NOWCAM

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NorthWest Cognition and Memory

Cogito ergo incola aquilo occasus

NOrth**W**est **C**ognition **A**nd **M**emory

2015 Meeting

NOWCAM is an annual venue for students and researchers from the Pacific Northwest working in the general area of memory and cognition to meet and share their current research activities with an informed, sympathetic, and good-humored audience.

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NOWCAM Mission Statement

The aim of NOWCAM is to support Pacific Northwest faculty and student researchers working in the general area of memory and cognition by creating an annual venue in which they can share their current research activities with an informed, sympathetic, and good-humored audience. With the exception of keynote addresses, NOWCAM favors papers and posters presented by students (usually with faculty as co-authors). This gives students an opportunity to develop their chops, and faculty a chance to sit back and relax.

The Pacific Northwest is home to numerous wide-flung Psychology departments with strengths in cognition and memory. NOWCAM provides a forum for faculty and students from these departments to get together and discuss their latest research. Interactions with other researchers can spark innovations and cross-fertilizations that move the research forward in new and exciting ways. In any case, it's good fun to get together with friends and colleagues who share similar interests, chew the cognitive rag a bit, and quaff a beer or two over a good meal.

Steve Lindsay is Grand Poo-bah Mother Hen of NOWCAM, and the Exalted Order of the Group of 7 +/-2 consists of Deb Connolly (SFU), Daniel Bernstein (Kwantlen), Peter Graf (UBC), Ira Hyman (WWU), Mike Masson (UVic), and Don Read (SFU/UVic).

Acknowledgements

NOWCAM gratefully acknowledges financial support from Simon Fraser University, the University of British Columbia, the University of Victoria, the University of Washington, and Western Washington University, and from generous anonymous donations by a number of individuals attending past NOWCAM conferences.

Thanks this year to several individuals who have worked to make NOWCAM function: Chris Lalonde and Steve Lindsay for the work on the web and registrations; Ruth Hackler, Michael Valente, and the WWU Psychology Department staff for administrative support; the students in Ira Hyman's lab and other labs for pulling together some of the materials, putting together poster boards, and running registration; Larry Symons (serving in the thankless position of WWU Psychology Chair) for helping organize and making sure the budget works.

Registration

Registration will be available during poster sessions, prior to the keynote, and Saturday and Sunday mornings before paper sessions and during breaks.

Locations for Posters and Papers

The keynote address and the paper sessions will occur in room 204 of the Academic Instructional Center West. The poster sessions will happen in the Skybridge of Academic Instructional Center building (hereafter abbreviated AIC).

Poster Set-Up Information

Poster Boards will be available in AIC Skybridge by 3:30 pm Friday and will remain there throughout the conference. Thus there will be plenty of time to set your poster up. Friday night posters should be taken down at the end of the session so that Saturday posters can go up in the morning.

NOWCAM 2015
Western Washington University
May 8th to 10th

All paper sessions and the keynote address will be held in the Academic Instruction Center – West, room 204. The poster session will be held on the Skybridge of the Academic Instruction Center (on the 4th floor of the building, connecting the two wings of the building).

Friday Afternoon, May 8th

3:30 – 4:00 Registration in AW Lobby outside room 204

Paper Session 1: Embodied Cognition, Executive Function, and Language (AW 204)

4:00 – 4:10 Opening Remarks

4:10 – 4:30 Ragav Kumar, Michael E. J. Masson, & Daniel N. Bub
Action Representations Evoked by Objects

4:30 – 4:50 Corson N. Areshenkoff, Daniel N. Bub, & Michael E. J. Masson
Challenging the Embodied Language Hypothesis

4:50 – 5:10 Emanuela Yeung & Ulrich Müller
The Relation between Syntax and Executive Function in Preschoolers

Poster Session 1 and Registration: 5:30 – 7:00 (AIC Skybridge)

Saturday, May 9th

8:30 – 9:00 Coffee and Registration in AW Lobby outside room 204

Paper Session 2: Visual Search and Attention (AW 204)

9:00 – 9:20 Ashley Livingstone, Andrea Smit, Mateusz Michalik, Ralph Mistlberger & John McDonald
Tracking Attentional Performance in Morning Larks and Night Owls

9:20 – 9:40 Elisabeth Kreykenbohm, Bertrand Sager, Farhad Dastur, David Froc, & Daniel Bernstein
Motorcycle Conspicuity in Traffic: An Eye Tracker Study

9:40 – 10:00 Hayley Lagroix, Thomas Spalek, & Vincent Di Lollo
T1 Difficulty Modulates AB Magnitude When Measured with Accuracy but not Reaction Time

10:00 – 10:20 Danesh Shahnazian & Clay Holroyd
Recurrent Neural Network Modeling of Anterior Cingulate Cortex Function

10:20 – 10:40 James Patten, & Thomas Spalek
A Hawthorne Effect in Video-Game Players

Coffee break 10:45 – 11:15

Keynote Address (AW 204) 11:15 – 12:15
Norman Brown
University of Alberta
Transition Theory: Autobiographical Memory from the Bottom-up

Poster Session 2, Pizza, and Registration: 12:30 – 2:00 (AIC Skybridge)

Paper Session 3: Memory, Judgments, Decision Making (AW 204)

2:00 – 2:20 Mario Baldassari, Catalina Dau, & D. Stephen Lindsay
Investigating Police Investigators

2:20 – 2:40 Kaitlyn M. Fallow, Maximilian Rabe, & D. Stephen Lindsay
Response Bias in Recognition Memory for Paintings is Conservative Overall, but Item-Level Patterns Paint a More Complex Picture

