</sup>, Mikael Roll<sup>1</sup>; <sup>1</sup>Lund University, Sweden  
Topic Area: LANGUAGE: Other

**Poster C123 Emotional prosody modulates neural sensitivity to speech discrimination**

Yang Zhang<sup>1</sup>, Chieh Kao<sup>1</sup>, Erin Diamond<sup>2</sup>; <sup>1</sup>University of Minnesota, <sup>2</sup>North Memorial Health Care  
Topic Area: LANGUAGE: Other

**Poster C124 Improved diffusion Magnetic Resonance Imaging reconstruction of the Arcuate Fasciculus**

Elise B. Barbeau<sup>1,2,3</sup>, Kaija Sander<sup>1,2,3</sup>, Shanna Kousaie<sup>1,3</sup>, Thomas Liotis<sup>3</sup>, Denise Klein<sup>1,2,3</sup>, Michael Petrides<sup>1,2,4</sup>; <sup>1</sup>Cognitive Neuroscience Unit, Montreal Neurological Institute, McGill University, <sup>2</sup>Department of Neurology and Neurosurgery, McGill University, <sup>3</sup>Center for Research on Brain, Language and Music (CRBLM), Montreal, <sup>4</sup>Department of Psychology, McGill University

**Topic Area: LANGUAGE: Other**

**Poster C125 Indirect impact of a foreign accent on cognitive processes with no spoken language.**

Alice Foucart<sup>1</sup>, Hernando Santamaría-García<sup>2,3,4</sup>, Robert Hartsuiker<sup>1</sup>; <sup>1</sup>Ghent University, Belgium, <sup>2</sup>Pontificia Universidad Javeriana, Colombia, <sup>3</sup>Instituto de Neurociencia Cognitiva y Traslacional, Argentina, <sup>4</sup>Centro de memoria y cognición intellectus hospital san Ignacio, Argentina  
Topic Area: LANGUAGE: Other

**Poster C126**      **Convergence of speech-print networks as a marker of language learning**

Pedro M. Paz-Alonso<sup>1</sup>, Kshipra Gurunandan<sup>1</sup>, Manuel Carreiras<sup>1,2</sup>; <sup>1</sup>BCBL. Basque Center on Cognition, Brain and Language, <sup>2</sup>Ikerbasque. Basque Foundation for Science  
Topic Area: LANGUAGE: Semantic

**Poster C127**      **Instantiating new objects into the discourse: the role of hippocampus and prefrontal cortex**

Zachary Ekves<sup>1,2</sup>, Pedro Paz-Alonso<sup>3</sup>, Nicholas Hindy<sup>4</sup>, Sarah Solomon<sup>5</sup>, Gerry Altmann<sup>1,2</sup>; <sup>1</sup>University of Connecticut, <sup>2</sup>Connecticut Institute for the Brain and Cognitive Sciences, <sup>3</sup>Basque Center on Cognition, Brain, and Language, <sup>4</sup>University of Louisville, <sup>5</sup>University of Pennsylvania  
Topic Area: LANGUAGE: Semantic

**Poster C128**      **Context modulates figurative language deficits**

Madhushree Chakrabarty<sup>1</sup>, Eileen Cardillo<sup>1</sup>, Anjan Chatterjee<sup>1</sup>; <sup>1</sup>University of Pennsylvania  
Topic Area: LANGUAGE: Semantic

**Poster C129**      **Discrimination and Prediction of Concreteness from Neuroimaging and Corpus Data**

Dominick DiMercurio<sup>1</sup>, Chaleece Sandberg<sup>1</sup>; <sup>1</sup>Pennsylvania State University  
Topic Area: LANGUAGE: Semantic

**Poster C130**      **Top-down prediction and semantic facilitation in schizophrenia**

Victoria Sharpe<sup>1</sup>, Ellen Lau<sup>2</sup>, Nate Delaney-Busch<sup>1</sup>, Kirsten Weber<sup>3</sup>, Lin Wang<sup>1</sup>, Gina Kuperberg<sup>1,4</sup>; <sup>1</sup>Tufts University, <sup>2</sup>University of Maryland, <sup>3</sup>Max Planck Institute for Psycholinguistics, <sup>4</sup>Massachusetts General Hospital  
Topic Area: LANGUAGE: Semantic

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## Poster Session D

Monday, March 26, 8:00-10:00 am

**Poster D1**      **Acoustic Effects on Oscillatory Markers of Sustained Attention**

Psyche Loui<sup>1</sup>, Emily Przysinda<sup>1</sup>, Gonçalo Sampaio<sup>1</sup>, Tedra James<sup>1</sup>, Adam Hewett<sup>2</sup>, Benjamin Morillon<sup>3</sup>, Kevin Woods<sup>4</sup>; <sup>1</sup>Wesleyan University, <sup>2</sup>Transparent Corp, <sup>3</sup>Aix Marseille University, <sup>4</sup>Massachusetts Institute of Technology  
Topic Area: ATTENTION: Auditory

**Poster D3**      **Hemispheric asymmetries in behavioral and EEG measures of visual short-term memory change with aging**

Iris Wiegand<sup>1,2,3</sup>, Patrizia Maier<sup>2</sup>, Natan Napiórkowski<sup>4</sup>, Kathrin Finke<sup>4,5</sup>, Thomas Töllner<sup>4</sup>, Hermann J Müller<sup>4</sup>, Myriam C Sander<sup>2</sup>; <sup>1</sup>Harvard University, <sup>2</sup>Max Planck Institute for Human Development, <sup>3</sup>Max Planck UCL Centre for Computational Psychiatry and Ageing Research, <sup>4</sup>LMU Munich, <sup>5</sup>Jena University Hospital  
Topic Area: ATTENTION: Development & aging

**Poster D4**      **The neural dynamics underlying unconstrained visuo-spatial and auditory mental imagery**

Lizzy Blundon<sup>1</sup>, Yana Pertels<sup>1</sup>, Lawrence Ward<sup>1,2</sup>; <sup>1</sup>University of British Columbia, <sup>2</sup>Brain Research Centre  
Topic Area: ATTENTION: Multisensory

**Poster D5**      **Differential effects of phasic and tonic alerting on conflict resolution. Evidence from human electrophysiology.**

Dariusz Asanowicz<sup>1</sup>, Mikolaj Compa<sup>1</sup>; <sup>1</sup>Jagiellonian University in Kraków, Poland  
Topic Area: ATTENTION: Nonspatial

**Poster D6**      **Comparing objective and subjective measures of inattention that predict forgetting**

McKinzey Torrance<sup>1</sup>, Barry Eom<sup>1</sup>, David DiStefano<sup>1</sup>, Elizabeth Race<sup>1</sup>; <sup>1</sup>Tufts University  
Topic Area: ATTENTION: Other

**Poster D7**      **The effect of cognitive load on conscious access to visual sensory inputs across tasks of varying precision**

Moriah Stendel<sup>1</sup>, Mathieu Landry<sup>1</sup>, David Milton<sup>1</sup>, Amir Raz<sup>1,2</sup>; <sup>1</sup>McGill University, <sup>2</sup>Lady Davis Research Institute, Jewish General Hospital  
Topic Area: ATTENTION: Other

**Poster D8**      **Testing the Assumptions of the Thought Probe Method in Mind Wandering**

Jennifer Yip<sup>1</sup>, Julia Kam<sup>2</sup>, Todd Handy<sup>1</sup>; <sup>1</sup>University of British Columbia, <sup>2</sup>University of California - Berkeley  
Topic Area: ATTENTION: Other

**Poster D9**      **Alpha Power and 1/f Slope Provide Independent Decoding of Visual Spatial Attention**

Thomas Donoghue<sup>1</sup>, Bradley Voytek<sup>1</sup>; <sup>1</sup>University of California, San Diego (UCSD)  
Topic Area: ATTENTION: Spatial

**Poster D10**      **Truly Independent! Typologies of Attention at Different Levels of Processing**

Mathieu Landry<sup>1</sup>, Jason Da Silva Castanheira<sup>1</sup>, Amir Raz<sup>1,2</sup>; <sup>1</sup>McGill University, <sup>2</sup>Chapman University  
Topic Area: ATTENTION: Spatial

**Poster D11**      **Age-related changes of interoception, insula cortex, and emotional sensitivity**

Yuri Terasawa<sup>1</sup>, Satoshi Umeda<sup>1</sup>; <sup>1</sup>Department of Psychology, Keio University  
Topic Area: EMOTION & SOCIAL: Development & aging

**Poster D12**      **Brain activity and network interactions in the impact of internal emotional distraction: A multi-modal brain imaging investigation**

Florin Dolcos<sup>1</sup>, Alexandru Iordan<sup>2</sup>, Matthew Moore<sup>1</sup>, Yuta Katsumi<sup>1</sup>, Sanda Dolcos<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign, <sup>2</sup>University of Michigan  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster D13 Spatial distancing reduces emotional arousal to reactivated memories**

Natasha Parikh<sup>1</sup>, Brynn McGovern<sup>1</sup>, Kevin S. LaBar<sup>1</sup>; <sup>1</sup>Duke University  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster D14 Hierarchical Neural Representations Behind Naturalistic 'Social Norm' Perception In Autism and Controls**

Felipe Pegado<sup>1</sup>, Hans Op de Beeck<sup>1</sup>; <sup>1</sup>KU Leuven  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster D15 Task-dependent evaluative processing of moral and emotional content during reading comprehension: An ERP study**

Angelika Kunkel<sup>1</sup>, Ian Grant Mackenzie<sup>1</sup>, Ruth Filik<sup>2</sup>, Hartmut Leuthold<sup>1</sup>;  
<sup>1</sup>University of Tübingen, <sup>2</sup>University of Nottingham  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster D16 Inter-subject synchronization of young adult brain activity reveals justification of gun violence in movies**

Azeez Adebimpe<sup>1</sup>, Danielle S. Bassett<sup>2,3</sup>, Daniel Romer<sup>1</sup>; <sup>1</sup>Annenberg Publ. Policy Ctr., Univ. of Pennsylvania, Philadelphia, PA, <sup>2</sup>Dept. of Bioengineering, Univ. of Pennsylvania, Bioengineering, PA, <sup>3</sup>Dept. of Electrical & Systems Eng., Univ. of Pennsylvania, Philadelphia, PA  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster D17 Eye movements predict immediate and long-term effects of emotion regulation: An eye-tracking investigation**

Margaret O'Brien<sup>1</sup>, Yuta Katsumi<sup>1</sup>, Alexandru Iordan<sup>2</sup>, JulieAnn Scherer<sup>1</sup>, Alejandro Lleras<sup>1</sup>, Simona Buetti<sup>1</sup>, Sanda Dolcos<sup>1</sup>, Florin Dolcos<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign, <sup>2</sup>University of Michigan Ann Arbor  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster D18 The Brain Responses in Integration of Emotional information of Facial Expression and Emotional Prosody**

Shih-Tseng T. Huang<sup>1,2</sup>; <sup>1</sup>Department of Psychology, National Chung-Cheng University, Taiwan, <sup>2</sup>Center for research in Cognitive Science, National Chung-Cheng University, Taiwan  
Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster D19 Attenuated P3 and FPS During Social Support in Individuals with Psychopathic Traits**

Meghan Pierce<sup>1,2</sup>, Stephen Benning<sup>3</sup>; <sup>1</sup>Translational Research Center for TBI and Stress Disorders (TRACTS), VA Boston Healthcare System, Boston, MA, <sup>2</sup>Harvard Medical School, <sup>3</sup>University of Nevada, Las Vegas  
Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster D20 Neural mechanism underlying the suppressing effect of self-esteem on envy and schadenfreude**

Shohei Yamazaki<sup>1</sup>, Motoaki Sugiura<sup>1</sup>, Kelssy H. dos S. Kawata<sup>1</sup>, Yukako Sasaki<sup>1</sup>, Rui Nouchi<sup>1</sup>, Kohei Sakaki<sup>1</sup>, Shigeyuki Ikeda<sup>1</sup>, Ryuta Kawashima<sup>1</sup>;  
<sup>1</sup>Tohoku University  
Topic Area: EMOTION & SOCIAL: Other

**Poster D21 Social perspective taking shapes both eye-movements and brain hemodynamic activity during viewing of drama movie**

Iiro P. Jääskeläinen<sup>1</sup>, Mareike Bacha-Trams<sup>1</sup>, Elisa Ryyppö<sup>1</sup>, Enrico Glerean<sup>1</sup>, Mikko Sams<sup>1</sup>; <sup>1</sup>Aalto University School of Science, Espoo, Finland  
Topic Area: EMOTION & SOCIAL: Person perception

**Poster D22 Reliability of evoked responses varies as a function of autistic traits in healthy adults**

Meghan Puglia<sup>1</sup>, Jessica Connelly<sup>1</sup>, James Morris<sup>1</sup>; <sup>1</sup>University of Virginia  
Topic Area: EMOTION & SOCIAL: Person perception

**Poster D23 Neural and cognitive/motivational mechanisms underlying the processing of gender stereotype roles**

Berry van den Berg<sup>1,2</sup>, Jolien van Breen<sup>1,3</sup>, Russell Spears<sup>1</sup>, Monique Lorist<sup>1,2</sup>; <sup>1</sup>University of Groningen, <sup>2</sup>University Medical Center Groningen, <sup>3</sup>University of Exeter  
Topic Area: EMOTION & SOCIAL: Self perception

**Poster D24 Differences in the peri-adolescent association of cognitive abilities and striatal intrinsic functional connectivity as a function of age and sex**

Rachel K Spooner<sup>1</sup>, Nicholas Christopher-Hayes<sup>1</sup>, Julia M Stephen<sup>2</sup>, Vince D Calhoun<sup>2</sup>, Yu-Ping Wang<sup>3</sup>, Tony W Wilson<sup>1</sup>, David E Warren<sup>1</sup>; <sup>1</sup>University of Nebraska Medical Center, <sup>2</sup>Mind Research Network, <sup>3</sup>Tulane University  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster D25 Characterizing the Impact of Aging on Automatic Inhibition**

Tzu-Ling Li<sup>1</sup>, Erik Chang<sup>1</sup>; <sup>1</sup>National Central University  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster D26 Differences in Decline in the Subcomponents of the Unity-Diversity Model of Executive Functioning between Younger and Older Adults: A Meta Analysis**

Ted Maldonado<sup>1</sup>, Joseph M. Orr<sup>1</sup>, Jessica A. Bernard<sup>1</sup>; <sup>1</sup>Texas A&M University  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster D27 Metacognitive Training Induces Neurodevelopmental Changes in Prefrontal Regions**

Kshipra Gurunandan<sup>1</sup>, M. Rosario Rueda<sup>2</sup>, Sonia Guerra<sup>2</sup>, Manuel Carreiras<sup>1,3</sup>, Pedro M. Paz-Alonso<sup>1</sup>; <sup>1</sup>Basque Center on Cognition, Brain and Language, <sup>2</sup>Universidad de Granada, <sup>3</sup>Ikerbasque - Basque Foundation for Science  
Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster D28 Functional networks involved in creative planning while performing an ongoing task**

David Mailet<sup>1,2</sup>, Roger Beaty<sup>3</sup>, Aaron Kucyi<sup>4</sup>, Daniel Schacter<sup>3</sup>; <sup>1</sup>Department of Psychology, University of Toronto, <sup>2</sup>Baycrest Health Sciences, <sup>3</sup>Department of Psychology, Harvard University, <sup>4</sup>Neurology and Neurological Sciences, Stanford University  
Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster D29 Connectivity Patterns in Hierarchical Cascade of Prefrontal Networks Predict Multitasking Ability**

Tanya Wen<sup>1,2</sup>, De-Cyuan Liu<sup>3</sup>, Shulan Hsieh<sup>4</sup>; <sup>1</sup>Medical Research Council, <sup>2</sup>University of Cambridge, <sup>3</sup>Asia University, <sup>4</sup>National Cheng Kung University  
Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster D30 Different control dimensions organize task-set representations in novel instructed behavior**

Ana F. Palenciano<sup>1</sup>, Carlos Gonzalez-Garcia<sup>2</sup>, Srikanth Padmala<sup>3</sup>, Juan E. Arco<sup>1</sup>, Luiz Pessoa<sup>3</sup>, Maria Ruz<sup>1</sup>; <sup>1</sup>University of Granada, Spain, <sup>2</sup>Ghent University, Belgium, <sup>3</sup>University of Maryland



Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster D31            Activation and Connectivity at the Decision and Execution Phases of a Voluntary Task Switching Paradigm**

Derek M. Smith<sup>1</sup>, Eric H. Schumacher<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster D32            Does conflict adaptation affect stimulus or response selection?**

Melissa Moss<sup>1</sup>, Atsushi Kikumoto<sup>1</sup>, Ulrich Mayr<sup>1</sup>; <sup>1</sup>University of Oregon  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster D33            Daily intermittent moderate-to-vigorous and vigorous physical activity is related to faster P3 latency in preadolescents**

Dominika Pindus<sup>1</sup>, Lauren B. Raine<sup>1</sup>, Eric S. Drollette<sup>2</sup>, Daniel Westfall<sup>1</sup>, Shih-Chun Kao<sup>1</sup>, Naiman A. Khan<sup>3</sup>, Arthur F. Kramer<sup>1,4</sup>, Charles H. Hillman<sup>1,5</sup>; <sup>1</sup>Department of Psychology, Northeastern University, <sup>2</sup>Department of Kinesiology, University of North Carolina Greensboro, <sup>3</sup>Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, <sup>4</sup>Beckman Institute for Advanced Science and Technology, University of Illinois, <sup>5</sup>Department of Health Sciences, Northeastern University  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster D34            The influence of predictability and parametrically varying conflict level on performance and cognitive control**

Harrison Ritz<sup>1</sup>, Amitai Shenhav<sup>1</sup>; <sup>1</sup>Brown University  
Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster D35            The role of dorsolateral prefrontal cortex in error processing: a combined ERP-TMS study**

Fabio Masina<sup>1</sup>, Vincenza Tarantino<sup>1</sup>, Antonino Vallesi<sup>1,2</sup>, Daniela Mapelli<sup>1</sup>; <sup>1</sup>University of Padua, <sup>2</sup>San Camillo Hospital IRCCS, Venice  
Topic Area: EXECUTIVE PROCESSES: Other

**Poster D36            Functional Parcellation of the Temporo-Parietal Junction in Individual Subjects**

Kathryn Devaney<sup>1</sup>, Emily Levin<sup>2</sup>, James Higgins<sup>3</sup>, David Somers<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>Brown University, <sup>3</sup>Northwestern University  
Topic Area: EXECUTIVE PROCESSES: Other

**Poster D37            tACS on, tACS off: entrainment of neural oscillations during WM**

Kevin Jones<sup>1,2</sup>, Hector Arciniega<sup>1</sup>, Jennifer Shepack<sup>1</sup>, Carlos Carrasco<sup>1</sup>, Marian Berryhill<sup>1</sup>; <sup>1</sup>University of Nevada, Reno, <sup>2</sup>Colorado State University  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster D38            The Prefrontal Theta Activity During Thought Suppression Compared with Thought Free Predicts Lower Working Memory and Higher Worry Symptoms and Rumination in High Trait Anxiety**

Salahadin Lotfi<sup>1</sup>, Maryam Ayazi<sup>1</sup>, Ken Bennette<sup>1</sup>, Lukas Dommer<sup>1</sup>, Abel Mathew<sup>1</sup>, Christine Larson<sup>1</sup>, Hanjoo Lee<sup>1</sup>; <sup>1</sup>University of Wisconsin-Milwaukee  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster D39            Behavioral oscillations in multi-item visual working memory**

Jingtai Liu<sup>1</sup>, Taosheng Liu<sup>1</sup>, Susan Ravizza<sup>1</sup>; <sup>1</sup>Michigan State University  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster D40            Sex and Developmental Differences in the Oscillatory Dynamics Serving Verbal Working Memory: a MEG Study**

Christine M Embury<sup>1,2</sup>, Alex I Wiesman<sup>1</sup>, Amy L Proskovec<sup>1,2</sup>, Elizabeth Heinrichs-Graham<sup>1</sup>, Yu-Ping Wang<sup>3</sup>, Vince D Calhoun<sup>4,5</sup>, Julia M Stephen<sup>4</sup>, Tony W Wilson<sup>1,2</sup>; <sup>1</sup>University of Nebraska Medical Center, Omaha, NE, <sup>2</sup>University of Nebraska Omaha, Omaha, NE, <sup>3</sup>Tulane University, New Orleans, LA, <sup>4</sup>The Mind Research Network, Albuquerque, NM, <sup>5</sup>University of New Mexico, Albuquerque, NM  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster D41            Alpha and theta enhancement during self-ordered number generation**

Bobby Ruijgrok<sup>1</sup>, Olga Kepinska<sup>2</sup>; <sup>1</sup>Leiden University, <sup>2</sup>University of California San Francisco  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster D42            Oscillatory Synchrony within the Hippocampal-Thalamo-Prefrontal Circuit of the Rat During Spatial Working Memory-Guided Decision Making**

Andrew Garcia<sup>1</sup>, Amy Griffin<sup>1</sup>; <sup>1</sup>University of Delaware  
Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster D43            Ortho-semantic learning of novel words in Grade 3 students: An ERP study**

Alena Galilee<sup>1</sup>, Lisa Beck<sup>1</sup>, Catherine Mimeau<sup>2</sup>, S. Hélène Deacon<sup>1</sup>, Aaron J Newman<sup>1</sup>; <sup>1</sup>Dalhousie University, Nova Scotia, B3H 4R2, Canada, <sup>2</sup>Université Laval, Quebec City, G1V 0A6, Quebec, Canada  
Topic Area: LANGUAGE: Development & aging

