



35th Banff Annual Seminar In Cognitive Science

Friday April 29

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 **Olav Krigolson** (University of Victoria), *Why We Don't Learn From Our Mistakes*

We have all been told that we learn from our mistakes – but as it turns out that is simply not true. Instead, a growing body of evidence suggests that we actually learn when expectations differ from outcomes. Typically, learning theorists refer to the deviation between expectancies and outcomes as prediction errors. Over the past 20 years a multitude of neuroimaging studies support theoretical accounts of learning – neural learning signals within the human brain appear to reflect prediction errors and do not encode rewards and punishments in an absolute sense. Here, I will review work from my laboratory that has showed how electroencephalography can be used to track human learning, I will provide a unifying framework for a learning system within the medial-frontal cortex, and I will also review some of our more recent work outlining factors that do impact the learning system within our brain.

6:30 pm Dinner break

8:00 pm Poster session (with open bar)

9:30 pm Reception (with open bar)

Saturday April 30

8:30 am Coffee, tea, juice, pastries

9:00 am **Sue Becker** (McMaster University), *More than Memory: The Role of the Hippocampus in Modulating Behaviour, Future Planning, and Stress Regulation*

The hippocampus plays a crucial role in the formation and recall of episodic and contextual memories. More recent work also implicates this brain region in the contextual guidance of action selection, planning for the future, and modulating responses to stress. One factor that may contribute vitally to these functions is ongoing adult neurogenesis. However, a variety of lifestyle factors including chronic stress and alcohol abuse are neurotoxic to hippocampal tissue. In adult rodents, even a few days of stress or alcohol bingeing disrupts the ongoing production of neurons in the hippocampus. Moreover, reduced neurogenesis is associated with selective deficits on high interference memory tasks and an increased vulnerability to subsequent chronic stress exposure. Consistent with the rodent literature, in healthy young adults and in a clinically depressed sample, we find that high stress/depression scores and self-reported early onset alcohol bingeing are associated with deficits on high interference memory tasks. On the other hand, aerobic exercise renormalizes stress and depression scores and boosts neurogenesis-dependent memory. Preliminary data suggest that yoga may have similar benefits. Moreover, in rodents, we find that exercise combined with an anti-oxidant and anti-inflammatory rich dietary supplement ameliorates

the effects of chronic stress, reducing structural damage to the hippocampus, loss of neurogenesis and anhedonia. The combination of exercise and diet holds great promise for promoting healthy aging and treating stress-related psychiatric disorders and dementia.

10:15 am Coffee, tea, juice

10:30 am **Jelena Ristic** (McGill University), *What's New in Attention?*

Traditionally, studies of human attention have been grounded in a theoretical model that divides attentional processes to those driven by external sensory information (i.e., exogenous or automatic attention) and those driven by internal goals of an individual (i.e., endogenous or voluntary attention). More recent investigations however suggest that this classic conceptualization does not capture the range of attentional processes occurring in life. Collectively, these new data suggest that attention is a complex ability, which along with the nature of control also varies with environments and individuals. Emerging alternative models that incorporate these new findings will be discussed.

11:45 pm Lunch break

1:15 pm Poster session

2:45 pm **Jennifer Steeves** (York University), *Seeing the Forest but not the Trees: Studies of Real and Virtual Lesions*

Research over the last few decades has shown that there are discrete brain regions that process visual image categories such as faces, objects and scenes. My basic science research examines some of the cortical areas involved in visual image processing using brain stimulation, patient, and fMRI approaches. We have shown that the “occipital face area” plays a greater role in face recognition than had been previously thought (Solomon-Harris et al., 2013; Steeves et al., 2006, 2009), challenging the dominant strictly hierarchical view of face recognition. In some of our recent work, we have shown that scene recognition can operate independently of object recognition—that is, it does not operate strictly in a bottom-up manner, assembling a representation of a scene from its component objects (Ganaden et al., 2013; Mullin & Steeves, 2011, 2013; Rafique, et al., 2015; Steeves et al, 2004). We temporarily disrupt object processing using transcranial magnetic stimulation (TMS) to the LOC, the brain area that codes objects. We have shown downstream interactions between these object and scene regions suggesting separate but interactive pathways for object and scene processing that is evident both at a behavioural (Mullin & Steeves, 2011) and neural level (Mullin & Steeves, 2013, Rafique, et al., 2015). This research furthers our understanding of how the brain constructs the visual world around us.

