34th Banff Annual Seminar In Cognitive Science

Friday May 1

5:00 pm Welcome and opening remarks

Please register with Peter Dixon if you have not already done so ($70 for faculty, $25 for students and postdoctoral fellows).

5:15 pm **David Balota** (Washington University in St. Louis), *Attentional Control and Biomarkers in Healthy Aging and Early Stage Alzheimer's Disease*

Research examining changes in attentional control systems will be examined as a behavioural marker for early stage Alzheimer's Disease (AD) and a potential predictor of later conversion to AD in cognitively normal individuals. Discussion will focus on the consequences of breakdowns in attentional control on memory performance, variability, and characteristics of reaction time distributions. Emphasis will be placed on recent work relating biomarkers (e.g., resting state fMRI connectivity and cerebral spinal fluid estimates of Aβ42 and tau) to changes in these control systems in non-demented individuals at risk for developing AD.

6:45 pm Dinner break

8:00 pm Reception and poster session

10:00 pm Adjourn

Saturday May 2

8:30 am Coffee, tea, juice, pastries

9:00 am **Barry Giesbrecht** (University of California Santa Barbara), *Context, Reward, and the Biasing of Visual Attention*

The human attention system helps us cope with a complex environment by supporting the selective processing of information relevant to our current goals. The efficiency of the human attention system is heavily influenced by environmental regularities that can effectively reduce uncertainty and complexity. I will present a series of behavioural, electrophysiological, and fMRI studies designed to investigate the interaction between systems that support the learning of environmental regularities and those that mediate visual attention. I will focus on two types of learned regularities: Spatial configurations that predict object locations and nonspatial reward contingencies. While the learning of these regularities is mediated by very different neural structures, I will show that they have similar influences on the visual attention system. When these findings are considered together with previous behavioural, patient, and neuroimaging studies, along with studies demonstrating both anatomical and functional links between parietal cortex, the medial temporal lobe, and the basal ganglia, the empirical evidence converges on the notion that the attention system is guided by multiple representations and this guidance supports coherent behaviour in a complex environment.

10:30 am Coffee, tea, juice

11:00 am **James Danckert** (University of Waterloo), *Mental Models in the Brain: Representing Salience and Surprise*

We are incapable of accurately representing all sensory elements of our noisy and chaotic environment. To deal with these challenges, humans make use of mental models to represent the key components of the environment as accurately as possible. To be effective, mental models need at least two key components: First, they must accurately capture regularities and contingencies in the environment – that is, they have to determine, what is salient? Second, they need to be vigilant to change – determining when new information fails to conform to predictions generated by the model – when is current evidence is surprising relative to the model's predictions? I will present evidence to suggest that the ability to accurately represent environmental regularities and to update those representations in the face of change is supported by a predominantly right hemisphere network of brain regions including the anterior insular, medial frontal cortex, and the inferior parietal lobule. Using a range of statistical learning paradigms, I will demonstrate that right brain damage (RBD) patients fail to accurately represent regularities and, moreover, fail to adapt to changes in regularities. I will claim that such mental model updating deficits in RBD patients are generic. In two fMRI studies, we showed that updating a model of an opponent's bias in "rock, paper, scissors" or changing a perceptual report of an ambiguous figure activated a highly similar network of brain regions including the anterior insular, medial frontal cortex, and inferior parietal lobule. We hypothesize specific roles for these regions such that the insular maintains the current model, the medial frontal cortex determines when to explore options/hypotheses to developing a new model, and the inferior parietal cortex represents salience and surprise. One challenge in evaluating mental models lies in determining what model a participant has before coming into the lab. I will report data from a novel task (Plinko) we developed that allows us to flexibly assess a participant's prior expectations, as well as determining their efficiency in building and updating mental models. Pilot data from RBD patients on this task confirms that they are impaired in both processes. This body of work represents a novel conceptualization of right hemisphere brain function for which there is growing supporting evidence.

12:30 pm Lunch break

2:00 pm **James Moore** (Goldsmiths University of London), *Was that Me? Exploring the Sense of Agency in Health and Disease*

"Sense of agency" refers to the experience of initiating and controlling our actions in order to influence events in the outside world. I will first establish the theoretical framework by discussing work in healthy adults showing that various agency cues contribute to the sense of agency. I will then explore how this theoretical framework can help us understand agency processing abnormalities in certain psychiatric (e.g., schizophrenia) and neurological (e.g., corticobasal degeneration) disorders.