**Poster D44            Language control network in trilinguals**

Jing Yang<sup>1</sup>, Jiali Wu<sup>2</sup>, Qi Zhang<sup>3</sup>, Ruiming Wang<sup>4</sup>, Ke Zhou<sup>5</sup>; <sup>1</sup>Bilingual Cognition and Development Lab, Center for Linguistics and Applied Linguistics, Guangdong University of Foreign Studies, Guangzhou 510420, China, <sup>2</sup>Bilingual Cognition and Development Lab, Center for Linguistics and Applied Linguistics, Guangdong University of Foreign Studies, Guangzhou 510420, China, <sup>3</sup>Bilingual Cognition and Development Lab, Center for Linguistics and Applied Linguistics, Guangdong University of Foreign Studies, Guangzhou 510420, China, <sup>4</sup>Guangdong Provincial Key Laboratory of Mental Health and Cognitive Science, Center for Studies of Psychological Application, School of Psychology, South China Normal University, Guangzhou 510631, China, <sup>5</sup>College of Psychology and Sociology, Shenzhen University, Shenzhen 518060, China  
Topic Area: LANGUAGE: Lexicon

Topic Area: LANGUAGE: Lexicon

**Poster D45            Cortex can entrain to predictable sequences even in the absence of periodicity**

Geoffrey Brookshire<sup>1,2</sup>, Daniel Casasanto<sup>1,2</sup>; <sup>1</sup>Cornell University, <sup>2</sup>University of Chicago  
Topic Area: LANGUAGE: Other

**Poster D46            Task switching decomposed: MEG evidence from bimodal language switching**

Esti Blanco-Elorrieta<sup>1,2</sup>, Karen Emmorey<sup>3</sup>, Liina Pykkänen<sup>1,2</sup>; <sup>1</sup>New York University, <sup>2</sup>NYUAD Institute, <sup>3</sup>San Diego State University  
Topic Area: LANGUAGE: Other

**Poster D47**      **Language-specific and domain-general regions jointly predict individual differences in sentence comprehension: Evidence from a network approach**

Qiuhai Yue<sup>1</sup>, Randi C. Martin<sup>1</sup>, Simon Fischer-Baum<sup>1</sup>, Michael W. Deem<sup>1</sup>;  
<sup>1</sup>Rice University  
Topic Area: LANGUAGE: Other

**Poster D48**      **fMRI Mapping of Language Areas in Bilingual Neurosurgical Patients**

Lok Wa Laura Leung<sup>1,2</sup>, Prashin Unadkat<sup>1</sup>, Luca Fumagalli<sup>1,3</sup>, Laura Rigolo<sup>1</sup>, Alexandra Golby<sup>1</sup>, Yanmei Tie<sup>1</sup>; <sup>1</sup>Harvard Medical School, Boston, MA, USA, <sup>2</sup>The Chinese University of Hong Kong, Hong Kong, <sup>3</sup>Università degli Studi di Milano-Bicocca, Milan, Italy  
Topic Area: LANGUAGE: Other

**Poster D49**      **Auditory fMRI language 'localizer' study with epilepsy patients**

Beau Snoad<sup>1</sup>, Phillip Gander<sup>1</sup>, Matthew Howard III<sup>1</sup>; <sup>1</sup>University of Iowa  
Topic Area: LANGUAGE: Other

**Poster D50**      **Differences in Resting State Functional Connectivity Between Early and Late Bilinguals**

Laura Mesite<sup>1</sup>, Sibylla Leon Guerrero<sup>1</sup>, Veronica Whitford<sup>2</sup>, Gigi Luk<sup>1</sup>;  
<sup>1</sup>Harvard Graduate School of Education, <sup>2</sup>The University of Texas at El Paso  
Topic Area: LANGUAGE: Other

**Poster D51**      **Rapid microstructural brain plasticity following a short word learning session: a combined TMS and diffusion kurtosis imaging study**

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Topic Area: LANGUAGE: Semantic

**Poster D52**      **Brain Response to Semantic Violations in a Miniature Artificial Language about Time**

Seana Coulson<sup>1</sup>, Tania Delgado<sup>1</sup>, Tyler Marghetis<sup>2</sup>, Tessa Verhoeff<sup>1,3</sup>, Esther Walker<sup>1</sup>; <sup>1</sup>University of California, San Diego, <sup>2</sup>Indiana University, <sup>3</sup>Leiden University  
Topic Area: LANGUAGE: Semantic

**Poster D53**      **How abstract concepts are neurally represented**

Robert Vargas<sup>1</sup>, Marcel Just<sup>1</sup>; <sup>1</sup>Carnegie Mellon University  
Topic Area: LANGUAGE: Semantic

**Poster D54**      **The unbearable lightness of meaning: Linking adjective informativity and flexibility**

Sarah Solomon<sup>1</sup>, Sharon L Thompson-Schill<sup>1</sup>; <sup>1</sup>University of Pennsylvania  
Topic Area: LANGUAGE: Semantic

**Poster D55**      **Systematic Variability in Language Related ERP Morphology**

Shannon McKnight<sup>1</sup>, Donald Bell-Souder<sup>1</sup>, Akira Miyake<sup>1</sup>, Albert Kim<sup>1</sup>;  
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Topic Area: LANGUAGE: Syntax

**Poster D56**      **The Influence of Verb Bias on Online Mandarin Relative Clause (RC) Processing: an ERP study**

Jou-An Chung<sup>1</sup>, Chia-Lin Lee<sup>1</sup>, Chia-Ying Lee<sup>2</sup>; <sup>1</sup>National Taiwan University, Taiwan, <sup>2</sup>Academia Sinica, Taiwan  
Topic Area: LANGUAGE: Syntax

**Poster D57**      **Multiple brain markers mediate age-related changes in cognition**

Trey Hedden<sup>1,2</sup>, Hannah E. Nierle<sup>1</sup>, Rodrigo D. Perea<sup>1,2</sup>, Jennifer S. Rabin<sup>1,2</sup>, Rachel F. Buckley<sup>1,2,3</sup>, Aaron P. Schultz<sup>1,2</sup>, Keith A. Johnson<sup>1,2,4</sup>, Reisa A. Sperling<sup>1,2,4</sup>; <sup>1</sup>Massachusetts General Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>University of Melbourne, <sup>4</sup>Brigham and Women's Hospital  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster D58**      **Reward learning in pre-symptomatic and symptomatic Huntington's disease**

Madeleine Sharp<sup>1</sup>, Karen Marder<sup>2</sup>, Daphna Shohamy<sup>3</sup>; <sup>1</sup>McGill University, <sup>2</sup>Columbia University Medical Center, <sup>3</sup>Columbia University  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster D59**      **I did it my way: Explaining age-related declines in inter-subject synchronization during naturalistic viewing**

Karen Campbell<sup>1</sup>, Cam-CAN<sup>2</sup>, Linda Geerligts<sup>3</sup>; <sup>1</sup>Brock University, <sup>2</sup>Cambridge Centre for Ageing and Neuroscience, University of Cambridge and MRC Cognition and Brain Sciences Unit, <sup>3</sup>Donders Institute for Brain, Cognition and Behaviour, Radboud University  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster D60**      **Self-Focus Encoding Increases Non-Diagnostic Recollection and the LPC Event-Related Potential**

P. Andrew Leynes<sup>1</sup>, Cristina Nardini<sup>1</sup>; <sup>1</sup>The College of New Jersey, <sup>2</sup>The College of New Jersey  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D61**      **Neural pattern classification tracks transfer-appropriate processing in episodic memory**

Mikael Johansson<sup>1</sup>, Inês Bramão<sup>1</sup>; <sup>1</sup>Lund University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D62**      **Age differences in neural pattern similarity associated with false recognition**

Caitlin Bowman<sup>1</sup>, Christina Webb<sup>2</sup>, Jordan Chamberlain<sup>2</sup>, Nancy Dennis<sup>2</sup>;  
<sup>1</sup>University of Oregon, <sup>2</sup>The Pennsylvania State University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D63**      **Neural mechanisms of episodic retrieval support divergent creative thinking**

Kevin P. Madore<sup>1</sup>, Preston P. Thakral<sup>2</sup>, Roger E. Beaty<sup>2</sup>, Donna Rose Addis<sup>3</sup>, Daniel L. Schacter<sup>2</sup>; <sup>1</sup>Stanford University, <sup>2</sup>Harvard University, <sup>3</sup>University of Auckland  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D64**      **Scene-specific cortically distributed activation patterns predict mnemonic reactivation**

Benjamin R Geib<sup>1</sup>, Erik A Wing<sup>1</sup>, Marty G Woldorff<sup>1</sup>, Roberto Cabeza<sup>1</sup>; <sup>1</sup>Duke University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D65 Remembering with high fidelity: Evidence implicating sleep and sleep spindles**

Sarah Witkowski<sup>1</sup>, Jessica Creery<sup>1</sup>, Leonardo Dionisio<sup>1</sup>, Ken A. Paller<sup>1</sup>;  
<sup>1</sup>Northwestern University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D66 Transient and sustained processes involved in encoding emotional information**

Kyle A Kurkela<sup>1</sup>, Rosalie Samide<sup>1</sup>, Maureen Ritchey<sup>1</sup>; <sup>1</sup>Boston College

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D67 Current sleep disturbance in older people with a lifetime history of depression is associated with increased connectivity in the Default Mode Network**

Andrew McKinnon<sup>1,4,8</sup>, Ian Hickie<sup>1</sup>, Jan Scott<sup>1</sup>, Shantel Duffy<sup>1,7</sup>, Louisa Norrie<sup>1</sup>, Zoe Terpening<sup>1</sup>, Ron Grunstein<sup>5</sup>, Jim Lagopoulos<sup>1,6</sup>, Jennifer Batchelor<sup>4</sup>, Simon Lewis<sup>1</sup>, James Shine<sup>1</sup>, Sharon Naismith<sup>1,2,3</sup>; <sup>1</sup>Healthy Brain Ageing Program, <sup>2</sup>School of Psychology, <sup>3</sup>Charles Perkins Centre and Brain and Mind Centre, The University of Sydney, <sup>4</sup>Department of Psychology, Macquarie University, <sup>5</sup>Woolcock Institute of Medical Research, NSW, Australia, <sup>6</sup>Sunshine Coast Mind and Neuroscience - Thompson Institute, University of the Sunshine Coast, QLD, Australia, <sup>7</sup>Central Clinical School, Faculty of Medicine, The University of Sydney, <sup>8</sup>Cognition and Neuroimaging Lab, Department of Psychology, The University of Arizona

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D68 Encoding Focus Does Not Affect Recollection of Action Memories: Event Related Potentials (ERP) and Modeling Evidence**

Cristina Nardini<sup>1</sup>, Anna Abriman<sup>1</sup>, Alex Batterman<sup>1</sup>, Sabrina Bogovic<sup>1</sup>, Nick Danduone<sup>1</sup>, Suma Mallepeddi<sup>1</sup>, Palak Patel<sup>1</sup>, Tanushi Upadhyay<sup>1</sup>, Kanza Tahir<sup>1</sup>, P. Andrew Leynes<sup>1</sup>; <sup>1</sup>The College of New Jersey

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D69 Functional wiring of the human medial temporal lobe**

Ethan Solomon<sup>1</sup>, Joel Stein<sup>1</sup>, Sandy Das<sup>1</sup>, Michael Sperling<sup>2</sup>, Kareem Zaghloul<sup>3</sup>, Cory Inman<sup>4</sup>, Bradley Lega<sup>5</sup>, Kathryn Davis<sup>1</sup>, Gregory Worrell<sup>6</sup>, Barbara Jobst<sup>7</sup>, Daniel Rizzuto<sup>1</sup>, Michael Kahana<sup>1</sup>; <sup>1</sup>University of Pennsylvania, <sup>2</sup>Thomas Jefferson University Hospital, <sup>3</sup>National Institutes of Health, <sup>4</sup>Emory School of Medicine, <sup>5</sup>University of Texas Southwestern, <sup>6</sup>Mayo Clinic, <sup>7</sup>Dartmouth Medical Center

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D70 Unique Frontal Activation Patterns Associated with Depression Severity during Memory Retrieval in Women**

Jennifer Sneider<sup>1,2</sup>, Julia Cohen-Gilbert<sup>1,2</sup>, Derek A. Hamilton<sup>4</sup>, Carolyn Caine<sup>1</sup>, Maya Rieselbach<sup>1</sup>, Emily Oot<sup>1,3</sup>, Anna Seraikas<sup>1</sup>, Lisa D. Nickerson<sup>1,2</sup>, Marisa M. Silveri<sup>1,2,3</sup>; <sup>1</sup>McLean Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Boston University School of Medicine, <sup>4</sup>University of New Mexico

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D71 Late positive event-related potential tracks outcome of cumulative memory judgments**

Haopei Yang<sup>1,4</sup>, Ken McRae<sup>1,4</sup>, Stefan Köhler<sup>1,2,4,3</sup>; <sup>1</sup>The Brain and Mind Institute, <sup>2</sup>Rotman Institute of Philosophy, <sup>3</sup>Rotman Research Institute, Baycrest Centre, <sup>4</sup>Western University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D72 Dopaminergic modulation of associative memory in healthy humans**

Erin Kendall Braun<sup>1</sup>, Katherine Duncan<sup>2</sup>, Ragy Girgis<sup>3</sup>, Suzanne Wood<sup>2</sup>, Madeleine Sharp<sup>4</sup>, Camilla van Geen<sup>1</sup>, Anissa Abi-Dargham<sup>5</sup>, Daphna Shohamy<sup>1,6,7</sup>; <sup>1</sup>Columbia University, <sup>2</sup>University of Toronto, <sup>3</sup>New York State Psychiatric Institute, <sup>4</sup>Montreal Neurological Institute, <sup>5</sup>Stony Brook University, <sup>6</sup>Zuckerman Mind, Brain Behavior Institute, <sup>7</sup>Kavli Institute for Brain Science

Topic Area: LONG-TERM MEMORY: Episodic

**Poster D73 Hippocampal contributions to reward learning**

Daniela Palombo<sup>1,2</sup>, Mieke Verfaellie<sup>1,2</sup>; <sup>1</sup>VA Boston Healthcare System Jamaica Plain, <sup>2</sup>Boston University School of Medicine, Department of Psychiatry

Topic Area: LONG-TERM MEMORY: Other

**Poster D74 Consolidated-like memories through testing**

Jaione Arnaez-Telleria<sup>1</sup>, Manuel Carreiras<sup>1,2,3</sup>, Pedro M. Paz-Alonso<sup>1</sup>; <sup>1</sup>BCBL - Basque Center on Cognition, Brain and Language, Donostia-San Sebastián, Spain, <sup>2</sup>IKERBASQUE, Basque Foundation for Science, Bilbao, Spain, <sup>3</sup>Departamento de Lengua Vasca y Comunicación, UPV/EHU, Bilbao, Spain

Topic Area: LONG-TERM MEMORY: Semantic

**Poster D75 Open arms and open minds: The effects of posture and modality on the recall of affect-related concepts**

Hannah M. Morrow<sup>1</sup>, Gitte H. Joergensen<sup>1</sup>, Eiling Yee<sup>1</sup>; <sup>1</sup>University of Connecticut

Topic Area: LONG-TERM MEMORY: Semantic

**Poster D76 Understanding “thunder” is more difficult than “rainbow” when performing a concurrent auditory task**

Roisin Healy<sup>1</sup>, Jonathan Serino<sup>1</sup>, Charles P. Davis<sup>1,2</sup>, Gitte H. Joergensen<sup>1,2</sup>, Eiling Yee<sup>1,2</sup>; <sup>1</sup>University of Connecticut, <sup>2</sup>Connecticut Institute for the Brain and Cognitive Sciences

Topic Area: LONG-TERM MEMORY: Semantic

**Poster D77**

**The effects of deep breathing on EEG during a flanker distractor interference task in children: A comparison between a lo-res consumer-grade and hi-res medical-grade system**

Kiat Hui Khng<sup>1</sup>; <sup>1</sup>National Institute of Education, Nanyang Technological University

Topic Area: METHODS: Electrophysiology

**Poster D78 Filtering improves skin-conductance response measures in the fMRI environment**

Anthony Privratsky<sup>1</sup>, Keith Bush<sup>1</sup>, Josh Cisler<sup>2</sup>; <sup>1</sup>University of Arkansas for Medical Sciences, <sup>2</sup>University of Wisconsin-Madison

Topic Area: METHODS: Electrophysiology

**Poster D79 Presurgical fMRI for Aiding Electrode Implantation in Deep Brain Stimulation: Case studies of Treatment-Resistant Depression**

Layla Gould<sup>1</sup>, Ivar Mendez<sup>1</sup>, Chelsea Ekstrand<sup>1</sup>, Marla Mickleborough<sup>1</sup>, Tasha Ellchuk<sup>1</sup>, Eric Lorentz<sup>1</sup>, Ron Borowsky<sup>1</sup>; <sup>1</sup>University of Saskatchewan

Topic Area: METHODS: Neuroimaging

**Poster D80 Localized test-retest reliability of fMRI task activity**

Johan Jansma<sup>1</sup>, Geert-Jan Rutten<sup>1</sup>; <sup>1</sup>ETZ Elisabeth Hospital, Department of Neurosurgery, Tilburg, the Netherlands  
Topic Area: METHODS: Neuroimaging

**Poster D81 Brain Activity Associated with Self-Injurious Thoughts and Behaviors: A Meta-Analysis of Neuroimaging Studies**

Kelly Rootes-Murdy<sup>1</sup>, Xieying Huang<sup>1</sup>, Joseph C. Franklin<sup>1</sup>, Derek E. Nee<sup>1</sup>; <sup>1</sup>Florida State University  
Topic Area: METHODS: Neuroimaging

**Poster D82 Dynamic transient brain networks overlap with regional gene expression in a single gene developmental disorder**

Erin Hawkins<sup>1</sup>, Danyal Akarca<sup>1</sup>, Mengya Zhang<sup>1</sup>, Mark Woolrich<sup>2</sup>, Kate Baker<sup>3</sup>, Duncan Astle<sup>1</sup>; <sup>1</sup>MRC Cognition and Brain Sciences Unit, University of Cambridge, <sup>2</sup>Oxford Centre for Human Brain Activity, University of Oxford, <sup>3</sup>Department of Medical Genetics, University of Cambridge  
Topic Area: METHODS: Neuroimaging

**Poster D83 Characterizing the Effects of Transcranial Direct Current Stimulation on Frontal Lobe Activity Using Diffuse Correlational Spectroscopy**

Evangelia G. Chryssikou<sup>1</sup>, Wesley Baker<sup>2</sup>, Lin Wang<sup>2</sup>, Arjun G. Yodh<sup>2</sup>, Roy H. Hamilton<sup>2</sup>; <sup>1</sup>University of Kansas, <sup>2</sup>University of Pennsylvania  
Topic Area: METHODS: Other

**Poster D84 Neural correlates of melodic prediction violations: similarities to language processing**

Allison R. Fogel<sup>1</sup>, Gina R. Kuperberg<sup>1,2,3</sup>, Aniruddh D. Patel<sup>1</sup>; <sup>1</sup>Tufts University, <sup>2</sup>MGH/HST Athinoula A. Martinos Center for Biomedical Imaging, <sup>3</sup>Massachusetts General Hospital  
Topic Area: OTHER

**Poster D85 Expertise Matters in Evaluating Students' Organization of Neuroscience Concepts**

Noah C. Yeagley<sup>1</sup>, Jennifer L. Stevenson<sup>1</sup>, Joel P. Bish<sup>1</sup>; <sup>1</sup>Ursinus College  
Topic Area: OTHER

**Poster D86 Early visual cortex is recruited for executive functioning in congenital blindness**

Shipra Kanjlia<sup>1</sup>, Marina Bedny<sup>1</sup>; <sup>1</sup>Johns Hopkins University  
Topic Area: OTHER

**Poster D87 Neural correlates of rhythm induced trance: Evidence from fMRI and EEG**

Michael Hove<sup>1</sup>, Assal Habibi<sup>2</sup>, Molly J Henry<sup>3</sup>, Johannes Stelzer<sup>4</sup>, B Rael Cahn<sup>2</sup>; <sup>1</sup>Fitchburg State University, <sup>2</sup>University of Southern California, <sup>3</sup>University of Western Ontario, <sup>4</sup>Max Planck Institute for Biological Cybernetics  
Topic Area: PERCEPTION & ACTION: Audition

**Poster D88 The effects of the amplitude envelope of speech on speech intelligibility**

Mako Ishida<sup>1,2,3</sup>, Takayuki Arai<sup>3</sup>, Makio Kashino<sup>1</sup>; <sup>1</sup>NTT Communication Science Laboratories, <sup>2</sup>Japan Society for the Promotion of Science, <sup>3</sup>Sophia University  
Topic Area: PERCEPTION & ACTION: Audition

**Poster D89 Norepinephrine signals functional resetting: Evidence from human pupil dilation to pattern changes**

Sijia Zhao<sup>1</sup>, Shigeto Furukawa<sup>2</sup>, Hsin-I Liao<sup>2</sup>, Frederic Dick<sup>3</sup>, Maria Chait<sup>1</sup>; <sup>1</sup>Ear Institute, University College London, UK, <sup>2</sup>NTT Communication Science Laboratories, NTT Corporation, Japan, <sup>3</sup>Birkbeck-UCL Centre for Neuroimaging, London, UK  
Topic Area: PERCEPTION & ACTION: Audition