4:00 pm Coffee, tea, juice, cake

4:15 PM **Allison B. Sekular** (McMaster University), *The Many Faces of Face Perception*

Faces are one of the most important stimuli in our environments: They help us recognize friends, avoid foes, and interpret emotion from both. Despite their general importance for guiding our social interactions, we understand relatively little about the mechanisms underlying face perception. Although it has been widely assumed that specialized, holistic processes are critical for the processing of upright faces, recent research from our lab and others challenges that long-standing notion. I will discuss a series of behavioural and electrophysiological results from both younger and older observers that highlight the importance of an individual differences approach and the critical roles of facial orientation structure and of experience, learning, and context in face processing and recognition.

5:30 pm Closing remarks

6:00 pm Adjourn

Friday Posters

- 1 David Sumantry, Craig Blatz (MacEwan University), *Misinterpreting certainty for ideology: Strength of belief is mistaken for extremism*
- 2 Kelsey Cnudde, Laura Grant, Bob Uttl (Mount Royal University), *Intelligence, individual differences, and prospective memory*
- 3 Tamara Kumpan, Jessica Duris, Brian Duffels, Paul Siakaluk (University of Northern British Columbia), *The processing of pain related words*
- 4 Raphaëlle Robidoux, Chrissy M. Chubala (University of Manitoba), Alexandre Lafrenière, Éva Nadon (University of Montreal), *The new ethics of cognition: A discussion on the ethical dilemmas of research in a modern world*
- 5 Jessica Elsom (Mount Royal University), *Self-talk modification and young offender reoffence*
- 6 Christa Engel, Rodney Schmaltz (MacEwan University), *Perceptions of a mock dating profile*
- 7 Layla Gould, Chelsea Ekstrand, Eric Lorentz, Sarah Wingerak, Marla Mickleborough, Ron Borowsky (University of Saskatchewan), *Effects of rhythmic priming on reading aloud: A behavioural and fMRI study*
- 8 Anika Sehgal, Kaitlin Tompkins, Malinda Desjarlais (Mount Royal University), *An eye-tracking study of self-regulated learning in a multimedia environment*
- 9 Scott Stone, Matthew S. Tata, Claudia L. R. Gonzalez, Tobi Delbrück (University of Lethbridge), *Computational model of motion sensitive cells using a neuromorphic artificial retina*
- 10 Jason Flindall, Claudia L. R. Gonzalez (University of Lethbridge), *Big wide goal, or in the tiny hole? Grasp-to-place kinematics are independent of objective aperture*
- 11 Ashtin Halmrast, Javid Sadr (University of Lethbridge), *Clarity and preference in face perception*
- 12 Yvonne Chen, Jeremy B. Caplan (University of Alberta), *The neural mechanism of associative recognition memory from encoding to retrieval*
- 13 Steven L. Prime (University of Saskatchewan), Paige Badart, John McDowall (Victoria University of Wellington), *Is enhanced focused attention in meditators consistent across modalities?*
- 14 Kenichi Kato, Jeremy B. Caplan (University of Alberta), *Order-recognition could reveal the structure of association-memory*
- 15 Tomi Ann Limcangco, Kenichi Kato, Jeremy B. Caplan (University of Alberta), *Louise Lake or Lake Louise? Visual imagery helps preserve memory for order within word pairs*
- 16 Jeremy Caplan (University of Alberta), Chris R. Madan (Boston College), *Imageability may act via the hippocampus to enhance memory for word pairs*
- 17 Ashlyn Munn, Andrew Howell (MacEwan University), *Mental disorder label reappropriation: Effects of self- and other-labelling on social perceptions*
- 18 Nicole Czemerer, Janeen Loehr (University of Saskatchewan), *Predictability of others' actions modulates the sense of joint agency during interpersonal coordination*
- 19 Lin Wang, Weimin Mou (University of Alberta), *Interaction between geometry and feature during reorientation in familiar and unfamiliar rooms*