3:30 pm Coffee, tea, juice, cake

4:00 PM **Ellen R. A. de Bruijn** (Leiden University), *Mistakes that Matter: A Social Neuropsychiatric Perspective on Performance Monitoring*

In order to perform in a safe, efficient, and socially adequate manner, humans need to continuously monitor own and other's behaviour for errors and possible deviations from the goal. This so-called performance monitoring importantly enables flexible adaptive behaviour, and the relevance of this central process becomes evident when disturbances arise, as is the case in many psychiatric disorders. Research has identified the cognitive and neural mechanisms involved in performance monitoring in non-social contexts, but social performance monitoring has only recently begun to receive attention.

In the first part of my presentation, I will give an overview of performance-monitoring research and theories in individual contexts and possible modulations of these processes in psychiatric disorders and following psychopharmacological manipulations. I will specifically focus on an event-related potential related to error detection, the error-related negativity or ERN. In the second part, I will focus on the relevance of employing a social perspective on performance monitoring and will present recent EEG and fMRI findings from our own and other labs. I will end my presentation with a combined perspective and present some recent results of our work on altered social performance monitoring processes in psychopathy and after administration of oxytocin in healthy volunteers.

5:30 pm Closing remarks

6:00 pm Reception and poster session

8:00 pm Adjourn

Friday Posters

1 Alex Porthukaran, Amanda Fitzner, Ty McKinney, Chris Westbury (University of Alberta), *The implicit scale of emotional reactivity: Physiological, convergent, and divergent validity of a new instrument for measuring affect*

2 Austen Smith, Lorin J. Elias (University of Saskatchewan), *Visual explorations and preferences of laterally lit images by left-to-right and right-to-left readers*

3 Emma Blakey, Daniel J. Carroll (The University of Sheffield), *Preschoolers' working memory improves following brief executive function training*

4 Rodney Schmaltz, Christa Engel, Erik Jansen (MacEwan University), *"Of course I know what science is!": Correlates of pseudoscientific belief and scientific thinking in undergraduate students*

5 Ciro Civile, Sukhvinder Obhi (McMaster University), *The social-cognitive effects of power*

6 Alexander G. Kenny, Glen E. Bodner (University of Calgary), *Production enhances conscious and automatic influences of memory*

7 Nathan D. Rider, Glen E. Bodner (University of Calgary), *Does taking a walk in nature enhance memory for word lists?*

8 P. Ian Newcombe, Tamara Kumpan, Brian Duffels, Paul D. Siakaluk (University of Northern British Columbia), Penny Pexman (University of Calgary), *The effects of emotional experience in conceptual processing*

9 Tyler Roberts, Patti-Anne LeClerc, Chris Striemer, Michelle Jarick (MacEwan University), *Covert face recognition in an individual with congenital prosopagnosia*

10 Alan Nielsen, Simon Kirby, Kenny Smith (University of Edinburgh), Julia Simner (University of Sussex), *Motivated vs. conventional systematicity: Implications for language learning and the structure of the lexicon*

11 Lin Wang, Weimin Mou (University of Alberta), *The effect of familiarity on human adults' use of geometry and feature in reorientation*

12 Sophia van Hees, Sabine Seyffarth, Penny M Pexman, Ian S Hargreaves, Filomeno Cortese, Andrea B Protzner (University of Calgary), *An ERP investigation of visual lexical decision performance in competitive Scrabble players*

13 Kateryna Morayko, John R. Vokey (University Of Lethbridge), *The whole comes before the bits*

14 Chelsea Ekstrand, Eric Lorentz, Layla Gould, Marla Mickleborough, Ron Borowsky (University of Saskatchewan), *Feeling it: Object processing is aided by somatosensory stimulation*

15 Shrida S. Sahadevan, Yvonne Y. Chen, Sandra A. Wiebe, Jeremy B. Caplan (University of Alberta), *The memory for associations is changed by imagery-based memory strategies: An event-related potential study*

16 Alain Morin, Leanna Clement (Mount Royal University), *Toward a glossary of self-related terms*

18 Catherine Ortner, Abbey McAuley (Thompson Rivers University), *Comparing the effort involved in regulating emotions when generating or provided with reappraisals*

19 Sayeed A. D. Kizuk, Kyle E. Mathewson (University of Alberta), *Entrainment of alpha oscillations with rhythmic visual stimulation depends on endogenous spatial attention*

20 Layla Gould, Marla Mickleborough, Chelsea Ekstrand, Eric Lorentz, Ron Borowsky (University of Saskatchewan), *Contributions of the putamen during lexical and sublexical reading: An fMRI study*

21 Jeffrey Sawalha, J. Nankoo, D. Wylie, C. Madan, A. Friedman, Q. Vuong, M. Spetch (University of Alberta), *The use of shape and motion cues for object perception in pigeons*