**Poster D90 Source localization of mismatch responses at 7 and 12 months in a multifeature auditory paradigm**

Katherine Wolfert<sup>1</sup>, Silvia Ortiz-Mantilla<sup>1</sup>, Teresa Realpe-Bonilla<sup>1</sup>, April A. Benasich<sup>1</sup>; <sup>1</sup>Rutgers University-Newark  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster D91 Odor Familiarity and the Conversion from Mild Cognitive Impairment to Alzheimer's**

Paul Wheeler<sup>1</sup>, Claire Murphy<sup>1,2,3</sup>; <sup>1</sup>San Diego State University, <sup>2</sup>SDSU/UCSD Joint Doctoral Program in Clinical Psychology, <sup>3</sup>University of California San Diego  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster D92 Auditory-motor Learning Drives Motor Activation in Subsequent Auditory Processing**

John Myers<sup>1</sup>, Jeffrey Mock<sup>1</sup>, Edward Golob<sup>1</sup>; <sup>1</sup>University of Texas at San Antonio  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster D93 Assessment and Communication with Locked-in Patients Using A Vibro-tactile P300 and Motor Imagery Brain-Computer Interface**

Christoph Guger<sup>1,2</sup>, Rossella Spataro<sup>3</sup>, Woosang Cho<sup>2</sup>, Rupert Ortner<sup>2</sup>, Fan Cao<sup>1</sup>, V. Labella<sup>3</sup>; <sup>1</sup>Guger Technologies OG, Graz, Austria, <sup>2</sup>g.tec medical engineering GmbH, Schiedlberg, Austria, <sup>3</sup>University of Palermo, Palermo, Italy  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster D94 The impact of a cognitive-psychophysiological therapy on motor planning and execution in Tourette syndrome patients**

Simon Morand-Beaulieu<sup>1,2</sup>, Marie-Ange Perreault<sup>1,2</sup>, Kieron P. O'Connor<sup>1,2</sup>, Pierre J. Blanchet<sup>1,2</sup>, Marc E. Lavoie<sup>1,2</sup>; <sup>1</sup>Centre de recherche de l'Institut universitaire en santé mentale de Montréal, Montreal, QC, Canada, <sup>2</sup>Université de Montréal, Montreal, QC, Canada  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster D95 Is a round shape integrated with a /bouba/ sound? Enhanced neuronal signals at the intermodulation frequencies of congruent audio-visual stimuli**

Hui Mei Chow<sup>1</sup>, Brianna Leonardo<sup>1</sup>, Aleksandra Sabov<sup>1</sup>, Vivian Ciaramitaro<sup>1</sup>; <sup>1</sup>University of Massachusetts Boston  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster D96 Rubber Hand Illusion enhancement induced by motor cortex inhibition**

Carlotta Fossataro<sup>1</sup>, Valentina Bruno<sup>1</sup>, Serena Giurgola<sup>2</sup>, Nadia Bolognini<sup>3,4</sup>, Francesca Garbarini<sup>1</sup>; <sup>1</sup>SAMBA – SpAtial, Motor & Bodily Awareness – Research Group, Psychology Department, University of Turin, Turin, Italy, <sup>2</sup>Department of Medicine and Surgery, University of Milano-Bicocca, Milan Italy, <sup>3</sup>Department of Psychology & NeuroMI – Milan Center for Neuroscience, University of Milano-Bicocca, Milano, Italy,

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Topic Area: PERCEPTION & ACTION: Multisensory

**Poster D97 Long-term tool-use changes body representation**

Lara Coelho<sup>1</sup>, Jason Schacher<sup>1</sup>, Jon Doan<sup>1</sup>, Claudia Gonzalez<sup>1</sup>; <sup>1</sup>University of Lethbridge

Topic Area: PERCEPTION & ACTION: Multisensory

**Poster D98 Biased tactile localization with an intact somatosensory system: A case study**

Yuqi Liu<sup>1</sup>, Alexandria O'Neal<sup>1</sup>, Jared Medina<sup>1</sup>; <sup>1</sup>University of Delaware

Topic Area: PERCEPTION & ACTION: Other

**Poster D99 Spontaneous in-flight accommodation of hand orientation to unseen grasp targets: A case of action blindsight**

Emily K. Prentiss<sup>1</sup>, Colleen L. Schneider<sup>1,2</sup>, Zoë R. Williams<sup>3</sup>, Bogachan Sahin<sup>3</sup>, Bradford Z. Mahon<sup>1,3</sup>; <sup>1</sup>University of Rochester, <sup>2</sup>University of Rochester School of Medicine and Dentistry, <sup>3</sup>University of Rochester Medical Center

Topic Area: PERCEPTION & ACTION: Vision

**Poster D100 Unfolding of lateralized neural responses to facial information**

Sanne Brederoo<sup>1,2</sup>, Berry Van den Berg<sup>1,2</sup>, Mark Nieuwenstein<sup>1</sup>, Monique Loris<sup>1,2</sup>; <sup>1</sup>Department of Experimental Psychology, University of Groningen, The Netherlands, <sup>2</sup>Department of Neuroscience, University Medical Center Groningen, The Netherlands

Topic Area: PERCEPTION & ACTION: Vision

**Poster D101 Neuroplastic and Neurovascular Contributions to Visual Recovery in Post-Stroke Cortical Blindness**

Colleen Schneider<sup>1,2</sup>, Emily Prentiss<sup>2</sup>, Zoe Williams<sup>1</sup>, Bogachan Sahin<sup>1</sup>, Bradford Mahon<sup>1,2</sup>; <sup>1</sup>University of Rochester School of Medicine and Dentistry, <sup>2</sup>University of Rochester School of Arts Sciences and Engineering

Topic Area: PERCEPTION & ACTION: Vision

**Poster D102 The Genesis of Visual Memory through Strong Perceptual Representations: Tracking the Spatio-Temporal Neural Trace of Memorability**

Caitlin Mullin<sup>1</sup>, Yalda Mohsenzadeh<sup>1</sup>, Dimitrios Pantazis<sup>1</sup>, Aude Oliva<sup>1</sup>; <sup>1</sup>MIT

Topic Area: PERCEPTION & ACTION: Vision

**Poster D103 Individual differences in dopamine D2 receptors and neural representations of subjective reward value**

Jaime Castrellon<sup>1</sup>, Linh Dang<sup>2</sup>, Jacob Young<sup>3</sup>, David Zald<sup>2</sup>, Gregory Samanez-Larkin<sup>1</sup>; <sup>1</sup>Duke University, <sup>2</sup>Vanderbilt University, <sup>3</sup>University of California, San Francisco

Topic Area: THINKING: Decision making

**Poster D104 What to choose? Goals determine the effect of set value on the speed of value-based decisions**

Romy Froemer<sup>1</sup>, Carolyn K. Dean Wolf<sup>1</sup>, Amitai Shenhav<sup>1</sup>; <sup>1</sup>Brown University

Topic Area: THINKING: Decision making

**Poster D105 The Association Between Health and Component Decision Processes**

Alexis Porter<sup>1</sup>, Regina Leckie<sup>2</sup>, Kirk Erickson<sup>2</sup>, Timothy Verstynen<sup>1</sup>; <sup>1</sup>Carnegie Mellon University, <sup>2</sup>University of Pittsburgh

Topic Area: THINKING: Decision making

**Poster D106 Drift-Diffusion Modeling of Reward Learning in Depression**

Victoria Lawlor<sup>1</sup>, Christian Webb<sup>1</sup>, Madhukar Trivedi<sup>2</sup>, Maurizio Fava<sup>3</sup>, Patrick McGrath<sup>4</sup>, Myrna Weissman<sup>4</sup>, Ramin Parsey<sup>5</sup>, Maria Oquendo<sup>6</sup>, Patricia Deldin<sup>7</sup>, Gerard Bruder<sup>4</sup>, Diego Pizzagalli<sup>1</sup>, Daniel Dillon<sup>1</sup>; <sup>1</sup>McLean Hospital, <sup>2</sup>University of Texas Southwestern Medical Center, <sup>3</sup>Massachusetts General Hospital, <sup>4</sup>Columbia University Medical Center, <sup>5</sup>Stony Brook School of Medicine, <sup>6</sup>University of Pennsylvania Perelman School of Medicine, <sup>7</sup>University of Michigan

Topic Area: THINKING: Decision making

**Poster D107 Investigating the cost of cognitive effort**

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Topic Area: THINKING: Decision making

**Poster D108 Optimizing STEM skills: A baseline assessment of the neural correlates of mental rotation**

Steven Greening<sup>1</sup>, Katherine Moen<sup>1</sup>, Stephanie Saltzman<sup>1</sup>, Lauryn Burleigh<sup>1</sup>, Leslie Butler<sup>1</sup>, Jagannathan Ramanujam<sup>1</sup>, Alex Cohen<sup>1</sup>, Melissa Beck<sup>1</sup>; <sup>1</sup>Louisiana State University

Topic Area: THINKING: Other

**Poster D109 When "2 x 4" is meaningful: the N400 and P300 reveal operand format effects in multiplication**

Vanessa Cerda<sup>1</sup>, Danielle S. Dickson<sup>1</sup>, Rosemary N. Beavers<sup>2</sup>, Andres G. Ruiz<sup>3</sup>, Nicole Y. Y. Wicha<sup>1,4</sup>; <sup>1</sup>University of Texas at San Antonio, <sup>2</sup>University of Texas Medical Branch, <sup>3</sup>Texas Tech University Health Sciences Center, <sup>4</sup>University of Texas at San Antonio Neurosciences Institute

Topic Area: THINKING: Problem solving

**Poster D110 Multivariate Prediction of General Intelligence from Patterns of Gray Matter Density**

Kirsten Hilger<sup>1,2</sup>, Tim Hahn<sup>3</sup>, Christian Fiebach<sup>1,2</sup>, Ulrike Basten<sup>1</sup>; <sup>1</sup>Goethe University Frankfurt, Frankfurt am Main, Germany, <sup>2</sup>DeA Center for Individual Development and Adaptive Education, Frankfurt am Main, Germany, <sup>3</sup>Universitätsklinikum Münster, Münster, Germany

Topic Area: THINKING: Reasoning

**Poster D111 Neurocognitive Relationships between Nonsymbolic and Symbolic Ratio Processing in Children and Adults**

John V. Binzak<sup>1</sup>, Yunji Park<sup>1</sup>, Elizabeth Y. Toomarian<sup>1</sup>, Priya B. Kalra<sup>1</sup>, Yun-Shiuan Chuang<sup>1</sup>, Percival G. Matthews<sup>1</sup>, Edward M. Hubbard<sup>1</sup>; <sup>1</sup>University of Wisconsin–Madison

Topic Area: THINKING: Reasoning

**Poster D112 P300, dispositional affect and sentence processing**

Janahan Selvanayagam<sup>1</sup>, Victoria Witte<sup>2</sup>, Louis Schmidt<sup>3</sup>, Veena D. Dwivedi<sup>1</sup>; <sup>1</sup>Brock University, <sup>2</sup>Heidelberg University, <sup>3</sup>McMaster University

Topic Area: LANGUAGE: Syntax

**Poster D113 Neural networks of specific and general autobiographical memory retrieval in younger and older adults**

Aleea Devitt<sup>1</sup>, Reece Roberts<sup>2</sup>, Abby Metson<sup>2</sup>, Lynette Tippett<sup>2</sup>, Donna Rose Addis<sup>2</sup>; <sup>1</sup>Harvard University, <sup>2</sup>The University of Auckland

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster D114 Parietal and occipitotemporal cortical reinstatement differentially predict successful associative memory retrieval in older adults**

Alexandra N. Trelle<sup>1</sup>, Valerie A. Carr<sup>2</sup>, Scott Guerin<sup>1</sup>, Wanjia Guo<sup>1</sup>, Marc B. Harrison<sup>1</sup>, Manasi Jayakumar<sup>1</sup>, Jiefeng Jiang<sup>1</sup>, Geoffrey Kerchner<sup>1</sup>, Elizabeth Mormino<sup>1</sup>, Natalie Tanner<sup>1</sup>, Monica Thieu<sup>3</sup>, Anthony D. Wagner<sup>1</sup>; <sup>1</sup>Stanford University, <sup>2</sup>San Jose State University, <sup>3</sup>Columbia University  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster D115 How do developmental shifts in attentional control influence memory encoding?**

Alexandra Decker<sup>1</sup>, Amy Finn<sup>1</sup>, Katherine Duncan<sup>1</sup>; <sup>1</sup>The University of Toronto  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster D116 The ERP correlates of self-knowledge: Are assessments of one's past, present, and future traits closer to semantic or episodic memory?**

Louis Renoult<sup>1</sup>, Annick N. Tanguay<sup>2</sup>, Lauren Benton<sup>3</sup>, Lorenza Romio<sup>1</sup>, Carolin Sievers<sup>1</sup>, Patrick S. R. Davidson<sup>2</sup>; <sup>1</sup>School of Psychology, University of East Anglia, Norfolk, UK, <sup>2</sup>School of Psychology, University of Ottawa, Ontario, Canada, <sup>3</sup>Department of Neuroscience, Dickinson College, Pennsylvania, USA  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D117 Generalization of associative item-memory EEG features to associative recognition**

Yvonne Y Chen<sup>1,2</sup>, Jeremy B Caplan<sup>1</sup>; <sup>1</sup>University of Alberta, <sup>2</sup>Baylor College of Medicine  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D118 Enhancing spatial memory via auditory entrainment of theta oscillations**

Jessica Creery<sup>1</sup>, Hadley C. Pfalzgraf<sup>1</sup>, Ken A. Paller<sup>1</sup>; <sup>1</sup>Northwestern University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D119 Pre-stimulus EEG oscillations reflect a preparatory form of episodic retrieval orientation**

Mason Price<sup>1</sup>, Emmitt Wright<sup>1</sup>, Elizabeth Griffiths<sup>2</sup>, Jeffrey Johnson<sup>1</sup>; <sup>1</sup>University of Missouri, <sup>2</sup>University of Surrey  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D120 Long-term memory specificity for faces depends on inhibition of closely related items**

Brittany M. Jeye<sup>1</sup>, Scott D. Slotnick<sup>1</sup>; <sup>1</sup>Boston College  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D121 Individual Differences in Value-Directed Encoding**

Blake Elliott<sup>1</sup>, Samuel McClure<sup>1</sup>, Gene Brewer<sup>1</sup>; <sup>1</sup>Arizona State University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D122 Investigating neural signatures of visual encoding and recall using 7T fMRI**

Elizabeth H. Hall<sup>1</sup>, Wilma A. Bainbridge<sup>1</sup>, Chris I. Baker<sup>1</sup>; <sup>1</sup>Laboratory of Brain and Cognition, National Institutes for Mental Health  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D123 Self-relevance underlies disgust salience in episodic memory**

David Anaki<sup>1</sup>, Hannah Tarder-Stoll<sup>2</sup>, Morris Moscovitch<sup>2,3</sup>; <sup>1</sup>Bar-Ilan University, <sup>2</sup>University of Toronto, <sup>3</sup>Baycrest Centre for Geriatric Care  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D124 Dissociable cortico-hippocampal networks during the processing of time and space information in episodic encoding**

Saeko Iwata<sup>1</sup>, Hikaru Sugimoto<sup>1,2</sup>, Takashi Tsukiura<sup>1</sup>; <sup>1</sup>Graduate School of Human and Environmental Studies, Kyoto University, <sup>2</sup>Japan Society for the Promotion of Science  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D125 Inhibition of distantly related items in long-term memory depends on the number of repetitions at encoding**

Cassidy McCarthy<sup>1</sup>, Brittany M. Jeye, Scott D. Slotnick; <sup>1</sup>Boston College  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D126 Depression and Anxiety Symptoms Influence Hippocampal Brain Activation during a Spatial Memory Task in Healthy Adolescents**

Anna Seraikas<sup>1</sup>, Julia Cohen-Gilbert<sup>1,2</sup>, Emily Oot<sup>1,3</sup>, Derek A. Hamilton<sup>4</sup>, Carolyn Caine<sup>1</sup>, Maya Rieselbach<sup>1</sup>, Lisa D. Nickerson<sup>1,2</sup>, Sion K. Harris<sup>5</sup>, Marisa M. Silveri<sup>1,2</sup>, Jennifer T. Sneider<sup>1,2</sup>; <sup>1</sup>McLean Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Boston University School of Medicine, <sup>4</sup>University of New Mexico, <sup>5</sup>Boston Children's Hospital  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D127 Structural Integrity Deficits of Uncinate Fasciculus Predict Medial Temporal Lobe Subfield Activity During an Emotional Pattern Separation Task**

Steven Granger<sup>1</sup>, Stephanie L. Leal<sup>2</sup>, Elizabeth A. Murray<sup>1</sup>, Michael A. Yassa<sup>1</sup>; <sup>1</sup>University of California, Irvine, <sup>2</sup>University of California, Berkeley  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster D128 Early stage brain topology alterations in low functioning autism**

Aditya Jayashankar<sup>1</sup>, Sowmyashree Kaku<sup>1</sup>, Satish Girimaji<sup>1</sup>, Sonia Bansal<sup>1</sup>, Suril Gohel<sup>2</sup>, Rose Dawn Bharath<sup>1</sup>, Shoba Srinath<sup>1</sup>; <sup>1</sup>National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore, India, <sup>2</sup>School of Health Professions, Rutgers University  
Topic Area: METHODS: Neuroimaging

**Poster D129 Event boundaries modulate neural representations of temporal context**

Lynn Lohnas<sup>1</sup>, M. Karl Healey<sup>2</sup>, Lila Davachi<sup>1</sup>; <sup>1</sup>New York University, <sup>2</sup>Michigan State University  
Topic Area: LONG-TERM MEMORY: Episodic

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## Poster Session E

Monday, March 26, 2:30-4:30 pm

**Poster E1 The Auditory Contralateral Occipital Positivity Within Unimodal Versus Bimodal Stimulation**

Daniel Roberts<sup>1</sup>, Steven Chong<sup>1</sup>, Craig McDonald<sup>1</sup>, Baldwin Carryl<sup>1</sup>; <sup>1</sup>George Mason University  
Topic Area: ATTENTION: Multisensory

**Poster E2            A neural score for engineering concepts: predicting STEM learning with multivariate pattern analysis of functional neuroimaging data**

Joshua S. Cetron<sup>1</sup>, Andrew C. Connolly<sup>2</sup>, Solomon G. Diamond<sup>3</sup>, Vicki V. May<sup>3</sup>, James V. Haxby<sup>1</sup>, David J. M. Kraemer<sup>1</sup>; <sup>1</sup>Dartmouth College, <sup>2</sup>Geisel School of Medicine at Dartmouth, <sup>3</sup>Thayer School of Engineering at Dartmouth  
Topic Area: THINKING: Reasoning

**Poster E3            Visual vs. auditory attentional cueing and auditory spatial discrimination**

Norbert Kopco<sup>1,2,3</sup>, Rene Sebens<sup>1</sup>, Bernadeta Hrebendarova<sup>1</sup>, Jyrki Ahveninen<sup>2</sup>, Virginia Best<sup>3</sup>, Barbara Shinn-Cunningham<sup>3</sup>; <sup>1</sup>Institute of Computer Science, P. J. Safarik University, Kosice, Slovakia, <sup>2</sup>Martinos Center for Biomedical Imaging, Mass Gen Hospital/Harvard Medical School, Boston, MA, USA, <sup>3</sup>Hearing Research Center, Boston University, Boston, MA, USA  
Topic Area: ATTENTION: Auditory

**Poster E4            Limited attention facilitates learning of peripheral information in children**

Michael Paul Dubois<sup>1</sup>, Theresa Pham<sup>1,2</sup>, Danielle Lim<sup>1</sup>, Amy Finn<sup>1</sup>; <sup>1</sup>University of Toronto, <sup>2</sup>University of Western Ontario  
Topic Area: ATTENTION: Development & aging

**Poster E6            The neural timecourse of the endogenous shifting of attention to objects**

Charles Giattino<sup>1</sup>, Saikiran Gudla<sup>1</sup>, Marty Woldorff<sup>1</sup>; <sup>1</sup>Duke University  
Topic Area: ATTENTION: Nonspatial

**Poster E7            Neural correlates of eye movements during naturalistic viewing**

Jessica Robin<sup>1</sup>, Bradley R. Buchsbaum<sup>1,2</sup>, Rosanna K. Olsen<sup>1,2</sup>; <sup>1</sup>Rotman Research Institute, Baycrest, <sup>2</sup>University of Toronto  
Topic Area: ATTENTION: Other

**Poster E8            Investigating the Dynamics of Social Attention with a Gaze-Contingent Display using Recurrence-Quantification Analysis**

Aleya Flechsenhar<sup>1</sup>, Lara Roesler<sup>1</sup>, Matthias Gamer<sup>1</sup>; <sup>1</sup>Department of Experimental Clinical Psychology, University of Wuerzburg  
Topic Area: ATTENTION: Other

**Poster E9            Object-feature binding is maintained under dynamic shifts of spatial attention**

Emma Wu Dowd<sup>1</sup>, Julie D. Golomb<sup>1</sup>; <sup>1</sup>The Ohio State University  
Topic Area: ATTENTION: Spatial

**Poster E10          Facilitation and inhibition in selective attention: Two sides of the same coin?**

Heleen A. Slagter<sup>1</sup>, Dirk van Morselaar<sup>1</sup>; <sup>1</sup>University of Amsterdam  
Topic Area: ATTENTION: Spatial