- 20 Erica Loh, Trevor Hamilton, Melike Schalomon (MacEwan University), *Anxiolytic effects of the benzodiazepine chlordiazepoxide in zebrafish*
- 21 Lauren Slavik, Nicole Czemerer, Janeen Loehr (University of Saskatchewan), *Spontaneous synergy: Intrinsic tapping rates influence joint agency during interpersonal coordination*
- 22 Lauren Vomberg, John Vokey (University of Lethbridge), *Gramamtical complexity in artificial grammar learning*
- 23 Adrian Johnson, Trevor Hamilton (MacEwan University), *The effects of Modafinil on Zebrafish*
- 24 Jonathan Kuziek, Kyle E. Mathewson (University of Alberta), *Red light, green light: Understanding the perceptual qualities of alpha inhibition and the role of attention in entrainment*
- 25 Carly P. King, Thomas Qiao, Steven L. Prime (University of Saskatchewan), *Are time-to-contact judgments for visual stimuli influenced by auditory pitch?*
- 26 Erik Jansen, Rodney Schmaltz (MacEwan University), *"This can't be right": Using a misinformation paradigm to reduce pseudoscientific beliefs*
- 27 Sarah Lozie, Alison Heard, Penny M. Pexman (University of Calgary), *How do children process negation? It's not as easy as 1-2-3*
- 28 Chantal Fillion (MacEwan University), *Mary had a little pram: Contrasting cues of chastity and parental investment*
- 29 Katrina H. McDougall, David M. Sidhu, Glen E. Bodner (University of Calgary), *Same beholder, different beauty: Preference reversals for pairs of paintings*

- 30 Karen (Yu) Du, Lei Zhang, Weimin Mou (University of Alberta), *Asymmetrical multimodal representation: The influence of visual and inertial systems on path integration*

Saturday Posters

- 1 Ian Newman, Valerie Thompson (University of Saskatchewan), *Implicit and explicit awareness of conflict and strategy choice during a base-rate task*
- 2 Rozee S. Pereverseff, GLen E. Bodner (University of Calgary), *Do protective effects of testing depend on misinformation format?*
- 3 Shae T. Jalava, Glen E. Bodner (University of Calgary), *Does corrective feedback improve forced-choice recognition accuracy?*
- 4 Jessica Duris , Tamara Kumpan, Brian Duffels, Paul Siakaluk (University of Northern British Columbia), *Processing of pain related words*
- 5 Nicole van Rootselaar, Jason W. Flindall, Claudia L. R. Gonzalez (University of Lethbridge), *Listen up: Attention to speech interacts with grasping kinematics*
- 6 Wesley Vuong, Sayeed A. D. Kizuk, Joanna MacLean, Clayton T. Dickson, Kyle E. Mathewson (University of Alberta), *Brains on oxygen: The effects of hyperoxia on resting state conditions*
- 7 Ruoqing Zhou, Weimin Mou (University of Alberta), *When boundary-related learning is not incidental: Perceived stability modulates cue-selection process in goal localization*
- 8 Lei Zhang, Weimin Mou (University of Alberta), *Position and heading estimations during driving in a large scale environment*
- 9 Jenna Brazier, James Taylor (Mount Royal University), *Romantic red effects while eye tracking: Unexplained moderation by time in the academic term*