22 Karen (Yu) Du, Marcia L. Spetch, Weimin Mou (University of Alberta), *The use of vertical height cues in spatial reorientation*

23 Alison Heard, Penny Pexman (University of Calgary), *Lifestyles of the rich and semantic: Identifying the semantic dimensions that drive verb identification*

24 Tyler Harrison, Chris Madan, Kyle Mathewson (University of Alberta), *Non-contact measurement of cognitive, emotional, and physiological changes in heart rate with a webcam*

25 Brea Chouinard, Jacqueline Cummine, John Hollinger, Joanne Volden (University of Alberta), *Evaluation of the metaphor interference effect*

26 Devon Currie, Glen E. Bodner (University of Calgary), *Haettenschweiler font is disfluent… but does it improve memory?*

Saturday Posters

2 Brian Steele (University of Alberta), Ana Gantman, Peter Mende-Siedlecki, Jay Van Bavel (New York University), Kyle E. Mathewson (University of Alberta), *How early in the perceptual processing stream do moral words bias brain activity?*

3 Bob Uttl (Mount Royal University), Carmela White (University of British Columbia Okanagan), Joy Hodgson (Mount Royal University), *Students' engagement and performance in an introductory statistics course*

4 Mehreen Nadeem, Peter Dixon (University of Alberta), *The effect of semantics on motor control*

6 Famira Racy (Mount Royal University), *Inner-speech deficits in ASD: A critical review*

7 Adam Morrill, Zacnite May (University of Alberta), Trevor Hamilton (MacEwan University), *Does size matter? Familiar object preference in zebrafish*

8 Ruojing Zhou, Weimin Mou (University of Alberta), *What makes it harder? Uncertainty of relations between reference points may hinder cognitive mapping in a boundary*

9 Marla Mickleborough, Layla Gould, Chelsea Ekstrand, Eric Lorentz, Paul Babyn, Tasha Ellchuk, Ron Borowsky (University of Saskatchewan), *Visual habituation in people with migraine*

10 Mabel Yu (Mount Royal University), *Mind full or mindful? The intercorrelations between mindfulness, borderline personality traits, and well-being*

11 Giancarlo Diano, Scott W. Allen, John R. Vokey, Kateryna Morayko, Lauren Vomberg (University of Lethbridge), *The outspoken nature of implicit knowledge*

12 Angela M. Lambert, Glen E. Bodner (University of Calgary), *Evaluating the basis of the production effect in long-list recall*

13 Aadil Dharamsi, Lynne Honey (MacEwan University), *Credit where credit isn't due: do dark triad traits predict exploitative behaviour?*

14 Tony Chaston, John Bailey (Mount Royal University), *Distance and time estimation of outdoor routes: Videos and virtual gaming environments*

15 Erica Ingraham, Matthew S. Ross, Trevor J. Hamilton (MacEwan University), *Alberta's growing footprint: The impact of oilsands process water on fish behaviour*

16 Sandra Wiebe (University of Alberta), Caron Clark (University of Arizona), Desiree de Jong (University of Massachusetts-Amherst), Nicolas Chevalier (University of Edinburgh), Kimberly Andrews Espy (University of Arizona & University of Nebraska-Lincoln), Lauren Wakschlag (Northwestern University), *Self-regulation in early childhood: Relations with gender and prenatal tobacco exposure*

17 Zorry Belchev, Glen E. Bodner (University of Calgary), *Inducing preference reversals in aesthetic choices*

18 Evan Poncelet (University of Saskatchewan), Benjamin Schultz (Université de Montréal), Janeen Loehr (University of Saskatchewan), *We did it: Mutual adaptation creates a sense of joint agency*

19 Sarah O. M. Keller, Jennifer Briere, Tammy A. Marche (University of Saskatchewan), *Comprehensive narrative elaboration technique (CNET): Comparing recall between older and younger adults*

20 Adrian Johnson, Rodney Schmaltz (MacEwan University), *Need for cognition, materialism, and music preference*

21 Nicole Czemeres, Janeen Loehr (University of Saskatchewan), *We or me? Investigating the sense of agency in joint action*

22 Parker Banks, John R. Vokey (University of Lethbridge), *No programming required*

23 Cassidy Wilson, Bob Uttl (Mount Royal University), *Prospective memory and nicotine use: A systematic review*

24 David Sidhu, Penny Pexman (University of Calgary), *A rose going by the name Molly may seem sweeter*

25 Morgan Teskey (University of Calgary), *Embodied cognition and ambiguous emotion language processing*

26 Laura M. Grant, Bob Uttl, Kelsey Cnudde (Mount Royal University), *Reliability of prospective memory measures: A systematic review*

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Notes