**Poster E11          Localizing six bilateral sensory-biased regions in human frontal cortex.**

Abigail Noyce<sup>1</sup>, Sean Tobbyne<sup>1</sup>, Samantha Michalka<sup>2</sup>, Barbara Shinn-Cunningham<sup>1</sup>, David Somers<sup>1</sup>; <sup>1</sup>Boston University, <sup>2</sup>Olin College of Engineering  
Topic Area: ATTENTION: Multisensory

**Poster E12          Continuing Development in School-Age Children with Perinatal Stroke: Differing Degrees of Neuroplasticity for Language and Affect**

Philip Lai<sup>1</sup>; <sup>1</sup>University of Nebraska-Kearney  
Topic Area: EMOTION & SOCIAL: Development & aging

**Poster E13          Amygdala activation as a predictor of fragile X-associated tremor/ataxia syndrome onset**

Emily Fourie<sup>1</sup>, Annie Shelton<sup>1</sup>, David Hess<sup>1,2</sup>, Susan, M Rivera<sup>1,2</sup>; <sup>1</sup>University of California, Davis, <sup>2</sup>UC Davis MIND Institute  
Topic Area: EMOTION & SOCIAL: Development & aging

**Poster E14          Evidence for Individual Differences in Emotionally-Driven Pupillary Reactivity**

Connor Mckee<sup>1</sup>, Paola Tirado<sup>1</sup>, Justin Litvin<sup>1</sup>, Ivan Carbajal<sup>1</sup>, Anthony Ryals<sup>1</sup>; <sup>1</sup>University of North Texas  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster E15          Using Graph Theory to Uncover the Brain Network Organization Underlying Flow Experiences During a Semi-Naturalistic Behavioral Paradigm**

Richard Huskey<sup>1</sup>, Shelby Wilcox<sup>1</sup>, Rene Weber<sup>2,3</sup>; <sup>1</sup>School of Communication, The Ohio State University, <sup>2</sup>Department of Communication, University of California Santa Barbara, <sup>3</sup>Department of Psychological and Brain Sciences, University of California Santa Barbara  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster E16          Neurobiological Underpinnings of the Intersection between Emotion and Impulse Control in Adolescents**

Julia E. Cohen-Gilbert<sup>1,2</sup>, Lisa D. Nickerson<sup>1,2</sup>, Jennifer T. Sneider<sup>1,2</sup>, Emily N. Oot<sup>1,3</sup>, Anna M. Seraikas<sup>1</sup>, Maya Rieselbach<sup>1</sup>, Carolyn E. Caine<sup>1</sup>, Elena R. Stein<sup>1</sup>, Sion K. Harris<sup>1,4</sup>, Marisa M. Silveri<sup>1,2</sup>; <sup>1</sup>McLean Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Boston University School of Medicine, <sup>4</sup>Boston Children's Hospital  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster E17          Mental context reinstatement may underlie successful retrieval of extinction memories**

Augustin C. Hennings<sup>1</sup>, Jarrod A. Lewis-Peacock<sup>1</sup>, Joseph E. Dunsmoor<sup>1</sup>; <sup>1</sup>University of Texas at Austin  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster E18          Integration of reward with effort anticipation during performance monitoring revealed by ERPs and EEG spectra perturbations**

Davide Gheza<sup>1</sup>, Gilles Pourtois<sup>1</sup>; <sup>1</sup>Ghent University  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster E19          When the Emotional Stroop Task Does Not Produce a Stroop Effect in Adolescents**

Diana Rodriguez Moreno<sup>1</sup>, Yael M. Cycowicz<sup>1,2</sup>, Lawrence V. Amsel<sup>1,2</sup>, Zhishun Wang<sup>1,2</sup>, Xiaofu He<sup>1,2</sup>, Christina Hoven<sup>1,2</sup>; <sup>1</sup>New York State Psychiatric Institute, <sup>2</sup>Columbia University  
Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster E20 Inter-subject representational similarity analysis reveals individual variations in affective experience when watching erotic movies**

Pin-Hao Andy Chen<sup>1</sup>, Eshin Jolly<sup>1</sup>, Todd F. Heatherton<sup>1</sup>, Luke J. Chang<sup>1</sup>;  
<sup>1</sup>Dartmouth College

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster E21 Emotion recognition in pediatric brain tumor patients: viewing patterns and white matter structure**

Iska Moxon-Emre<sup>1,2,3</sup>, Eric Bouffet<sup>1</sup>, Suzanne Laughlin<sup>1</sup>, Jovanka Skocic<sup>1</sup>, Cynthia de Medeiros<sup>1</sup>, Donald J. Mabbott<sup>1,2</sup>; <sup>1</sup>The Hospital for Sick Children, <sup>2</sup>The University of Toronto, <sup>3</sup>Pediatric Oncology Group of Ontario

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster E22 Transcranial direct current stimulation modulate fear extinction-processes**

Martin Herrmann<sup>1</sup>, Natalie Dittert<sup>1</sup>, Thomas Polak<sup>1</sup>; <sup>1</sup>Department of Psychiatry, Psychosomatics and Psychotherapy, University Hospital Wuerzburg, Germany

Topic Area: EMOTION & SOCIAL: Other

**Poster E23 The Emotional Homunculus: Visual emotion discrimination and personality traits effects in somatosensory cortex**

Beatriz Calvo-Merino<sup>1</sup>, Irena Arslanova<sup>1</sup>, Vasiliki Meletaki<sup>1</sup>, Bettina Forster;  
<sup>1</sup>City, University of London, UK

Topic Area: EMOTION & SOCIAL: Person perception

**Poster E24 Individual differences in empathy, but not mentalizing, predict visual attention to naturalistic social stimuli**

Callie De La Cerda<sup>1</sup>, Ashley Frost<sup>1</sup>, Katherine Warnell<sup>1</sup>; <sup>1</sup>Texas State University

Topic Area: EMOTION & SOCIAL: Person perception

**Poster E25 The Importance of Vestibular and Proprioceptive Signals on Perspective-Taking**

Anastasia Pavlidou<sup>1</sup>, Maria Gallagher<sup>2</sup>, Elisa Raffaella Ferrè<sup>2</sup>, Christophe Lopez<sup>1</sup>; <sup>1</sup>Aix Marseille Univ, CNRS, LNIA, FR3C, Marseille, France, <sup>2</sup>Royal Holloway University of London, Egham, United Kingdom

Topic Area: EMOTION & SOCIAL: Self perception

**Poster E26 Cognitive flexibility tracks with dynamic transitions in intrinsic connectivity profiles**

Shruti Vij<sup>1</sup>, Lucina Uddin<sup>1,2</sup>; <sup>1</sup>Department of Psychology, University of Miami, <sup>2</sup>Neuroscience Program, University of Miami Miller School of Medicine

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster E27 Differential Effects of Maternal Exposures in Early Life on Working Memory Versus Inhibitory Control in Preschool-Aged Children**

Cassandra Svelnys<sup>1</sup>, Michaela Gusman<sup>1</sup>, Michelle Huevoz<sup>1</sup>, Andreina Tuccella<sup>1</sup>, Rosalind J. Wright<sup>3,4,5</sup>, Michelle Bosquet Enlow<sup>1,2</sup>; <sup>1</sup>Boston Children's Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Kravis Children's Hospital, New York, NY, <sup>4</sup>Mindich Child Health & Development Institute, New York, NY, <sup>5</sup>Icahn School of Medicine at Mount Sinai, New York, NY

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster E28 Longitudinal associations between conflict monitoring and emergent academic skills: an event-related potentials study**

Elif Isbell<sup>1</sup>, Susan Calkins<sup>1</sup>, Veronica Cole<sup>2</sup>, Margaret Swingler<sup>2</sup>, Esther Leerkes<sup>1</sup>; <sup>1</sup>University of North Carolina at Greensboro, <sup>2</sup>University of North Carolina at Chapel Hill

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster E29 Temporal information and trait impulsivity guide prefrontal preparatory activity**

Jacqueline R. Janowich<sup>1</sup>, James F. Cavanagh<sup>1</sup>; <sup>1</sup>University of New Mexico

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster E30 High-frequency alpha activity and its unsuccessful reduction in schizophrenia**

Kuk-In Jang<sup>1</sup>, Jihoon Oh<sup>1</sup>, Wookyoung Jung<sup>1</sup>, Sungkean Kim<sup>1</sup>, Sang Min Lee<sup>1</sup>, Seung Huh<sup>1</sup>, Seung-Hwan Lee<sup>1</sup>, Jeong-Ho Chae<sup>1</sup>; <sup>1</sup>The Catholic University of Korea

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster E31 Norepinephrine transporter phenotype impacts oscillatory power during cognitive flexibility**

Sara White<sup>1</sup>, Paolo Medrano<sup>1</sup>, Robert S. Ross<sup>1</sup>; <sup>1</sup>University of New Hampshire

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster E32 Effect of reward prospect on corticospinal excitability during task preparation is dependent on task and action requirements.**

Carsten Bundt<sup>1</sup>, Marcel Brass<sup>1</sup>, Wim Notebaert<sup>1</sup>; <sup>1</sup>Ghent University

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster E33 Effective connectivity in the cognitive control network**

Fan Zhang<sup>1,2</sup>, Sunao Iwaki<sup>2,1</sup>; <sup>1</sup>University of Tsukuba, <sup>2</sup>National Institute of Advanced Industrial Science and Technology

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster E34 Cross-language positive and negative priming effects reverse when priming manipulations proceed from L2 to L1, compared with L1 to L2**

Ewald Neumann<sup>1</sup>, Ivy Nkrumah<sup>2</sup>; <sup>1</sup>University of Canterbury, <sup>2</sup>University of Ivory Coast, Ghana

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster E35 Investigation of latent inhibitory control variables and aerobic fitness**

Daniel Westfall<sup>1</sup>, Lauren B. Raine<sup>1</sup>, Eric S. Drollette<sup>2</sup>, Mark R. Scudder<sup>3</sup>, Shih-Chun Kao<sup>1</sup>, Matthew B. Pontifex<sup>4</sup>, Arthur F. Kramer<sup>1,5</sup>, Charles H. Hillman<sup>1</sup>; <sup>1</sup>Northeastern University, Boston, Massachusetts, <sup>2</sup>The University of North Carolina at Greensboro, Greensboro, North Carolina, <sup>3</sup>University of Pittsburgh, Pittsburgh, Pennsylvania, <sup>4</sup>Michigan State University, East Lansing, Michigan, <sup>5</sup>University of Illinois, Urbana, Illinois

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster E36 Obesity is associated with lower executive function but inconspicuous prefrontal brain activity.**



Jennifer Beier<sup>1</sup>, Bodo Warrings<sup>1</sup>, Ann-Cathrin Koschker<sup>2</sup>, Andreas J Fallgatter<sup>3</sup>, Martin Fassnacht<sup>2</sup>, Martin J Herrmann<sup>1</sup>; <sup>1</sup>Department of Psychiatry, Psychosomatics and Psychotherapy, University Hospital Wuerzburg, Germany, <sup>2</sup>Department of Internal Medicine I, Division of Endocrinology and Diabetes, University Hospital, University of Wuerzburg, Wuerzburg, Germany, <sup>3</sup>Department of Psychiatry, University Hospital of Tübingen, Germany

Topic Area: EXECUTIVE PROCESSES: Other

**Poster E37 Reinforcement and Punishment Effects on Incentive Integration and Motivated Cognitive Control**

Debbie Yee<sup>1</sup>, Carolyn Dean Wolf<sup>2</sup>, Todd Braver<sup>1</sup>; <sup>1</sup>Washington University in St. Louis, <sup>2</sup>Brown University

Topic Area: EXECUTIVE PROCESSES: Other

**Poster E38 Retroactive attentional shifts predict performance in a working memory task: Evidence by lateralized EEG patterns**

Daniel Schneider<sup>1</sup>, Anna Barth<sup>1</sup>, Laura Klatt<sup>1</sup>, Edmund Wascher<sup>1</sup>; <sup>1</sup>Leibniz Research Centre for Working Environment and Human Factors

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster E39 Different dimensions of attended and unattended items are maintained in different states in visual working memory**

Qing Yu<sup>1</sup>, Bradley Postle<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster E40 Predicting cognitive performance on the basis of electrophysiological properties of resting state neuronal dynamics**

Elena Cesnaite<sup>1</sup>, Keyvan Mahjoory<sup>2</sup>, Arno Villringer<sup>1,3</sup>, Vadim V. Nikulin<sup>1,4</sup>;

<sup>1</sup>Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany, <sup>2</sup>Functional Brain Mapping Laboratory, Université Libre de Bruxelles, Brussels, Belgium, <sup>3</sup>Clinic for Cognitive Neurology, University of Leipzig, Leipzig, Germany, <sup>4</sup>Center for Cognition and Decision Making, National Research University Higher School of Economics, Russian Federation

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster E41 The acute effects of moderate-intensity aerobic exercise and high-intensity interval exercise on working memory**

Shih-Chun Kao<sup>1</sup>, Joseph Ritondale<sup>2</sup>, Keita Kamijo<sup>3</sup>, Eric Drollette<sup>4</sup>, Naiman Khan<sup>2</sup>, Charles Hillman<sup>1</sup>; <sup>1</sup>Northeastern University, <sup>2</sup>University of Illinois at Urbana-Champaign, <sup>3</sup>Wasada University, <sup>4</sup>University of North Carolina at Greensboro

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster E42 The relationship between theta oscillations and the function of working memory processes during reading comprehension**

Shelby Smith<sup>1</sup>, Anna Allen<sup>1</sup>, Kristin Ritchey<sup>1</sup>, Scott Wittman<sup>1</sup>, Caleb Robinson<sup>1</sup>, Tania Morales<sup>1</sup>, Charles Jackson<sup>1</sup>, Tyler Halbert<sup>1</sup>, Cori Conner<sup>1</sup>, Alaina Myers<sup>1</sup>, Kierstin Riels<sup>1</sup>, Austin Tatum<sup>1</sup>; <sup>1</sup>Ball State University

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster E43 Interactive, non-speech acoustic experience modulates theta, beta and gamma oscillatory responses to speech at 9-months-of-age**

Silvia Ortiz-Mantilla<sup>1</sup>, Teresa Realpe-Bonilla<sup>1</sup>, April A Benasich<sup>1</sup>; <sup>1</sup>Center for Molecular and Behavioral Neuroscience, Rutgers University Newark, NJ, USA

Topic Area: LANGUAGE: Development & aging

**Poster E44 A double-dissociation of semantic and phonological processing in young children**

Yael Weiss-Zruya<sup>1</sup>, Hannah G. Cweigenberg<sup>1</sup>, James R. Booth<sup>2</sup>; <sup>1</sup>The University of Texas at Austin, <sup>2</sup>Vanderbilt University

Topic Area: LANGUAGE: Development & aging

**Poster E45 Spatio-temporal granularity of dorsal stream processing during word production**

F.-Xavier Alario<sup>1</sup>, Catherine Liégeois-Chauvel<sup>2,3</sup>, Anne-Sophie Dubarry<sup>4</sup>, Irene Wang<sup>3</sup>, S Alomar<sup>3</sup>, Imad M. Najm<sup>3</sup>, Patrick Chauvel<sup>2,3</sup>, Jorge Gonzalez-Martinez<sup>3</sup>; <sup>1</sup>Aix Marseille Univ, CNRS, LPC, Marseille, France, <sup>2</sup>Aix Marseille Univ, INSERM, INS, Inst Neurosci Syst, Marseille, France, <sup>3</sup>Cleveland Clinic Foundation, Cleveland (OH), USA, <sup>4</sup>Aix Marseille Univ, CNRS, LPL, Aix-en-Provence, France

Topic Area: LANGUAGE: Lexicon

**Poster E46 ERPs reveal early feedforward orthographic and phonological selectivity during single word reading.**

Laurie S. Glezer<sup>1</sup>, Katherine J. Midgely<sup>1</sup>, Karen Emmorey<sup>1</sup>, Phillip J. Holcomb<sup>1</sup>; <sup>1</sup>San Diego State University

Topic Area: LANGUAGE: Other

**Poster E47 Orthographic priming by fingerspelled and printed letters**

Zed Sevcikova Sehyr<sup>1</sup>, Jamie Renna<sup>1</sup>, Katherine Midgley<sup>1</sup>, Karen Emmorey<sup>1</sup>, Philip Holcomb<sup>1</sup>; <sup>1</sup>San Diego State University

Topic Area: LANGUAGE: Other

**Poster E48 Functional Connectivity of Language and Memory as a Cognitive Biomarker in Temporal Lobe Epilepsy**

Elise Roger<sup>1</sup>, Cédric Pichat<sup>1</sup>, Marcela Perrone-Bertolotti<sup>1</sup>, Emilie Cousin<sup>1</sup>, Lorella Minotti<sup>2</sup>, Anne-Sophie Job<sup>2</sup>, Chrystèle Mosca<sup>2</sup>, Philippe Kahane<sup>2</sup>, Monica Baciui<sup>1</sup>; <sup>1</sup>Univ. Grenoble Alpes, CNRS LPNC UMR 5105, F-38000 Grenoble, France, <sup>2</sup>Univ. Grenoble Alpes, Grenoble Institute of Neuroscience & Neurology Department CHUGA, France

Topic Area: LANGUAGE: Other

**Poster E49 The relationship between a chaotic home environment and language processing in children**

Elisa Gallegos<sup>1</sup>, Julie Schneider<sup>1</sup>, Michael Lopez<sup>1</sup>, Yvonne Ralph<sup>1</sup>, Mandy J Maguire<sup>1</sup>; <sup>1</sup>University of Texas at Dallas

Topic Area: LANGUAGE: Other

**Poster E50 Language output monitoring in sign production: an electroencephalography study**

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Topic Area: LANGUAGE: Other

**Poster E51 Spatiotemporal Dissociations associated with Fulfilling and Violating Predictions at Multiple Levels of Representation: A multimodal approach**

Gina R. Kuperberg<sup>1,2</sup>, Lotte Schoot<sup>1,2</sup>, Lin Wang<sup>1,2</sup>, Edward Alexander<sup>2</sup>, Nate Delaney-Busch<sup>2</sup>, Eddie Wlotko<sup>2</sup>, Minjae Kim<sup>1,2</sup>, Lena Warnke<sup>2</sup>, Sheraz Kahn<sup>1</sup>, Matti Hamalainen<sup>1</sup>; <sup>1</sup>Martinos Center for Biomedical Imaging, Massachusetts General Hospital, <sup>2</sup>Tufts University  
Topic Area: LANGUAGE: Semantic

**Poster E52 Distinguishing semantic and social neural networks in neurotypicals and autism**

Hillary Levinson<sup>1</sup>, Miriam Rosenberg-Lee<sup>1</sup>, William Graves<sup>1</sup>; <sup>1</sup>Rutgers University  
Topic Area: LANGUAGE: Semantic

**Poster E53 The neural basis of verb and noun semantic representations in congenitally blind individuals**

Giulia V. Elli<sup>1</sup>, Rashi Pant<sup>1</sup>, Rebecca Achtman<sup>2</sup>, Marina Bedny<sup>1</sup>; <sup>1</sup>Johns Hopkins University, <sup>2</sup>DePauw University  
Topic Area: LANGUAGE: Semantic

**Poster E54 The neural encoding of thematic roles**

Jayden Ziegler<sup>1</sup>, Miriam Hauptman<sup>2</sup>, Jesse Snedeker<sup>1</sup>, Evelina Fedorenko<sup>3,4</sup>; <sup>1</sup>Harvard University, <sup>2</sup>Tufts University, <sup>3</sup>Harvard Medical School, <sup>4</sup>Massachusetts General Hospital  
Topic Area: LANGUAGE: Semantic

**Poster E55 Impaired metaphor comprehension in primary progressive aphasia**

Eileen Cardillo<sup>1</sup>, Nathaniel B. Klooster<sup>1</sup>, Marguerite McQuire<sup>1</sup>, Michael Bonner<sup>1</sup>, Charles Jester<sup>1</sup>, Murray Grossman<sup>1</sup>, Corey McMillan<sup>1</sup>, Anjan Chatterjee<sup>1</sup>; <sup>1</sup>University of Pennsylvania  
Topic Area: LANGUAGE: Semantic

**Poster E56 Language and music do and do not share the merging operations in syntax**

Tomomi Hida<sup>1</sup>, Hiroaki Mizuhara<sup>1</sup>; <sup>1</sup>Kyoto University  
Topic Area: LANGUAGE: Syntax

**Poster E57 Some Complex Concepts Require Language: An eye-tracking study with 12- to 24-mo-old infants and adults**

Ertugrul Uysal<sup>1</sup>, Mihye Choi<sup>1</sup>, Mohinish Shukla<sup>1</sup>; <sup>1</sup>University of Massachusetts Boston  
Topic Area: LANGUAGE: Syntax

**Poster E58 Direct brain recordings reveal prefrontal cortex dynamics of memory development**

Elizabeth Johnson<sup>1,2</sup>, Qin Yin<sup>2</sup>, Lingfei Tang<sup>2</sup>, Eishi Asano<sup>2</sup>, Noa Ofen<sup>2</sup>; <sup>1</sup>University of California, Berkeley, <sup>2</sup>Wayne State University  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster E59 Functional specialization of hippocampal subfields in young children**