- 10 Lara Coelho, Claudia L. R. Gonzalez (University of Lethbridge), *The contributions of vision and proprioception to hand perception*
- 11 Chelsea Ekstrand, Layla Gould, Eric Lorentz, Sarah Wingerak, Marla Mickleborough, Ron Borowsky (University of Saskatchewan), *Did you feel that? The bi-directional relationship between somatosensation and object processing*
- 12 Bob Uttl, Kelsey Cnudde, Laura Grant (Mount Royal University), *Meta analysis of multisection studies: Students' prior ability strongly predicts student achievement*
- 13 Brian Duffels, Lindsay Bell, Andrea Reimer, Paul Siakaluk, Jacqueline Pettersen, R. Luke Harris (University of Northern British Columbia), *Acute hyperglycaemia impairs prefrontal blood flow and oxygenation during declarative memory tests*
- 14 Sayeed Kizuk, Ankur Banerjee, Kyle E. Mathewson (University of Alberta), *The vision rhythm? Entrainment at multiple frequencies reveal differential interactions between neural rhythms and visual perception*
- 15 Kris Cormier, Jarrod Blinch, Claudia L. Gonzalez (University of Lethbridge), *Blind touching: A study in hemispheric asymmetries in the control of haptically-guided grasping*
- 16 Sage Brown, Sophia Van Hees, Andrea Protzner, Penny Pexman, (University of Calgary), *The effects of intensive training on neural activity during visual word recognition*
- 17 Jessica Joseph, Tru Kwong (Mount Royal University), *(Un)expectedly poor spellers: Do study results depend on the measure?*
- 18 Sucheta Chakravarty, Isha Ober (University of Alberta), Christopher R. Madan (Boston College), Yvonne Y. Chen, Esther Fujiwara, Jeremy B. Caplan (University of Alberta), *The role of feedback related negativity in a complex value learning task*
- 19 David M. Sidhu, Penny M. Pexman (University of Calgary), Jean Saint-Aubin (Université de Moncton), *Une round and un sharp: Grammatical gender and shape associations*
- 20 Bijan Mohamed, Sophia van Hees, Penny M. Pexman, Filomeno Cortese, Andrea B. Protzner (University of Calgary), *The neural and behavioural consequences of short-term lexical training*
- 21 Jarrod Blinch, Jon B. Doan, Claudia L. R. Gonzalez (University of Lethbridge), *Spatiotemporal coupling of bimanual reach-to-grasp movements*
- 22 Laura Grant, B. Uttl, K. Cnudde (Mount Royal University), *Prospective memory, depression, and anxiety*
- 23 Daphne Vrantsidis (University of Alberta), Caron A. C. Clark (University of Arizona), Nicolas Chevalier (University of Edinburgh), Kimberly Andrews Espy (University of Arizona), Sandra A. Wiebe (University of Alberta), *Differential effects of socioeconomic status on "cool" and "hot" executive functions in early childhood: Exploring proximal mechanisms*
- 24 Stanislau Hrybouski, Arash Aghamodammadi-Sereshki (University of Alberta), Christopher R. Madan (Boston College), Andrea T. Shafer (Wayne State University), Corey A. Baron, Peter Seres, Christian Beaulieu, Fraser Olsen, Nikolai Malykhin (University of Alberta), *Amygdala subnuclei response and connectivity during emotional processing*

- 25 Nate Nadolski, Courtney Bailey, Erica Ingraham, Matthew Ross, Trevor Hamilton (MacEwan University), *Sub-lethal effects of oil sands process water on zebrafish group behaviour*
- 26 Lenka Zdrzilova, Penny M. Pexman (University of Calgary), *Communicating the meaning of abstract words: Keeping it grounded and real*
- 27 Jesse Stanich, Penny Pexman, David Sidhu, Alison Heard (University of Calgary), *Does mindfulness affect lexical processing?*
- 28 Sarah Anderson, Sarah Anderson, Heather Jamniczky, Olav Krigolson, Kent Hecker (University of Calgary), *Using the event-related potential (ERP) technique to measure learning in anatomy education*
- 29 Sarah Wingerak, Layla Gould, Eric Lorentz, Chelsea Ekstrand, Ron Borowsky (University of Saskatchewan), *Reaction time and response duration: Investigating the cognitive architecture of the dual-route cascaded model of reading*
- 30 Xuehui Lei, Lei Zhang, Weimin Mou (University of Alberta), *Switching between global and local orientations*

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Notes