Qijing Yu<sup>1</sup>, Sruthi Ramesh<sup>1</sup>, Bryn Thompson<sup>1</sup>, David Chen<sup>1</sup>, Mayu Nishimura<sup>1,2</sup>, Noa Ofen<sup>1</sup>; <sup>1</sup>Wayne State University, <sup>2</sup>McMaster University  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster E60 Human aging reduces the neurobehavioral influence of motivation on episodic memory**

Maiya Geddes<sup>1,2</sup>, Aaron T. Mattfeld<sup>2,3</sup>, Carlo de los Angeles<sup>2</sup>, Anisha Keshavan<sup>2,4,5</sup>, John D. E. Gabrieli<sup>2</sup>; <sup>1</sup>Brigham and Women's Hospital, Division of Cognitive and Behavioral Neurology, Harvard Medical School,

Boston, MA, USA, <sup>2</sup>Department of Brain and Cognitive Sciences and McGovern Institute for Brain Research, Massachusetts Institute of Technology, Cambridge, MA, USA, <sup>3</sup>Florida International University, Miami, FL, USA, <sup>4</sup>Department of Neurology, University of California, San Francisco, <sup>5</sup>Bioengineering Graduate Group, University of California, San Francisco and Berkeley  
Topic Area: LONG-TERM MEMORY: Development & aging

**Poster E61 Effects of aging on functional networks in the cortical midline structures underlying the self-reference effect by taking self-perspectives**

Takashi Tsukiura<sup>1</sup>, Karin Norimoto<sup>1</sup>, Rie Yamawaki<sup>1,2,3</sup>, Yayoi Shigemune<sup>1,4</sup>; <sup>1</sup>Graduate School of Human and Environmental Studies, Kyoto University, <sup>2</sup>Graduate School of Medicine, Kyoto University, <sup>3</sup>Kyoto University Hospital, <sup>4</sup>Graduate School of Letters, Chuo University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E62 Hippocampal theta phase coherence signals binding during retrieval and novelty processing**

Donna J. Bridge<sup>1</sup>, Christina M. Zelano<sup>1</sup>, Nathan Whitmore<sup>1</sup>, John Walker<sup>1</sup>, Josh Rosenow<sup>1</sup>, Stephan U Schuele<sup>1</sup>, Jessica W. Templar<sup>1</sup>, Joel L Voss<sup>1</sup>, Stephen A VanHaerents<sup>1</sup>; <sup>1</sup>Northwestern University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E63 Remembering emotional stimuli re-instantiates valence coding voxel-patterns from visual and temporal cortex**

Holly Bowen<sup>1</sup>, John Ksander<sup>2</sup>, Elizabeth Kensinger<sup>1</sup>; <sup>1</sup>Boston College, <sup>2</sup>Brandeis University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E64 High-resolution dynamic neural correlates and functional connectivity of autobiographical memory retrieval**

Charles Ferris<sup>1</sup>, Cory Inman<sup>1</sup>, G. Andrew James<sup>2</sup>, Stephan Hamann<sup>1</sup>; <sup>1</sup>Emory University, <sup>2</sup>University of Arkansas for Medical Sciences  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E65 Associative Recognition for Word Pairs in Temporarily Ambiguous Sentences: Behavioral and Electrophysiological Evidence**

Kathryn Bousquet<sup>1</sup>, Axel Mecklinger<sup>2</sup>, Debra Long<sup>1</sup>, Tamara Swaab<sup>1</sup>; <sup>1</sup>University of California, Davis, <sup>2</sup>Saarland University, Saarbrücken  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E66 Neurocognitive bases for the functional role of gaze direction during episodic memory retrieval**

Roger Johansson<sup>1</sup>, Inês Bramão<sup>1</sup>, Richard Dewhurst<sup>2</sup>, Mikael Johansson<sup>1</sup>; <sup>1</sup>Department of Psychology, Lund University, <sup>2</sup>School of Culture and Society, Aarhus University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E67 Targeted stimulation influences age-related changes in connectivity and function of hippocampal-cortical networks**

Aneesa Nilakantan<sup>1</sup>, John Walker<sup>1</sup>, Sandra Weintraub<sup>1</sup>, Stephen VanHaerents<sup>1</sup>, Donna Bridge<sup>1</sup>, M-Marsel Mesulam<sup>1</sup>, Joel Voss<sup>1</sup>; <sup>1</sup>Northwestern University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E68 Persistence of hippocampal activation patterns in post-encoding rest predicts subsequent voluntary, but not involuntary recall of distressing film clips**

Renee M. Visser<sup>1</sup>, Richard N. Henson<sup>1</sup>, Emily A. Holmes<sup>1,2</sup>; <sup>1</sup>Medical Research Council Cognition and Brain Sciences Unit, University of Cambridge, UK, <sup>2</sup>Karolinska Institutet, Stockholm, Sweden  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E69 Episodic simulations reveal the structure of affective representations in medial prefrontal cortex**

Philipp C. Paulus<sup>1</sup>, Ian Charest<sup>2</sup>, Roland G. Benoit<sup>1</sup>; <sup>1</sup>Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany, <sup>2</sup>University of Birmingham, UK  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E70 Prioritization of weakly-encoded information for sleep-dependent consolidation**

Dan Denis<sup>1,2</sup>, Verda Bursal<sup>1,2</sup>, Shanice Oquin<sup>1,2</sup>, Alexandra Morgan<sup>1,2</sup>, Robert Stickgold<sup>1,2</sup>; <sup>1</sup>Beth Israel Deaconess Medical Center, <sup>2</sup>Harvard Medical School  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E71 Dynamics of brain activity reveal a unitary recognition signal**

Christoph T. Weidemann<sup>1,2</sup>, Michael J. Kahana<sup>2</sup>; <sup>1</sup>Swansea University, Wales, UK, <sup>2</sup>University of Pennsylvania  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E72 Characterizing EEG signatures of inattention that predict forgetting**

David DiStefano<sup>1</sup>, Helen Schmidt<sup>1</sup>, Paige Hickey<sup>1</sup>, Elizabeth Race<sup>1</sup>; <sup>1</sup>Tufts University  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E73 Mental Chronometry of Episodic Memory Retrieval**

Logan J. Fickling<sup>1</sup>, Michael J. Kahana<sup>1</sup>; <sup>1</sup>University of Pennsylvania  
Topic Area: LONG-TERM MEMORY: Episodic

**Poster E74 Awake Targeted Memory Reactivation and Foreign Language Learning**

Linda J. Hoffman<sup>1</sup>, Kylie H. Alm<sup>2</sup>, Chi T. Ngo<sup>1</sup>, Ingrid R. Olson<sup>1</sup>; <sup>1</sup>Temple University, <sup>2</sup>Johns Hopkins University  
Topic Area: LONG-TERM MEMORY: Other

**Poster E75 Investigating the Neural Bases of Featured-Based Semantic Control: Evidence from High Resolution Functional Neuroimaging**

Andrew C. Connolly<sup>1</sup>, Gavin K. Hanson<sup>2</sup>, Evangelia G. Chrysiakou<sup>3</sup>; <sup>1</sup>Dartmouth School of Medicine, <sup>2</sup>Case Western Reserve, <sup>3</sup>University of Kansas  
Topic Area: LONG-TERM MEMORY: Semantic

**Poster E76 The conflicting outcomes of the organizational processing on test-potentiated learning.**

SinYi Wang<sup>1</sup>, ShihKuen Cheng<sup>1</sup>; <sup>1</sup>National Central University  
Topic Area: LONG-TERM MEMORY: Semantic

**Poster E77 Age-related differences in the underlying mechanisms of temporal statistical learning**

Noémi Elteto<sup>1</sup>, Karolina Janacsek<sup>1,2</sup>, Dezso Nemeth<sup>1,2</sup>; <sup>1</sup>Eotvos Lorand University, Budapest, Hungary, <sup>2</sup>Brain, Memory and Language Lab, Hungarian Academy of Sciences, Budapest, Hungary  
Topic Area: LONG-TERM MEMORY: Skill learning

**Poster E79 Calibrating Atypical Timing in Clinical Populations Through Music**

Lisa Hirt<sup>1</sup>, Lara Pantlin<sup>1</sup>; <sup>1</sup>Colorado State University  
Topic Area: METHODS: Electrophysiology

**Poster E80 Anterior-Posterior Insular Segmentation of FreeSurfer Generated Region-of-Interest Volume**

Brittany Strauss<sup>1</sup>, Todd D'Amour<sup>1</sup>, Jeremy D. Cohen<sup>1</sup>; <sup>1</sup>Xavier University of Louisiana, New Orleans, LA, USA  
Topic Area: METHODS: Neuroimaging

**Poster E81 The limits of behavioural outcome prediction following focal brain injury**

Tianbo Xu<sup>1</sup>, Ashwani Jha<sup>1,2</sup>, Hans Rolf Jager<sup>1,2</sup>, Michel Thiebaut de Schotten<sup>6,7</sup>, Geraint Rees<sup>1,3,4,5</sup>, Parashkev Nachev<sup>1,2</sup>; <sup>1</sup>Institute of Neurology, UCL, London, WC1N 3BG, UK., <sup>2</sup>National Hospital for Neurology and Neurosurgery, Queen Square, UK., <sup>3</sup>Institute of Cognitive Neuroscience, UCL, London WC1N 3AR, UK., <sup>4</sup>Faculty of Life Sciences, UCL, London, WC1E 6BT, UK., <sup>5</sup>Wellcome Trust Centre for Neuroimaging, UCL, London WC1N 3BG, UK., <sup>6</sup>Brain Connectivity Behaviour group, Paris, France, <sup>7</sup>Sorbonne Universités, UPMC Univ Paris 06, Inserm, CNRS, Institut du cerveau et la moelle (ICM) - Hôpital Pitié-Salpêtrière, Boulevard de l'hôpital, F-75013, Paris, France  
Topic Area: METHODS: Neuroimaging

**Poster E82 Multimodal structural predictors of naming therapy outcomes in persons with aphasia**

Erin Meier<sup>1</sup>, Jeffrey Johnson<sup>1</sup>, Yue Pan<sup>1</sup>, Maria Dekhtyar<sup>1</sup>, Swathi Kiran<sup>1</sup>; <sup>1</sup>Boston University  
Topic Area: METHODS: Neuroimaging

**Poster E83 SHARP (Strengthening Human Adaptive Reasoning and Problem Solving): A case study for highlighting the role of independent test and evaluation in government funded research**

Dimitrios Donavos<sup>1</sup>, Alexis Jeannotte<sup>2</sup>, Amber Sprenger<sup>3</sup>, Chrissy Thuy-Diem Vu<sup>3</sup>; <sup>1</sup>Booz Allen Hamilton, <sup>2</sup>IARPA/ODNI (US Government), <sup>3</sup>MITRE Corporation  
Topic Area: METHODS: Other

**Poster E85 Context-dependent selective role of the left medial prefrontal cortex in communication: a TMS study**

Beatriz Martin-Luengo<sup>1</sup>, Matteo Feurra<sup>1</sup>, Alicia Vorobiova<sup>1</sup>, Andriy Myachykov<sup>1,2</sup>, Yury Shtyrov<sup>1,3,4</sup>; <sup>1</sup>National Research University - Higher School of Economics, <sup>2</sup>Northumbria University, <sup>3</sup>Aarhus University, <sup>4</sup>Saint Petersburg State University  
Topic Area: OTHER

**Poster E86 Statistical learning of nonadjacent dependencies among different modalities**

Yu-Huei Lian<sup>1</sup>, Kunyu Xu<sup>1</sup>, Denise H. Wu<sup>1</sup>; <sup>1</sup>National Central University  
Topic Area: OTHER

**Poster E87 Similar motor-related sensory attenuation for tones and voices**

Ana Pinheiro<sup>1</sup>, Michael Schwartze<sup>2</sup>, Sonja A. Kotz<sup>2</sup>; <sup>1</sup>Voice, Affect and Speech Laboratory, Faculty of Psychology, University of Lisbon, Lisbon, Portugal, <sup>2</sup>Basic and Applied NeuroDynamics Laboratory, Faculty of Psychology and Neuroscience, Department of Neuropsychology and Psychopharmacology, Maastricht University, Maastricht, The Netherlands  
Topic Area: PERCEPTION & ACTION: Audition

**Poster E88 Time-Frequency Effects of Syntactic Violation in Music, Language, and Rhythm**

Juho Daniel Lee<sup>1</sup>, Harim Jung<sup>1</sup>, Christine Mathew<sup>1</sup>, Psyche Loui<sup>1</sup>; <sup>1</sup>Wesleyan University  
Topic Area: PERCEPTION & ACTION: Audition

**Poster E89 Developmental perceptual impairments: when tone-deafness and prosopagnosia co-occur**

Sebastien Paquette<sup>1</sup>, Hui Charles Li<sup>1</sup>, Stephanie Buss<sup>1</sup>, Gottfried Schlaug<sup>1</sup>; <sup>1</sup>Music and Neuroimaging Laboratory, Beth Israel Deaconess Medical Center, Harvard Medical School  
Topic Area: PERCEPTION & ACTION: Audition

**Poster E90 Statistical learning of categorical regularities in adults and children**

Yaelan Jung<sup>1</sup>, Dirk B. Walther<sup>1</sup>, Amy S. Finn<sup>1</sup>; <sup>1</sup>University of Toronto  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster E91 Reward processing during dyadic social interaction: An EEG study of parents and young children**

Julia Anna Adrian<sup>1</sup>, Kevin Jensen<sup>1</sup>, Alvin Li<sup>1</sup>, Scott Makeig<sup>2</sup>, Gedeon Deak<sup>1</sup>; <sup>1</sup>UC San Diego, Cognitive Science, <sup>2</sup>Swartz Center for Computational Neuroscience  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster E92 Electrocorticographic dissociation of alpha- and beta-band activity in human sensorimotor cortex**

Arjen Stolk<sup>1</sup>, Loek Brinkman<sup>2</sup>, Mariska van Steensel<sup>2</sup>, Erik Aarnoutse<sup>2</sup>, Robert T. Knight<sup>1</sup>, Frans Leijten<sup>2</sup>, Floris de Lange<sup>3</sup>, Ivan Toni<sup>3</sup>; <sup>1</sup>University of California, Berkeley, <sup>2</sup>Utrecht University, <sup>3</sup>Donders Institute  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster E93 Association between Unintentional Interpersonal Postural Coordination Produced by Interpersonal Light Touch and the Intensity of Social Relationship**

Tomoya Ishigaki<sup>1,2,3</sup>, Ryota Imai<sup>1</sup>, Shu Morioka<sup>1</sup>; <sup>1</sup>Kio University, <sup>2</sup>Fit-care Home-visit Nursing Station, <sup>3</sup>Higashiikoma Hospital  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster E94 Neural correlates of executed and imagined joystick directional movements: A functional near-infrared spectroscopy study**

Matthew A. Mathison<sup>1</sup>, Donald C. Rojas<sup>1</sup>; <sup>1</sup>Colorado State University  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster E95 Seen and heard emotions alter perception and cortisol**

Vivian M. Ciaramitaro<sup>1</sup>, Sarah C. Izen<sup>1</sup>, Hannah E. Lapp<sup>1</sup>, Daniel A. Harris<sup>2</sup>, Richard G. Hunter<sup>1</sup>; <sup>1</sup>University of Massachusetts Boston, Dept of Psychology, Developmental and Brain Sciences Program, <sup>2</sup>Brown University, School of Public Health

Topic Area: PERCEPTION & ACTION: Multisensory

**Poster E96 Boosting auditory pitch learning with unconscious visual information**

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Topic Area: PERCEPTION & ACTION: Multisensory

**Poster E97 Silent lip reading generates speech signals in auditory cortex**

Karthikeyan Ganesan<sup>1</sup>, Jacob Zweig<sup>2</sup>, Marcia Grabowecky<sup>2</sup>, Satoru Suzuki<sup>2</sup>, Vernon Towle<sup>3</sup>, James Tao<sup>3</sup>, Shasha Wu<sup>3</sup>, David Brang<sup>1</sup>; <sup>1</sup>University of Michigan, <sup>2</sup>Northwestern University, <sup>3</sup>University of Chicago  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster E98 Responsivity of a human mirror neuron system to the transitivity of an action when the end result of a movement is visible but not when it is obscured**

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Topic Area: PERCEPTION & ACTION: Other

**Poster E99 Electroretinographic Markers of NMDA-dependent Functions in Healthy Controls and Patients with Schizophrenia**

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Topic Area: PERCEPTION & ACTION: Vision

**Poster E100 A search for the representational content in the putative number form area**

Darren Yeo<sup>1,2</sup>, Courtney Pollack<sup>1</sup>, Gavin Price<sup>1</sup>; <sup>1</sup>Peabody College, Vanderbilt University, USA, <sup>2</sup>Nanyang Technological University, Singapore  
Topic Area: PERCEPTION & ACTION: Vision

**Poster E101 Eccentricity-dependent gradient in neural suppression in the primary visual cortex.**

Akari Nagashima<sup>1</sup>, Yasuo Nakai<sup>1,2</sup>, Akane Hayakawa<sup>1</sup>, Takuya Osuki<sup>1</sup>, Jeong-won Jeong<sup>1</sup>, Ayaka Sugiura<sup>1</sup>, Erik C Brown<sup>3</sup>, Eishi Asano<sup>1</sup>; <sup>1</sup>Wayne State University, <sup>2</sup>Wakayama Medical University, <sup>3</sup>Oregon Health and Science University  
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**Poster E102 Structural connections differ for central vs. peripheral V1**

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Topic Area: PERCEPTION & ACTION: Vision

**Poster E103 Unconscious number discrimination in the human visual system**

Ché Lucero<sup>1,2</sup>, Geoffrey Brookshire<sup>2</sup>, Colin Quirk<sup>2</sup>, Susan Goldin-Meadow<sup>2</sup>, Edward Vogel<sup>2</sup>, Daniel Casasanto<sup>1,2</sup>; <sup>1</sup>Cornell University, <sup>2</sup>The University of Chicago  
Topic Area: PERCEPTION & ACTION: Vision

**Poster E104 Naturalistic decision-making dynamics in spiking neuron circuits**

John C. Ksander<sup>1</sup>, Donald B. Katz<sup>1</sup>, Paul Miller<sup>1</sup>; <sup>1</sup>Brandeis University

Topic Area: THINKING: Decision making

**Poster E105 Attentional Differences and Estimation Frame Incongruence Predict Bias in Economic Judgments**

Kylie Fernandez<sup>1</sup>, Joseph Schmidt<sup>1</sup>, Camelia Kuhnen<sup>2</sup>, Nichole Lighthall<sup>1</sup>;  
<sup>1</sup>University of Central Florida, <sup>2</sup>UNC Kenan-Flagler Business School  
Topic Area: THINKING: Decision making

**Poster E106 An Altered Cortico-Basal Ganglia Network Activation during Reward Anticipation in Multiple Sclerosis**

Pei-Pei Liu<sup>1</sup>, Angela Spirou<sup>1</sup>, Eliane Neuteboom<sup>1</sup>, Ekaterina Dobryakova<sup>1</sup>;  
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**Poster E107 A behavioral and neural study of motivations for deception**

Anastasia Shuster<sup>1</sup>, Dino Levy<sup>1</sup>; <sup>1</sup>Tel Aviv University  
Topic Area: THINKING: Decision making

**Poster E108 The cingulum as an important measure of individual difference in brain development**

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Topic Area: THINKING: Development & aging

**Poster E109 How Does the Brain Compose Mental Images?**

Dillon Plunkett<sup>1</sup>, Joshua D. Greene<sup>1</sup>; <sup>1</sup>Harvard University  
Topic Area: THINKING: Other

**Poster E110 Quality of perceptual categories predict speeded, but not non-speeded, cognitive ability**

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Topic Area: THINKING: Problem solving

**Poster E111 ANS acuity, math achievement, and dyscalculia: Evidence for a domain-specific executive function relation**

Eric Wilkey<sup>1</sup>, Courtney Pollack<sup>1</sup>, Gavin R. Price<sup>1</sup>; <sup>1</sup>Department of Psychology & Human Development, Peabody College Vanderbilt University  
Topic Area: THINKING: Reasoning

**Poster E112 Visual Prediction of Novel Objects as a Function of Preparation Time, Temporal Expectancy, and Hemispheric Lateralization**

Cybelle M. Smith<sup>1</sup>, Kara D. Federmeier<sup>1</sup>; <sup>1</sup>University of Illinois, Urbana-Champaign  
Topic Area: LONG-TERM MEMORY: Priming

**Poster E114 Neural correlates of self-generation and verbal memory performance during paired-associate learning**

Sangeeta Nair<sup>1</sup>, Jane B Allendorfer<sup>1</sup>, Rodolphe Nenert<sup>1</sup>, Amber N Martin<sup>1</sup>, Daniel Mirman<sup>1</sup>, Jennifer Vannest<sup>2</sup>, Jerzy P Szaflarski<sup>1</sup>; <sup>1</sup>University of Alabama at Birmingham, <sup>2</sup>Cincinnati Childrens Hospital  
Topic Area: LONG-TERM MEMORY: Semantic

**Poster E115 Age-Related Deficits in Feedback-Based Cognitive Sequence Learning Among Healthy Older Adults**

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**Poster E116 Reliability of the Mismatch Negativity in a Kindergarten Population Oversampled for Dyslexia Risk**

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Topic Area: METHODS: Electrophysiology

**Poster E117 A Face-name Association Task fMRI for Mapping Memory Networks in Epilepsy Patients**

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Topic Area: METHODS: Neuroimaging

**Poster E118 Determining the functional anatomy of the human brain by using a combined VLSM and Bayesian network analysis approach**

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Topic Area: METHODS: Neuroimaging

**Poster E119 Fiber Tract Asymmetry: A novel approach to assessing white matter integrity with Diffusion Tensor Imaging (DTI)**

Ansgar Furst<sup>1,2</sup>, Andrei Vakhtin<sup>1,2</sup>, Miguel T. Robinson<sup>1</sup>, Dana Waltzman<sup>3</sup>, Max Wintermark<sup>2,1</sup>, Wesson J. Ashford<sup>1,2</sup>; <sup>1</sup>Veterans Affairs Palo Alto Health Care System, <sup>2</sup>Stanford University, <sup>3</sup>Centers for Disease Control and Prevention  
Topic Area: METHODS: Neuroimaging

**Poster E120 Fractional Anisotropy Asymmetries of White Matter Tracts in Traumatic Brain Injury**

Andrei A. Vakhtin<sup>1,2</sup>, Wesson J. Ashford<sup>1,2</sup>, Miguel T. Robinson<sup>1</sup>, Dana Waltzman<sup>3</sup>, Max Wintermark<sup>2,1</sup>, Ansgar J. Furst<sup>1,2</sup>; <sup>1</sup>Veterans Affairs Palo Alto Health Care, <sup>2</sup>Stanford University, <sup>3</sup>Centers for Disease Control and Prevention  
Topic Area: METHODS: Neuroimaging

**Poster E121 Data-driven subgrouping of task-based and resting state fMRI timeseries**

Jonathan T. Parsons<sup>1</sup>, Kathleen M. Gates<sup>1</sup>, Joseph B. Hopfinger<sup>1</sup>; <sup>1</sup>University of North Carolina at Chapel Hill  
Topic Area: METHODS: Neuroimaging

**Poster E122 Mechanisms of Timing: An integrative theoretical approach**

Lara Pantlin<sup>1</sup>, Mark Prince<sup>1</sup>, Deana Davalos<sup>1</sup>; <sup>1</sup>Colorado State University

Topic Area: METHODS: Other

**Poster E123 Estimating the Memory and Cognitive Capabilities of Time-Delayed Neural Structures**

Yosef Tirat-Gefen<sup>1,2</sup>; <sup>1</sup>George Mason University, <sup>2</sup>MaxWave Research LLC  
Topic Area: OTHER

**Poster E124 Neurocognitive markers of suicidal ideation**

Alex Mitko<sup>1,4</sup>, Regina McGlinchey<sup>1,2,4</sup>, Melissa Amick<sup>1,3,4</sup>, Michael Esterman<sup>1,3,4</sup>; <sup>1</sup>VA Boston Healthcare System, <sup>2</sup>Harvard Medical School, <sup>3</sup>Boston University School of Medicine, <sup>4</sup>Translational Research Center for TBI and Stress Disorders (TRACTS)  
Topic Area: OTHER

**Poster E125 Funding opportunities at the National Science Foundation**

Uri Hasson<sup>1</sup>; <sup>1</sup>National Science Foundation  
Topic Area: OTHER

**Poster E126 Predictability and Repetition in Sound: Characterising the Sustained EEG Response to Regularity**

Rosy Southwell<sup>1</sup>, Candida Tufo<sup>1</sup>, Maria Chait<sup>1</sup>; <sup>1</sup>University College London  
Topic Area: PERCEPTION & ACTION: Audition

**Poster E127 Statistical Learning and Gestalt-like Principles Predict Human Melodic Expectations**

Aniruddh Patel<sup>1</sup>, Emily Morgan<sup>1</sup>, Allison Fogel<sup>1</sup>; <sup>1</sup>Tufts University  
Topic Area: PERCEPTION & ACTION: Audition

**Poster E128 Behavioral and ERP Correlates of Declined Sensorimotor Control of Speech Production With Ageing**

Jingting Li<sup>1</sup>, Hanjun Liu<sup>1</sup>; <sup>1</sup>The First Affiliated Hospital, Sun Yat-sen University  
Topic Area: PERCEPTION & ACTION: Development & aging

**Poster E129 The development of planning in tool use: EEG, eye tracking, motion tracking, and video**

Ori Ossmy<sup>1</sup>, Brianna Kaplan<sup>1</sup>, Danyang Han<sup>1</sup>, Melody Xu<sup>1</sup>, Karen Adolph<sup>1</sup>; <sup>1</sup>New York University  
Topic Area: PERCEPTION & ACTION: Development & aging

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## Poster Session F

Tuesday, March 27, 8:00-10:00 am

**Poster F1 Individual Differences in Neural Representations of Semantic Content**

Katherine L. Alfred<sup>1</sup>, Justin C. Hayes<sup>1</sup>, Rachel G. Pizzie<sup>1</sup>, David J. M. Kraemer<sup>1</sup>; <sup>1</sup>Dartmouth College  
Topic Area: THINKING: Reasoning

**Poster F2 Prior knowledge guides speech segregation in human auditory cortex**

Yuanye Wang<sup>1,2,3</sup>, Jianfeng Zhang<sup>4</sup>, Jiajie Zou<sup>4</sup>, Huan Luo<sup>1,2,3</sup>, Nai Ding<sup>4,5,6,7</sup>; <sup>1</sup>School of Psychological and Cognitive Sciences, Peking University,

<sup>2</sup>McGovern Institute for Brain Research, Peking University, <sup>3</sup>Beijing Key Laboratory of Behavior and Mental Health, Peking University, <sup>4</sup>College of Biomedical Engineering and Instrument Sciences, Zhejiang University, <sup>5</sup>Key Laboratory for Biomedical Engineering of Ministry of Education, Zhejiang University, Zhejiang Univ, Hangzhou, China, <sup>6</sup>State Key Laboratory of Industrial Control Technology, Zhejiang University, Hangzhou, China, <sup>7</sup>Interdisciplinary Center for Social Sciences, Zhejiang University, Hangzhou, China # These authors contribute equally  
Topic Area: ATTENTION: Auditory

**Poster F3 Mobile EEG in a complex driving simulation – evaluating the effect of age on cognitive states**

Julian Elias Reiser<sup>1</sup>, Marlene Pacharra<sup>1</sup>, Stephan Getzmann<sup>1</sup>, Edmund Wascher<sup>1</sup>; <sup>1</sup>Leibniz Research Centre for Working Environment and Human Factors  
Topic Area: ATTENTION: Development & aging

**Poster F4 Integrating modality-specific expectancies for the deployment of spatial attention**

Paola Mengotti<sup>1</sup>, Frank Boers<sup>1</sup>, Pascasie L. Dombert<sup>1</sup>, Gereon R. Fink<sup>1,2</sup>, Simone Vossel<sup>1,3</sup>; <sup>1</sup>Research Centre Juelich, Germany, <sup>2</sup>University Hospital Cologne, Germany, <sup>3</sup>University of Cologne, Germany  
Topic Area: ATTENTION: Multisensory

**Poster F5 Neural Mechanisms Underlying the Interactive Relationship between Working Memory and Cognitive Control During Conflict Processing**

Khoi Vo<sup>1</sup>, Elise Demeret<sup>2</sup>, Tobias Egner<sup>1</sup>, Marty Woldorff<sup>1</sup>; <sup>1</sup>Duke University, <sup>2</sup>University of North Carolina Charlotte  
Topic Area: ATTENTION: Nonspatial

**Poster F6 Individual peak alpha frequency in touch – cognitive and methodological implications**

Alexander Jones<sup>1</sup>, Jonathan Silas<sup>1</sup>; <sup>1</sup>Middlesex University London  
Topic Area: ATTENTION: Other

**Poster F7 An Investigation of Brain-to-Brain Coherence in the Prefrontal Cortex During Joint Sentence Reading and Joint Fluid Reasoning Tasks**

Murat Perit Cakir<sup>1</sup>, Erdinç İşbilir<sup>1</sup>, Çağatay Taşcı<sup>1</sup>; <sup>1</sup>Middle East Technical University  
Topic Area: ATTENTION: Other

**Poster F8 Attentional bias toward fearful facial expressions: EEG correlates in theta oscillations**

Robert D. Torrence<sup>1</sup>, Lucy J. Troup<sup>1,2</sup>, Donald C. Rojas<sup>1</sup>; <sup>1</sup>Colorado State University, <sup>2</sup>University of the West of Scotland  
Topic Area: ATTENTION: Spatial

**Poster F9 Combining eye-tracking and EEG to measure attention to salient and emotional stimuli**

Louisa Kulke<sup>1,2,3</sup>, Janette Atkinson<sup>3,4</sup>, Oliver Braddick<sup>4</sup>, Annekathrin Schacht<sup>1,2</sup>; <sup>1</sup>University of Göttingen, <sup>2</sup>Leibniz-ScienceCampus Primate Cognition, <sup>3</sup>University College London, <sup>4</sup>University of Oxford  
Topic Area: ATTENTION: Spatial

**Poster F10 Alterations in Intrinsic Functional Brain Connectivity for Hypertensive Women Post-Menopause**

Judith Lobo<sup>1</sup>, Nicole Rotkowitz<sup>1</sup>, Julia Weinman<sup>1</sup>, Roger McIntosh<sup>1</sup>;  
<sup>1</sup>University of Miami

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster F11 Brain activation during thoughts of one's own death and its association with the fear of death in older adults**

Kanan Hirano<sup>1</sup>, Kentaro Oba<sup>1</sup>, Toshiki Saito<sup>1</sup>, Shohei Yamazaki<sup>1</sup>, Ryuta Kawashima<sup>1</sup>, Motoaki Sugiura<sup>1</sup>; <sup>1</sup>Tohoku University

Topic Area: EMOTION & SOCIAL: Development & aging

**Poster F12 Trait affective empathy mediates the relations between intrinsic default network functional connectivity and subjective happiness**

Yuta Katsumi<sup>1</sup>, Natsumi Kondo<sup>2</sup>, Sanda Dolcos<sup>1</sup>, Florin Dolcos<sup>1</sup>, Takashi Tsukiura<sup>2</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign, <sup>2</sup>Kyoto University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster F13 Neurocognitive and emotion processing deficits in Bipolar Disorder and their first degree relatives**

Hugo Sandoval<sup>1</sup>, Jose Gavito<sup>1</sup>, Christopher Dodoo<sup>2</sup>, Michael Escamilla<sup>3</sup>;  
<sup>1</sup>Texas Tech PLFSOM El Paso Radiology, <sup>2</sup>Texas Tech PLFSOM El Paso Biostatistics and Epidemiology, <sup>3</sup>Texas Tech PLFSOM El Paso Psychiatry

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster F14 Believing, Desiring, or Just Thinking About: Toward a Neuroscientific Account of Propositional Attitudes**

Regan Bernhard<sup>1</sup>, Steven Frankland<sup>1</sup>, Joshua Greene<sup>1</sup>; <sup>1</sup>Harvard University

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster F15 Building an Effective Math Anxiety Intervention: Understanding the Role of Emotion Regulation**

Rachel Pizzie<sup>1</sup>, David J. M. Kraemer<sup>1</sup>; <sup>1</sup>Dartmouth College

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster F16 Neural correlates of emotional inhibitory control in adolescents with and without family history of alcoholism**

Maya Rieselbach<sup>1</sup>, Lisa D. Nickerson<sup>1,3</sup>, Jennifer T. Sneider<sup>1,3</sup>, Anna Seraikas<sup>1</sup>, Emily Oot<sup>1,4</sup>, Carolyn Caine<sup>1</sup>, Elena Stein<sup>1</sup>, Sion K. Harris<sup>2</sup>, Marisa M. Silveri<sup>1,3,4</sup>, Julia E. Cohen-Gilbert<sup>1,3</sup>; <sup>1</sup>McLean Hospital, <sup>2</sup>Boston Children's Hospital, <sup>3</sup>Harvard Medical School, <sup>4</sup>Boston University School of Medicine

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster F17 Neuro-behavioral mechanisms of resilience against anxiety: An integrative brain-personality-behavior approach using structural equation modeling**

Sanda Dolcos<sup>1</sup>, Matthew Moore<sup>1</sup>, Steven Culpepper<sup>1</sup>, K. Luan Phan<sup>2</sup>, Florin Dolcos<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign, <sup>2</sup>University of Illinois at Chicago

Topic Area: EMOTION & SOCIAL: Emotion-cognition interactions

**Poster F18 Common Neural Correlates of Empathy and Worry when Processing Fearful Human Faces**

Lindsay Knight<sup>1</sup>, Teodora Stoica<sup>1</sup>, Farah Naaz<sup>1</sup>, Nicholas Fogleman<sup>1</sup>, Brendan Depue<sup>1</sup>; <sup>1</sup>University of Louisville

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster F19 Weakened adaptation for negative compared to positive emotions in individuals high in social anxiety**

Erinda Morina<sup>1</sup>, Sarah C. Izen<sup>1</sup>, Vivian M. Ciaramitaro<sup>1</sup>; <sup>1</sup>University of Massachusetts Boston

Topic Area: EMOTION & SOCIAL: Emotional responding

**Poster F20 Differential Sensitivity to Reward and Punishment in East Asians vs. Western Europeans**

Ramiro Eduardo Rea Reyes<sup>1</sup>, Youngbin Kwak<sup>1</sup>, JaeHyung Kwon<sup>2</sup>, Jaeseung Jeaong<sup>2</sup>; <sup>1</sup>University of Massachusetts, Amherst, <sup>2</sup>Korea Advanced Institute of Science and Technology

Topic Area: EMOTION & SOCIAL: Other

**Poster F21 Sex-related differences in behavioral and neural processing of facial threat cues via magnocellular and parvocellular pathways.**

Hee Yeon Im<sup>1,2</sup>, Reginald Adams, Jr<sup>3</sup>, Cody Cushing<sup>1</sup>, Jasmine Boshyan<sup>1,2</sup>, Noreen Ward<sup>1</sup>, Kestutis Kveraga<sup>1,2</sup>; <sup>1</sup>Massachusetts General Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>The Pennsylvania State University

Topic Area: EMOTION & SOCIAL: Person perception

**Poster F22 SCHIZOPHRENIA AND STIGMA: AN ERP STUDY**

Denice Vidals<sup>1</sup>, Jayden Zeng<sup>1</sup>, Lorraine Singh<sup>1</sup>, Brianna Riviezzo<sup>1</sup>, Jill Grose-Fifer<sup>1,2</sup>; <sup>1</sup>John Jay College of Criminal Justice, CUNY, <sup>2</sup>The Graduate Center, CUNY

Topic Area: EMOTION & SOCIAL: Person perception

**Poster F23 Freewill and the Self: A Transcranial Magnetic Stimulation Study of Libet's Postulate**

Julian Paul Keenan<sup>1</sup>, Olivia Tarrío<sup>1</sup>, Briana Goncalves<sup>1</sup>, Saeed Yasin<sup>1</sup>, Heather Soder<sup>2</sup>; <sup>1</sup>Montclair State University, <sup>2</sup>University of Texas

Topic Area: EMOTION & SOCIAL: Self perception

**Poster F24 Characterizing the neural basis of adolescent cognitive control using connectome-based predictive modeling**

Raihyung Lee<sup>1</sup>, Seyul Kwak<sup>1</sup>, Dasom Lee<sup>1</sup>, Jeanyung Chey<sup>1</sup>; <sup>1</sup>Seoul National University

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster F25 Functional and structural connectivity of cognitive control networks during narrative comprehension from birth to 9 years**

Rola Farah<sup>1</sup>, Tzipi Horowitz-Kraus<sup>1,2</sup>; <sup>1</sup>Technion- Israel Institute of Technology, <sup>2</sup>Cincinnati Childrens Hospital Medical Center

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster F26 Conflict Control on Emotional and Non-emotional Conflicts in Preadolescent Children**

Tongran Liu<sup>1,2</sup>, Xiuying Liu<sup>1,2</sup>, Danfeng Li<sup>1,2</sup>, Jiannong Shi<sup>1,2</sup>; <sup>1</sup>CAS Key Laboratory of Behavioral Science, Institute of Psychology, Chinese Academy of Sciences, China, <sup>2</sup>Department of Psychology, University of Chinese Academy of Sciences, China

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster F27 Relations between catechol-O-methyltransferase (COMT) genotype and inhibitory control development in childhood**

Maureen Bowers<sup>1</sup>, George Buzzell<sup>1</sup>, Virginia Salo<sup>1</sup>, Troller-Renfree Sonya<sup>1</sup>, Hodgkinson Colin<sup>2</sup>, Goldman David<sup>2</sup>, Gorodetsky Elena<sup>3</sup>, McDermott Jennifer<sup>4</sup>, Henderson Heather<sup>5</sup>, Nathan Fox<sup>1</sup>; <sup>1</sup>University of Maryland, College Park, <sup>2</sup>National Institute on Alcohol Abuse and Alcoholism, <sup>3</sup>National

Institute of Health, <sup>4</sup>University of Massachusetts, Amherst, <sup>5</sup>University of Waterloo

Topic Area: EXECUTIVE PROCESSES: Development & aging

**Poster F28 Managing two languages relates to managing two goals: fMRI evidence from task-switching**

Kelly A. Vaughn<sup>1</sup>, Arturo E. Hernandez<sup>1</sup>; <sup>1</sup>University of Houston

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster F29 Fast synchronization and slow synaptic learning as a solution to the stability-plasticity dilemma**

Pieter Verbeke<sup>1</sup>, Tom Verguts<sup>1</sup>; <sup>1</sup>Ghent University

Topic Area: EXECUTIVE PROCESSES: Goal maintenance & switching

**Poster F31 Influence of motivational incentives on conflict resolution: new evidence from Alzheimer's disease patients**

Elisa Di Rosa<sup>1</sup>, Nicky M.J. Edelstyn<sup>2</sup>, Daniela Mapelli<sup>1</sup>; <sup>1</sup>Department of General Psychology, University of Padova, Italy, <sup>2</sup>School of Psychology, Keele University, Staffordshire, UK

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster F32 The Negative Association of Underweight to Academic Performance and Cognitive Control in Undergraduate Women**

Keita Kamijo<sup>1</sup>, Toru Ishihara<sup>2</sup>, Suguru Torii<sup>1</sup>, Charles H. Hillman<sup>3</sup>; <sup>1</sup>Waseda University, <sup>2</sup>Tamagawa University Brain Science Institute, <sup>3</sup>Northeastern University

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster F33 Effects of cognitive engagements after acute exercise on inhibitory control**

Keishi Soga<sup>1</sup>, Tobias Vogt<sup>2</sup>, Hiroaki Masaki<sup>1</sup>; <sup>1</sup>Waseda University, <sup>2</sup>German Sport University Cologne

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster F34 The Effects of Vascular Risk Factors on Inhibitory Control in Cognitively Healthy Young Adults**

Juliette Seremak<sup>1</sup>, Heather Nall<sup>1</sup>, Alexandra Roach<sup>1</sup>; <sup>1</sup>University of South Carolina Aiken

Topic Area: EXECUTIVE PROCESSES: Monitoring & inhibitory control

**Poster F35 Functional Brain Alterations Associated with Cognitive Control in Blast-Related Mild Traumatic Brain Injury**

Danielle R. Sullivan<sup>1,2</sup>, Jasmeet Hayes<sup>1,2</sup>, Ginette Lafleche<sup>1,2</sup>, David Salat<sup>2,3,4</sup>, Mieke Verfaellie<sup>1,2</sup>; <sup>1</sup>Boston University School of Medicine, <sup>2</sup>VA Boston Healthcare System, <sup>3</sup>Massachusetts General Hospital, <sup>4</sup>Harvard University

Topic Area: EXECUTIVE PROCESSES: Other

**Poster F37 Neural Mechanisms of Perceptual Comparison Process for Detecting Feature-Binding Changes**

Bo-Cheng Kuo<sup>1</sup>; <sup>1</sup>National Taiwan University

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster F38 Neural Mechanisms Underlying Cognitive Control over Attentional Capture by Working Memory Content**

Peter S. Whitehead<sup>1</sup>, Mathilde M. Ooi<sup>1</sup>, Tobias Egner<sup>1</sup>, Marty G. Woldorff<sup>1</sup>; <sup>1</sup>Duke University

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster F39 Shifting auditory attention in perceptual and mnemonic space: an investigation of event-related EEG parameters in a sound localization and sound detection paradigm**

Laura-Isabelle Klatt<sup>1</sup>, Stephan Getzmann<sup>1</sup>, Daniel Schneider<sup>1</sup>; <sup>1</sup>Leibniz Research Centre for Working Environment and Human Factors, TU Dortmund

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster F40 Visual memories bypass normalization**

Yurika Watanabe<sup>1,2</sup>, Ilona M Bloem<sup>1,2</sup>, Melissa Kibbe<sup>1,2</sup>, Sam Ling<sup>1,2,3</sup>; <sup>1</sup>Boston University, <sup>2</sup>Center for Systems Neuroscience, Boston University, <sup>3</sup>Donders Institute for Brain, Cognition and Behavior, Radboud University

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster F41 Can TMS to Visual Cortex Reactivate Activity-Silent Representations in Visual Working Memory?**

Morgan Widhalm<sup>1</sup>, Nathan Rose<sup>1</sup>; <sup>1</sup>University of Notre Dame

Topic Area: EXECUTIVE PROCESSES: Working memory

**Poster F42 The relationship between lexical development and neural measures of speech discrimination in monolingual and bilingual children: Longitudinal evidence**

YAN H. YU<sup>1</sup>, Valerie L. Shafer<sup>2</sup>, Carol Tessel<sup>3</sup>, Michelle MacRoy-Higgins<sup>4</sup>, Nancy Vidal<sup>5</sup>, Alahna Cogburn<sup>2</sup>, Richard Schwartz<sup>2</sup>; <sup>1</sup>St. John's University, <sup>2</sup>The Graduate Center, City University of New York, <sup>3</sup>Florida Atlantic University, <sup>4</sup>Hunter College, City University of New York, <sup>5</sup>Iona College

Topic Area: LANGUAGE: Development & aging

**Poster F43 The development of print sensitivity in the visual word form system in pre-readers is influenced by orthographic experience and familial risk of dyslexia**

Jade Dunstan<sup>1</sup>, Xi Yu<sup>1</sup>, Jennifer Zuk<sup>1,2</sup>, Clarisa Carruthers<sup>1</sup>, Joseph Sanfilippo<sup>1</sup>, Ellen Grant<sup>1,2</sup>, Nadine Gaab<sup>1,2,3</sup>; <sup>1</sup>Boston Children's Hospital, <sup>2</sup>Harvard Medical School, <sup>3</sup>Harvard Graduate School of Education

Topic Area: LANGUAGE: Development & aging

**Poster F44 Linking Auditory Processing and Lexical Representation via Phonological Discrimination**

Vivi Tecoulesco<sup>1</sup>, Erika Skoe<sup>1</sup>, Letitia Naigles<sup>1</sup>; <sup>1</sup>University of Connecticut

Topic Area: LANGUAGE: Lexicon

**Poster F45 Spoken Language Processing in Cochlear Implant Users Under Perceptually Challenging Conditions: Fluent-Automatic Versus Slow-Effortful Neurocognitive Processing**

Gretchen N.L. Smith<sup>1</sup>, William G. Kronenberger<sup>1</sup>, David B. Pisoni<sup>2</sup>; <sup>1</sup>Indiana University School of Medicine, <sup>2</sup>Indiana University

Topic Area: LANGUAGE: Other

**Poster F46 The left-lateralized N170 and the phonological mapping hypothesis when learning to read in the adulthood**

Laura V. Sánchez-Vincitore<sup>1</sup>, Jon Andoni Duñabeitia<sup>2</sup>; <sup>1</sup>Universidad Iberoamericana (UNIBE), Dominican Republic, <sup>2</sup>Basque Center on Cognition, Brain and Language (BCBL), Spain



Topic Area: LANGUAGE: Other

**Poster F47 The Neurophysiology of Visual Rhyme in Deaf Undergraduate Readers**

Kali Cika<sup>1</sup>, Daniel Koo<sup>1</sup>, Lawrence Pick<sup>1</sup>, Veronica Cristiano<sup>1</sup>, Karen Garrido-Nag<sup>1</sup>; <sup>1</sup>Gallaudet University

Topic Area: LANGUAGE: Other

**Poster F48 Sensory simulation, motor simulation and mentalizing during narrative reading: Insights from eye-tracking**

Marloes Mak<sup>1</sup>, Roel M. Willems<sup>1,2</sup>; <sup>1</sup>Radboud University, Nijmegen, the Netherlands, <sup>2</sup>Max Planck Institute for Psycholinguistics, Nijmegen, the Netherlands

Topic Area: LANGUAGE: Other

**Poster F49 ERP Evidence for Probabilistic Lexical Prediction**

Emily Morgan<sup>1,2</sup>, Nate Delaney-Busch<sup>1</sup>, Minjae Kim<sup>3</sup>, Lena Warnke<sup>1</sup>, Eddie Wlotko<sup>4</sup>, Gina Kuperberg<sup>1,5</sup>; <sup>1</sup>Tufts University, <sup>2</sup>UC Davis, <sup>3</sup>Boston College, <sup>4</sup>Moss Rehab Center, <sup>5</sup>Massachusetts General Hospital

Topic Area: LANGUAGE: Other

**Poster F50 ERP exploration of semantic organization for abstract and concrete words in bilinguals and persons with aphasia**

Erika Exton<sup>1</sup>, Chaleece Sandberg<sup>1</sup>; <sup>1</sup>Penn State University

Topic Area: LANGUAGE: Semantic

**Poster F51 Relational versus Plural Concepts: The Role of the Left Angular Gyrus**

Adina Williams<sup>1</sup>, Liina Pyykkänen<sup>1,2</sup>; <sup>1</sup>New York University, New York, <sup>2</sup>New York University, Abu Dhabi

Topic Area: LANGUAGE: Semantic

**Poster F52 An MEG study of lexico-semantic processing in sentence comprehension: A Representational Similarity Analysis**

Lin Wang<sup>1,2</sup>, Ole Jensen<sup>3</sup>, Gina Kuperberg<sup>1,2</sup>; <sup>1</sup>Department of Psychiatry and the Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Harvard Medical School, Charlestown, MA, USA, <sup>2</sup>Department of Psychology, Tufts University, Medford, MA, USA, <sup>3</sup>Centre for Human Brain Health, University of Birmingham, Birmingham, UK

Topic Area: LANGUAGE: Semantic

**Poster F53 Semantic Priming of Reading by Visual Processing Stream: Exploring Encoding Through Stimulus Quality.**

Josh Neudorf<sup>1</sup>, Chelsea Ekstrand<sup>1</sup>, Shaylyn Kress<sup>1</sup>, Alexandra Neufeldt<sup>1</sup>, Ron Borowsky<sup>1</sup>; <sup>1</sup>University of Saskatchewan

Topic Area: LANGUAGE: Semantic

**Poster F54 Baseline semantic processing skills are important for typicality-based naming therapy outcomes**

Natalie Gilmore<sup>1</sup>, Erin Meier<sup>1</sup>, Jeffrey P. Johnson<sup>1</sup>, Swathi Kiran<sup>1</sup>; <sup>1</sup>Boston University

Topic Area: LANGUAGE: Semantic

**Poster F55 Cortical tracking of linguistic phrases: bottom-up and top-down effects of prosodic processing**

Anastasia Glushko<sup>1,2</sup>, Max Wolpert<sup>1,2</sup>, Alessandro Tavano<sup>3</sup>, David Poeppel<sup>3</sup>, Karsten Steinhauer<sup>1,2</sup>; <sup>1</sup>McGill University, <sup>2</sup>The Centre for Research on Brain, Language and Music, <sup>3</sup>Max Planck Institute for Empirical Aesthetics

Topic Area: LANGUAGE: Syntax

**Poster F56 Neurodevelopmental impact of early bilingual acquisition on children's syntactic processing.**

Neelima Wagley<sup>1</sup>, Xiaosu Hu<sup>1</sup>, Alisa Baron<sup>2</sup>, Akemi Tsutsumi Rioboo<sup>1</sup>, Isabel Hernandez<sup>1</sup>, James Booth<sup>3</sup>, Teresa Satterfield<sup>1</sup>, Lisa M. Bedore<sup>2</sup>, Ioulia Kovelman<sup>1</sup>; <sup>1</sup>University of Michigan, <sup>2</sup>University of Texas - Austin, <sup>3</sup>Vanderbilt University

Topic Area: LANGUAGE: Syntax

**Poster F57 Traumatic stress does not exert lesion-like effects on hippocampal function in children**

Jennifer Stevens<sup>1</sup>, Sanne van Rooij<sup>1</sup>, Ye Ji Kim<sup>1</sup>, Timothy Ely<sup>1</sup>, L. Alexander Vance<sup>1</sup>, Bekh Bradley<sup>1,2</sup>, Tanja Jovanovic<sup>1</sup>; <sup>1</sup>Emory University School of Medicine, <sup>2</sup>Atlanta Veterans' Affairs Medical Center

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster F58 Sensory dominance and multisensory integration as screening tools in aging**

Pawel J. Matusz<sup>1</sup>, Alison F. Eardley<sup>2</sup>, Trudi Edginton<sup>3</sup>, Rebecca Oyekan<sup>2</sup>, Emily Smyth<sup>2</sup>, Micah M. Murray<sup>1,4,5,6</sup>; <sup>1</sup>University Hospital Center - University of Lausanne, Switzerland, <sup>2</sup>University of Westminster, London, UK, <sup>3</sup>City, University of London, <sup>4</sup>Fondation Asile des Aveugles - University of Lausanne, Switzerland, <sup>5</sup>Center for Biomedical Imaging, Switzerland, <sup>6</sup>Vanderbilt University

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster F59 The Tell-Tale Heart: Infant memory for a stressful social event at 4-months.**

Isabelle Mueller<sup>1</sup>, Nancy Snidman<sup>1</sup>, Jennifer DiCorcia<sup>1</sup>, Akhila Sravish<sup>1</sup>, Erin Duffy<sup>1</sup>, Ed Tronick<sup>1</sup>; <sup>1</sup>University of Massachusetts Boston

Topic Area: LONG-TERM MEMORY: Development & aging

**Poster F60 Mesial temporal lobe epilepsy is characterized by hippocampal stiffness alterations and relational memory deficits**

Hillary Schwarb<sup>1</sup>, Curtis L. Johnson<sup>2</sup>, Bradley P Sutton<sup>1</sup>, Tracey M Wszalek<sup>1</sup>, Graham Huesmann<sup>3</sup>; <sup>1</sup>University of Illinois, <sup>2</sup>University of Delaware, <sup>3</sup>Carle Foundation Hospital

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F61 The sleep spindle refractory period segments memory reactivation events across time**

James Antony<sup>1</sup>, Luis Piloto<sup>1</sup>, Margaret Wang<sup>1</sup>, Paula Pacheco<sup>1</sup>, Kenneth Norman<sup>1</sup>, Ken Paller<sup>2</sup>; <sup>1</sup>Princeton University, <sup>2</sup>Northwestern University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F62 False memory for spatial location is mediated by V1**

Jessica M. Karanian<sup>1,2</sup>, Scott D. Slotnick<sup>3</sup>; <sup>1</sup>Wesleyan University, <sup>2</sup>Tufts University, <sup>3</sup>Boston College

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F63 Effects of emotional valence on retrieval-related recapitulation effects and subjective memory vividness**

Sarah Kark<sup>1</sup>, Ryan Daley<sup>1</sup>, Elizabeth Kensinger<sup>1</sup>; <sup>1</sup>Boston College

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F64 Thalamocortical spindles relate to changes in memory representations**

Emily Cowan<sup>1</sup>, Anli Liu<sup>2</sup>, Simon Henin<sup>2</sup>, Sanjeev Kothare<sup>2</sup>, Orrin Devinsky<sup>2</sup>, Lila Davachi<sup>1</sup>; <sup>1</sup>New York University, <sup>2</sup>NYU Langone School of Medicine

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F65 Sex differences in the brain during long-term item memory**

Dylan S. Spets<sup>1</sup>, Scott D. Slotnick<sup>1</sup>; <sup>1</sup>Boston College

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F66 Increased fMRI connectivity of the anterior-medial hippocampal-cortical network via noninvasive brain stimulation**

Molly S. Hermler<sup>1</sup>, Melissa Gunlogson<sup>1</sup>, Robert Palumbo<sup>1</sup>, Brennan Durr<sup>1</sup>, Valerie McDonald<sup>1</sup>, Stephen VanHaerants<sup>1</sup>, Joel L. Voss<sup>1</sup>; <sup>1</sup>Northwestern University Feinberg School of Medicine

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F67 Improving Episodic Autobiographical Memory in Older Adults with a Novel Digital Memory Augmentation Device**

Bryan Hong<sup>1</sup>, Chris B Martin<sup>1</sup>, Andrew Xia<sup>1</sup>, Chris J Honey<sup>1,2</sup>, Morgan D Barese<sup>1,3</sup>; <sup>1</sup>University of Toronto, <sup>2</sup>Johns Hopkins University, <sup>3</sup>Rotman Research Institute

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F68 Opposing mnemonic and decision-making biases in recognition memory judgments**

Azara Lalla<sup>1</sup>, Anuya Patil<sup>1</sup>, Jennifer D Ryan<sup>1,2,3</sup>, Katherine Duncan<sup>1</sup>; <sup>1</sup>Department of Psychology, University of Toronto, ON, Canada, <sup>2</sup>Rotman Research Institute, Baycrest, Toronto, ON, Canada, <sup>3</sup>Department of Psychiatry, University of Toronto, ON, Canada

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F69 The effects of selective retrieval and selective suppression on spatial memory**

Taylor R. Russo<sup>1</sup>, Jessica M. Karanian<sup>2</sup>, Brittany M. Jeye<sup>1</sup>, Scott D. Slotnick<sup>1</sup>; <sup>1</sup>Boston College, <sup>2</sup>Wesleyan University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F70 Tracking the impact of retrieval suppression on individual memory representations**

Ann-Kristin Meyer<sup>1,2</sup>, Roland G. Benoit<sup>1</sup>; <sup>1</sup>Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany, <sup>2</sup>International Max Planck Research School on Neuroscience of Communication

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F71 Boosting Face Memory With Targeted Memory Reactivation During Sleep**

Nathan Whitmore<sup>1</sup>, Adrianna M. Bassard<sup>1</sup>, Ken A. Paller<sup>1</sup>; <sup>1</sup>Northwestern University

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F72 Hippocampal sensitivity to event boundaries in encoding of naturalistic events**

Aya Ben-Yakov<sup>1</sup>, Rik Henson<sup>1</sup>; <sup>1</sup>University of Cambridge

Topic Area: LONG-TERM MEMORY: Episodic

**Poster F73 The Durability of Statistical Learning: Direct and Indirect Measures**

Helen Liu<sup>1</sup>, Katherine Duncan<sup>1</sup>, Amy S. Finn<sup>1</sup>; <sup>1</sup>University of Toronto

Topic Area: LONG-TERM MEMORY: Other

**Poster F74 Social value learning shifts conceptual representations of faces**

Ariana M. Familiar<sup>1</sup>, Sharon L. Thompson-Schill<sup>1</sup>; <sup>1</sup>University of Pennsylvania

Topic Area: LONG-TERM MEMORY: Semantic

**Poster F75 Dyslexia and Reading Ability Predict Sequence Learning Impairments**

Brianna Wenande<sup>1</sup>, Emily Een<sup>1</sup>, Mark A. Gluck<sup>2</sup>, Jessica R. Petok<sup>1</sup>; <sup>1</sup>St. Olaf College, <sup>2</sup>Rutgers University

Topic Area: LONG-TERM MEMORY: Skill learning

**Poster F76 Alpha phase modulates the amplitude and variance of suprathreshold TMS-induced motor evoked potentials**

Lukas Schilberg<sup>1,2</sup>, Sanne ten Oever<sup>1,2</sup>, Teresa Schuhmann<sup>1,2</sup>, Alexander T. Sack<sup>1,2</sup>; <sup>1</sup>Maastricht University, <sup>2</sup>Maastricht Brain Imaging Center

Topic Area: METHODS: Electrophysiology

**Poster F77 Comparing Functional and Structural Predictors of Cognition via Machine Learning**

G. Andrew James<sup>1</sup>, Ming-Hua Chung<sup>1</sup>, Keith A. Bush<sup>1</sup>, Clinton D. Kilts<sup>1</sup>;

<sup>1</sup>University of Arkansas for Medical Sciences

Topic Area: METHODS: Neuroimaging

**Poster F78 Streams of Thought: An ICA Methodology for Lagged Resting State Analysis**

Erik Jahner<sup>1,3</sup>, Xiao-Fei Yang<sup>2,3</sup>, Mary Helen Immordino-Yang<sup>2,3</sup>; <sup>1</sup>University of California Riverside, <sup>2</sup>University of Southern California, <sup>3</sup>Brain and Creativity Institute

Topic Area: METHODS: Neuroimaging

**Poster F79 Cognitive and sensorimotor aspects of handwriting in multiple sclerosis: an fMRI study**

Laura Bonzano<sup>1</sup>, Ambra Bisio<sup>1</sup>, Ludovico Pedullà<sup>1,2</sup>, Giampaolo Bricchetto<sup>2</sup>, Marco Bove<sup>1</sup>; <sup>1</sup>University of Genoa, Italy, <sup>2</sup>Italian Multiple Sclerosis Foundation, Genoa, Italy

Topic Area: METHODS: Neuroimaging

**Poster F80 Temporal variability of functional brain connectivity predicts individual differences in attention**

Angus Ho Ching Fong<sup>1</sup>, Kwangsun Yoo<sup>1</sup>, Monica D Rosenberg<sup>1</sup>, Marvin M Chun<sup>1</sup>; <sup>1</sup>Yale University

Topic Area: METHODS: Neuroimaging

**Poster F81 Optimizing fMRI experimental outcomes via neuroadaptive task designs**

Ming-Hua Chung<sup>1</sup>, Bradford Martins<sup>1</sup>, G. Andrew James<sup>1</sup>, Anthony Privratsky<sup>1</sup>, Clinton D. Kilts<sup>1</sup>, Keith A. Bush<sup>1</sup>; <sup>1</sup>University of Arkansas for Medical Sciences

Topic Area: METHODS: Neuroimaging

**Poster F82 Reverse Inference Problem with Task Difficulty and Reaction Times**

Alexander Gordon<sup>1</sup>, Mark Straccia<sup>1</sup>, Matthew Lieberman<sup>1</sup>; <sup>1</sup>University of California, Los Angeles

Topic Area: METHODS: Other

**Poster F83 Polygenic risk and trajectories of cognitive impairment in schizophrenia: associations limited to the “Cognitively Stable”**

Sofia Zaidman<sup>1</sup>, Evan Giangrande<sup>2</sup>, Daniel Weinberger<sup>3</sup>, Karen Berman<sup>1</sup>, Dwight Dickinson<sup>1</sup>; <sup>1</sup>Clinical and Translational Neuroscience Branch, IRP, NIMH, <sup>2</sup>University of Virginia, <sup>3</sup>Lieber Institute for Brain Development  
Topic Area: OTHER

**Poster F84 Contribution of the prefrontal and parietal regions to time estimation and temporal control: A study of patients with a brain tumor before and after surgery**

Yayoi Shigemune<sup>1,2</sup>, Shoko Saito<sup>2</sup>, Kentaro Hiromitsu<sup>1,2</sup>, Kanako Hamamoto<sup>3</sup>, Nobusada Shinoura<sup>4</sup>, Ryoji Yamada<sup>4</sup>, Akira Midorikawa<sup>1,2,3</sup>; <sup>1</sup>Graduate School of Letters, Chuo University, Tokyo, Japan, <sup>2</sup>Institute of Cultural Science, Chuo University, Tokyo, Japan, <sup>3</sup>Faculty of Letters, Chuo University, Tokyo, Japan, <sup>4</sup>Tokyo Metropolitan Cancer and Infectious Diseases Center Komagome Hospital, Tokyo, Japan  
Topic Area: OTHER

**Poster F85 The mediate effect of changes in resting-state functional connectivity on resilience due to short-term intensive meditation: a randomized controlled trial**

Seoyeon Kwak<sup>1</sup>, Tae Young Lee<sup>2</sup>, Wi Hoon Jung<sup>3</sup>, Ji-won Hur<sup>4</sup>, Dahye Bae<sup>1</sup>, Wu Jeong Hwang<sup>1</sup>, Kang Ik K. Cho<sup>2</sup>, Kyung-Ok Lim<sup>5</sup>, So-Yeon Kim<sup>6</sup>, Hye Yoon Park<sup>7</sup>, Jun Soo Kwon<sup>7</sup>; <sup>1</sup>Seoul National University, Republic of Korea, <sup>2</sup>SNU-MRC, Republic of Korea, <sup>3</sup>Korea University, Republic of Korea, <sup>4</sup>Chung-Ang University, Republic of Korea, <sup>5</sup>National Institute of Forensic Psychiatry, Ministry of Justice, Republic of Korea, <sup>6</sup>Duksung Women's University, Republic of Korea, <sup>7</sup>Seoul National University Hospital, Republic of Korea  
Topic Area: OTHER

**Poster F86 Dissociating the functions of delta and beta oscillatory entrainments: from intrapersonal and interpersonal perspectives**

Andrew Chang<sup>1</sup>, Dan Bosnyak<sup>1</sup>, Laurel Trainor<sup>1,2</sup>; <sup>1</sup>McMaster University, <sup>2</sup>Rotman Research Institute  
Topic Area: PERCEPTION & ACTION: Audition

**Poster F87 Hearing Creatively: Default Network Selectively Synchronizes to Auditory Cortex in Jazz Improvising Musicians**

Alexander Belden<sup>1</sup>, Tima Zeng<sup>1</sup>, Emily Przyssinda<sup>1</sup>, Psyche Loui<sup>1</sup>; <sup>1</sup>Wesleyan University  
Topic Area: PERCEPTION & ACTION: Audition

**Poster F88 Structural and Functional Correlates of Musical Anhedonia**

Sean Patterson<sup>1</sup>, Monday Zhou<sup>1</sup>, Psyche Loui<sup>1</sup>; <sup>1</sup>Wesleyan University  
Topic Area: PERCEPTION & ACTION: Audition

**Poster F89 Aging in the sensorimotor system: Lower GABA levels are associated with decreased network segregation and impaired behavior**

Kaitlin Cassady<sup>1</sup>, Holly Gagnon<sup>1</sup>, Poortata Lalwani<sup>1</sup>, Molly Simmonite<sup>1</sup>, Bradley Foerster<sup>2</sup>, Denise Park<sup>3</sup>, Myria Petrou<sup>2</sup>, Rachael D. Seidler<sup>1,4,5</sup>, Stephan Taylor<sup>1,6</sup>, Daniel H. Weissman<sup>1</sup>, Thad A. Polk<sup>1</sup>; <sup>1</sup>Department of Psychology, University of Michigan, Ann Arbor, MI, USA, <sup>2</sup>Department of Radiology, University of Michigan, Ann Arbor, MI, USA, <sup>3</sup>Research of the Center for Vital Longevity, University of Texas at Dallas, Dallas, TX, USA, <sup>4</sup>School of Kinesiology, University of Michigan, Ann Arbor, MI, USA,

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Topic Area: PERCEPTION & ACTION: Development & aging

**Poster F90 Rhythm-based temporal prediction in children with Autism Spectrum Disorder (ASD)**

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Topic Area: PERCEPTION & ACTION: Development & aging

**Poster F91 Training the human mirror neuron system: An EEG study**

Victoria Brunson<sup>1</sup>, Elisabeth Bradford<sup>1</sup>, Laura Smith<sup>1</sup>, Heather Ferguson<sup>1</sup>; <sup>1</sup>University of Kent  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster F92 Asymmetric Interference Between Cognitive Task Components and Concurrent Sensorimotor Coordination**

Joshua Baker<sup>1</sup>, Antonio Castro<sup>1</sup>, Andrew K Dunn<sup>1</sup>, Suvobrata Mitra<sup>1</sup>; <sup>1</sup>Nottingham Trent University  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster F93 Sleep Quality's Effect on EEG Activity Underlying Information Processing during Motor Control**

Katherine A. Hyson<sup>1</sup>, Robert S. Ross<sup>1</sup>, Wayne J. Smith<sup>1</sup>, Ronald V. Croce<sup>1</sup>; <sup>1</sup>University of New Hampshire  
Topic Area: PERCEPTION & ACTION: Motor control

**Poster F94 Deficit of Prediction Ability as A Potential Cause of Phantom Noise in Autism Spectrum Disorder**

Jyh-Jong Hsieh<sup>1</sup>, Yukie Nagai<sup>2</sup>, Minoru Asada<sup>1</sup>; <sup>1</sup>Osaka University, <sup>2</sup>National Institute of Information and Communications Technology  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster F95 Full-body ownership illusion elicited by visuo-vestibular integration**

Nora Preuss<sup>1</sup>, Henrik Ehrsson<sup>1</sup>; <sup>1</sup>Karolinska Institutet  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster F96 Atypical multisensory temporal integration in posterior superior temporal cortex may underlie language, social, and perceptual deficits in autism spectrum disorders**

Naail A. Khan<sup>1</sup>, Stephanie M. Lavoie<sup>1</sup>, Ryan A. Stevenson<sup>2</sup>, Morgan D. Barense<sup>3</sup>, Mark T. Wallace<sup>4</sup>, James M. Bebko<sup>1</sup>, W. Dale Stevens<sup>1</sup>; <sup>1</sup>York University, Toronto, <sup>2</sup>University of Western Ontario, <sup>3</sup>University of Toronto, <sup>4</sup>Vanderbilt University  
Topic Area: PERCEPTION & ACTION: Multisensory

**Poster F97 Deaf signers' sensorimotor system activity during perception of one and two handed signs**

Emily Kubicek<sup>1</sup>, Lorna C. Quandt<sup>1</sup>; <sup>1</sup>Gallaudet University  
Topic Area: PERCEPTION & ACTION: Other

**Poster F98 Atypical lateralization of intrinsic functional connectivity underlies aberrant face processing in autism spectrum disorders**

Lily M. Solomon-Harris<sup>1</sup>, Naail A. Khan<sup>1</sup>, Vladyslava Replete<sup>1</sup>, Cynthia S. Peng<sup>2</sup>, W. Dale Stevens<sup>1</sup>, Alex Martin<sup>2</sup>; <sup>1</sup>York University, Toronto, <sup>2</sup>National Institute of Mental Health, National Institutes of Health

Topic Area: PERCEPTION & ACTION: Vision

**Poster F99 Stimulus Integrity Modulates the Effect of Context on Object Recognition**

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Topic Area: PERCEPTION & ACTION: Vision

**Poster F100 Color categorization without color naming: neuropsychological evidence**

Katarzyna Siuda-Krzywicka<sup>1</sup>, Christoph Witzel<sup>2</sup>, Emma Chabani<sup>1</sup>, Myriam Taga<sup>3</sup>, Laurent Cohen<sup>1,4</sup>, Paolo Bartolomeo<sup>1</sup>; <sup>1</sup>Inserm U 1127, CNRS UMR 7225, Sorbonne Universités, UPMC Univ Paris 06 UMR S 1127, Institut du Cerveau et de la Moelle épinière, ICM, Hôpital de la Pitié-Salpêtrière, Paris, France, <sup>2</sup>Justus-Liebig-Universität Gießen, <sup>3</sup>University of East London, <sup>4</sup>Hôpital de la Pitié Salpêtrière Paris, France

Topic Area: PERCEPTION & ACTION: Vision

**Poster F101 Correlation of memory regions with face and object regions differentially predict performance on face/object memory tasks**

Michal Ramot<sup>1</sup>, Catherine Walsh<sup>1</sup>, Alex Martin<sup>1</sup>; <sup>1</sup>National Institute of Mental Health, National Institutes of Health

Topic Area: PERCEPTION & ACTION: Vision

**Poster F102 Predicting Automation Aid Response Time from EEG versus Low Cost Wearable Devices**

Dean Cisler<sup>1</sup>, Carryl Baldwin<sup>1</sup>, Pamela Greenwood<sup>1</sup>, Ryan McKendrick<sup>2</sup>; <sup>1</sup>George Mason University, <sup>2</sup>Northrop Grumman

Topic Area: PERCEPTION & ACTION: Vision

**Poster F103 Prefrontal Cortex Supports the Transfer of Hierarchical Task Structure to Novel Environments**

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Topic Area: THINKING: Decision making

**Poster F104 The Effects of rTMS on Criterion Shifting during Memory Recognition**

Evan Layher<sup>1</sup>, Lukas Volz<sup>1</sup>, Tyler Santander<sup>1</sup>, Michael Miller<sup>1</sup>; <sup>1</sup>University of California Santa Barbara

Topic Area: THINKING: Decision making

**Poster F105 Why did Pandora open the box? When curiosity overrides prospective risk**

Johnny King Lau<sup>1</sup>, Hiroki Ozono<sup>2</sup>, Anthony Haffey<sup>1</sup>, Kei Kuratomi<sup>3</sup>, Asuka Komiya<sup>4</sup>, Kou Murayama<sup>1</sup>; <sup>1</sup>The Centre for Integrative Neuroscience and Neurodynamics, University of Reading, UK, <sup>2</sup>Kagoshima University, Japan, <sup>3</sup>Kochi University of Technology, Japan, <sup>4</sup>Hiroshima University, Japan

Topic Area: THINKING: Decision making

**Poster F106 The influence of expected reward and efficacy on cognitive effort allocation**

Carolyn K. Dean Wolf<sup>1</sup>, Elizabeth V. Cory<sup>1</sup>, Amitai Shenhav<sup>1</sup>; <sup>1</sup>Brown University

Topic Area: THINKING: Decision making

**Poster F107 Children Engage Semantic Processes to Verify Arithmetic Facts: Evidence from the N400**

Amandine E. Grenier<sup>1</sup>, Vanessa Cerda<sup>1</sup>, Danielle S. Dickson<sup>1</sup>, Bianca O. Obinyan<sup>1</sup>, Jacob P. Momsen<sup>2,3</sup>, Nicole Y.Y. Wicha<sup>1</sup>; <sup>1</sup>The University of Texas at San Antonio, <sup>2</sup>University of California San Diego, <sup>3</sup>San Diego State University

Topic Area: THINKING: Development & aging

**Poster F108 Network Topology of Symbolic and Nonsymbolic Number Processing: A 7T fMRI Study**

Benjamin N. Conrad<sup>1</sup>, Eric D. Wilkey<sup>1</sup>, Gavin R. Price<sup>1</sup>; <sup>1</sup>Peabody College, Vanderbilt University

Topic Area: THINKING: Other

**Poster F109 High and low-frequency activity in intracranial electroencephalography reflect the difficulty of mental arithmetic operations**

Michael J. Randazzo<sup>1</sup>, Youssef Ezzyat<sup>1</sup>, Michael J. Kahana<sup>1</sup>; <sup>1</sup>University of Pennsylvania

Topic Area: THINKING: Problem solving

**Poster F110 A right-hemispheric advantage for fast inferential reasoning**

Maria Eckstein<sup>1</sup>, Silvia A. Bunge<sup>1</sup>; <sup>1</sup>University of California, Berkeley

Topic Area: THINKING: Reasoning

**Poster F111 Associations between cortical thickness and reasoning vary by socioeconomic status in early childhood**

Julia A. Leonard<sup>1</sup>, Rachel R. Romeo<sup>1</sup>, Anne T. Park<sup>2</sup>, Megumi Takada<sup>1</sup>, Sydney T. Robinson<sup>2</sup>, John D.E. Gabrieli<sup>1</sup>, Allyson P. Mackey<sup>2</sup>;

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Topic Area: THINKING: Reasoning

**Poster F112 Timing the automatic activation and the early and late inhibition of the actions associated to a real object with event-related brain potentials**

J. Bruno Debruille<sup>1</sup>, Molly Touzel<sup>2</sup>, Christine Snidal<sup>3</sup>, Julia Segal<sup>4</sup>; <sup>1</sup>Dpt of Psychiatry, McGill University, <sup>2</sup>Dpt of Neuroscience, McGill University, <sup>3</sup>Dpt of Neuroscience, McGill University, <sup>4</sup>Dpt of Neuroscience, McGill University

Topic Area: PERCEPTION & ACTION: Motor control

**Poster F113 Neuroimaging of Functional Movement Disorders Before and After Treatment**

Leonard Faul<sup>1</sup>, Brendan Depue<sup>2</sup>, Alexandra Jacob<sup>2</sup>, Darryl Kaelin<sup>2</sup>, Alberto Espay<sup>3</sup>, Kathrin LaFaver<sup>2</sup>; <sup>1</sup>Duke University, <sup>2</sup>University of Louisville, <sup>3</sup>University of Cincinnati

Topic Area: PERCEPTION & ACTION: Motor control

**Poster F114 Learning to control unstable dynamics via movement sonification improves generalization**

Dobromir Dotov<sup>1</sup>; <sup>1</sup>McMaster University

Topic Area: PERCEPTION & ACTION: Motor control

**Poster F115 Making plans in wonderland: Sensorimotor alterations increase temporal similarity of motor planning and imagery**

Rotem Bennet<sup>1</sup>, Miriam Reiner<sup>1</sup>; <sup>1</sup>Technion

Topic Area: PERCEPTION & ACTION: Motor control

**Poster F116 Timbre Impacts the Consistency of Music-Color Synesthesia**

Radhika S. Gosavi<sup>1</sup>, Rory Bade<sup>1</sup>, Edward M. Hubbard<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

Topic Area: PERCEPTION & ACTION: Multisensory

**Poster F117 Getting ready for Mars: how the brain perceives new gravitational environments**

Maria Gallagher<sup>1</sup>, Agoston Torok<sup>2</sup>, Camille Lasbareilles<sup>1</sup>, Elisa Raffaella Ferrè<sup>1</sup>; <sup>1</sup>Royal Holloway, University of London, <sup>2</sup>Hungarian Academy of Sciences

Topic Area: PERCEPTION & ACTION: Multisensory

**Poster F118 The relation between affective touch and pupil size**

Chris Dijkerman<sup>1</sup>, Roel van Hooijdonk<sup>1</sup>, Sebastiaan Mathot<sup>2</sup>, Evelien Schat<sup>1</sup>, Hannah Spencer<sup>1</sup>, Stefan van der Stigchel<sup>1</sup>; <sup>1</sup>Utrecht University, The Netherlands, <sup>2</sup>University of Groningen, the Netherlands

Topic Area: PERCEPTION & ACTION: Multisensory

**Poster F119 Functional Specificity and Sex Differences in the Neural Circuits Supporting the Inhibition of Automatic Imitation**

Kohinoor M. Darda<sup>1</sup>, Emily E. Butler<sup>1</sup>, Richard Ramsey<sup>1</sup>; <sup>1</sup>Bangor University

Topic Area: PERCEPTION & ACTION: Other

**Poster F120 Frequency modulation of neural oscillations according to visual task demands**

Jason Samaha<sup>1</sup>, Andreas Wutz<sup>2,3</sup>, Bradley Postle<sup>1</sup>, David Melcher<sup>2</sup>; <sup>1</sup>University of Wisconsin-Madison, <sup>2</sup>University of Trento, <sup>3</sup>Massachusetts Institute of Technology

Topic Area: PERCEPTION & ACTION: Vision

**Poster F121 Serial dependence in numerosity perception.**

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Topic Area: PERCEPTION & ACTION: Vision

**Poster F122 Impact of Working Memory Load and Stimulus Movement on Non-symbolic Number Perception**

Justin Bonny<sup>1</sup>; <sup>1</sup>Morgan State University

Topic Area: PERCEPTION & ACTION: Vision

**Poster F123 The Psychophysics of Make-up Changes in Female Faces**

Gregor Hayn-Leichsenring<sup>1</sup>, Anjan Chatterjee<sup>1</sup>; <sup>1</sup>University of Pennsylvania

Topic Area: PERCEPTION & ACTION: Vision

**Poster F124 Effects of directed attention on stimulus attribute weighting: An ERP study**

Alison Harris<sup>1</sup>, Aleena Young<sup>1</sup>; <sup>1</sup>Claremont McKenna College

Topic Area: THINKING: Decision making

**Poster F125 Perceptual decision making is supported by a hierarchical processing cascade, in both biological and artificial neural networks**

Laura Gwilliams<sup>1,2</sup>, Jean-Rémi King<sup>3,1</sup>; <sup>1</sup>New York University, <sup>2</sup>NYU Abu Dhabi, <sup>3</sup>Frankfurt Institute for Advanced Studies

Topic Area: THINKING: Decision making

**Poster F126 The influence of negotiation style during online negotiations: an event-related potential (ERP) study**

Suzana de França Dantas Daher<sup>1,2</sup>, Jádilson Alves de Moura<sup>1,2</sup>;

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Topic Area: THINKING: Decision making

**Poster F127 Neural Correlates of Encoding and Retrieving Probabilities of Event Occurrences.**

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Topic Area: THINKING: Decision making

**Poster F128 Distribution of Relative Quantities in Nature and Human Culture**

Santiago Alonso-Díaz<sup>1</sup>, Luis Alejandro Lee-Penagos<sup>1</sup>, Gabriel Ignacio Penagos-Londoño<sup>1</sup>; <sup>1</sup>Department of Economics, Universidad Javeriana, Bogotá Colombia

Topic Area: THINKING: Decision making

**Poster F129 FEEDBACK PROCESSING AND RISK TAKING IN HIGH-ACHIEVING ADOLESCENTS**

Kayla Talbot<sup>1</sup>, Taylor Valentin<sup>1</sup>, Max Lobel<sup>1</sup>, Danielle diFilipo<sup>1,2</sup>, Jill Grose-Fifer<sup>1,2</sup>; <sup>1</sup>John Jay College of Criminal Justice, CUNY, <sup>2</sup>The Graduate Center, CUNY

Topic Area: THINKING: Development & aging

**Poster F130 An event-related potential study of number format and the problem-size effect in arithmetic**

Danielle S. Dickson<sup>1</sup>, Bianca O. Obinyan<sup>1</sup>, Nicole Y. Y. Wicha<sup>1</sup>; <sup>1</sup>University of Texas at San Antonio

Topic Area: THINKING: Problem solving

**Poster F131 Individual differences in information processing predict distinct structural connectivity patterns**

Justin C. Hayes<sup>1</sup>, Katherine L. Alfred<sup>1</sup>, David J. M. Kraemer<sup>1</sup>; <sup>1</sup>Dartmouth College

Topic Area: THINKING: Problem solving

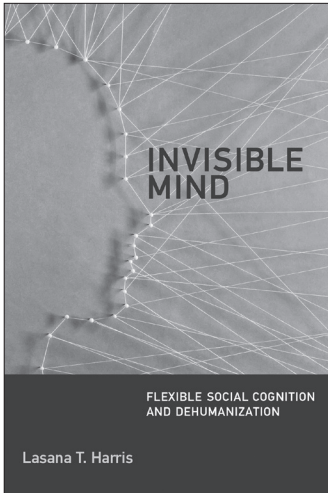
**Poster F132 No gender differences in neural processing of mathematics in early childhood**

Alyssa J. Kersey<sup>1</sup>, Kelsey D. Csumitta<sup>1</sup>, Jessica F. Cantlon<sup>1</sup>; <sup>1</sup>University of Rochester

Topic Area: THINKING: Reasoning

**Poster F133 Neural Activity While Listening to Sentences Predicts University STEM Educational Outcomes**

Richard J. Daker<sup>1</sup>, H. Moriah Sokolowski<sup>2</sup>, Ian M. Lyons<sup>1</sup>; <sup>1</sup>Georgetown University, Department of Psychology, <sup>2</sup>University of Western Ontario, Brain and Mind Institute



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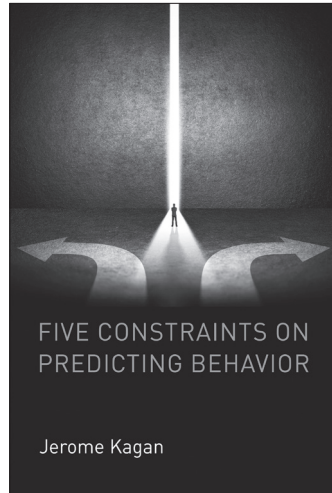
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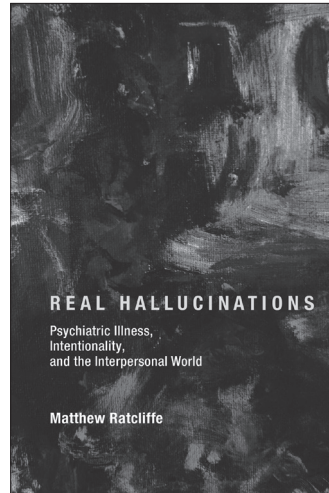
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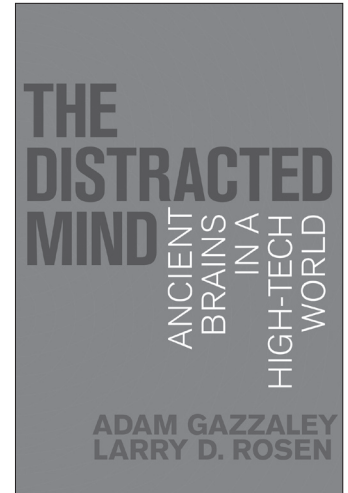
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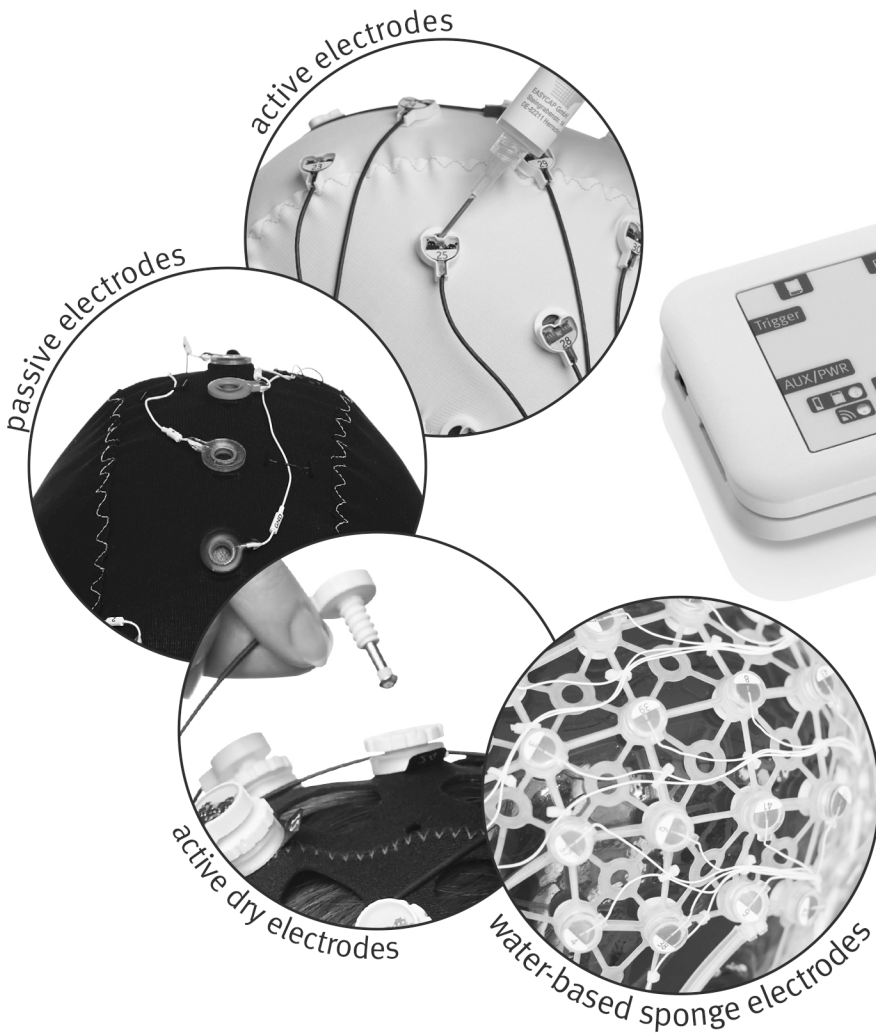
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