2:40 – 3:00 Arig Aboulenein, Amy Nusbaum, John Hinson, & Paul Whitney
Even the Anxious are Flexible: The Effects of Trait Anxiety on Cognitive Flexibility

3:00 – 3:20 Cristina G. Wilson, Paul Whitney, & John M. Hinson
Reducing Risky Decision Bias in Older and Younger Adults: The Utility of Outcome Feedback

3:20 – 3:40 Cameron D. Hassall & Olave E. Krigolson
Exploring Exploration: Electroencephalographic Correlates of the Explore/Exploit Dilemma

Paper Session 4: Perception, Object Recognition, and Face Recognition (AW 204)

4:00 – 4:20 Jennifer Sanchez, Soley Pitre, Taryn Berhman, Buyun Xu, Liam Rourke, Alison Campbell, & James Tanaka
Improving the Early Detection of Melanomas Using Perceptual Training

4:20 – 4:40 Simen Hagen & James W. Tanaka
Exploring Expert Object Recognition by the Means of Fast Periodic Visual Stimulation

4:40 – 5:00 Michael Chin, Jim Tanaka, & Buyun Xu
How Do We Process Dynamic facial expressions: An Eye

5:00 – 5:20 Alison Campbell & James Tanaka
Individual Differences in Antisocial Traits Predict Posed Expression Production

Poster Session 1 and Registration: Friday, May 8th, 5:30 – 7:00 (AIC Skybridge)

1. Danesh Shahnazian & Clay Holroyd
   Recurrent Neural Network Modeling of Anterior Cingulate Cortex Function

2. Adam K. Baker & Mario Liotti
   Stereotypes, Cognition, and Ideology: An ERP Investigation on Implicit Bias among Conservatives and Liberals

3. Chad C. Williams, Cameron D. Hassall, & Olave E. Krigolson
   Reward Expectancy and the Reward Positivity: A Non-Linear Relationship

4. Sarah L. Gibbs, Cameron D. Hassall, & Olave E. Krigolson
   Contributions of Posterior Neural Systems to the Online Control of Movement

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7. Iloradanon Efimoff & Nicole Vittoz
   Wake up and smell the risk: Caffeine improves gambling task performance

8. Taylor Chestnut, Cameron D. Hassall, & Olave E. Krigolson
   Hemispheric differences of the visual cortex during motor control tasks

9. Natasha Pestonji & Peter Graf
   Word Crimes: Word identification difficulty improves memory

10. Rachelle Mills & Todd Haskell
    Finding the Balance: Bridging the Gap between Cognitive and Educational Research

11. Joseph S. Blythe, Madeline Jalbert, Kori Holt, Euphemia Lee , Norma Garcia, Kelsey Kharrazi, Alia Wulff, Kayleigh Cutshaw, & Ira Hyman
    Cognitive Load during Divided Attention Leads to Intrusive Rebound of Thoughts

12. Meghann Pasternak & Adam Krawitz
    Reevaluating Risky and Ambiguous Decisions with Cumulative Prospect Theory

13. Martin Vane-Hunt, Bertrand Sager, Andre Aßfalg, Ragav Kumar, & Daniel M. Bernstein
    A New Computerized Theory of Mind Task: The Sandbox Task

14. Vanessa Wong, Peter Lenkic, Jiaying Zhao, Alessandra DiGiacomo, David Wu, & Alan Kingstone
Consistency in fixing disposal bin positions yield faster and more efficient recycling behavior

15. Michael Chin, Jim Tanaka, & Buyun Xu
Where do you look on a smiling face?

Poster Session 2, Pizza, and Registration: Saturday, May 9th, 12:30 – 2:00 (AIC Skybridge)

1. Anna Maslany, Rebecca Stanczyk, Ashlee Ko, & Peter Graf
The beauty and the beast: An investigation of affect and attention

2. Sheila Tse, Shelby Marozoff, Kyle Gooderham, Simon Ho, James T. Enns, & Todd C. Handy
The Effect of Cognitive Load on Digital Maps

3. Talise N. Lindenbach, Cameron D. Hassall, & Olave E. Krigolson
Hot or not! Attractiveness is associated with reward processing the medial-frontal cortex

4. Regard Booy & Mario Liotti
Laugh, and Be Happy

5. Nathan J. Chen-Mack, Cameron D. Hassall, & Olave E. Krigolson
The role of attention in the online control of movement

6. Brianna Beaudry, Cameron D. Hassall, & Olave E. Krigolson
Human learning systems and movement outcome evaluation

7. Alex DiGiacomo & Melanie Yu
Attention in Cognitive Tasks

8. Nick T. Toews, Gabriel Deros, & Andrea Hughes
Evidence of Specificity with the Production Effect

9. Joshua Adams, David Yaghmourian, & Michelene Chi
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Posterior Parietal Processing of Environmental Changes

14. Janel Fergusson, Gunisha Kaltra, & Peter Graf
Time and Time Again: Comparison of Production and Reproduction Accuracy

15. Christopher Lee, Anna Maslany, & Peter Graf
Valence Contamination: Investigating Carryover Effects on Valence

16. Daniel Derksen, Martin Vane-Hunt, Karan Bola, & Daniel M. Bernstein
Social Cognition across the Lifespan

17. James Miller, Lawrence Behmer, Charlotte Koning, & Lisa Fournier
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18. Julie Chang & Peter Graf
Levels of Acculturation are Associated with Executive Function Task Performances

Program Abstracts

Paper Session 1: Embodied Cognition, Executive Function, and Language (AW 204)

Ragav Kumar, Michael E. J. Masson, & Daniel N. Bub: *Action Representations Evoked by Objects*

When cued to make hand actions with no object name present, subjects responded equally fast with dominant and nondominant hands. When primed with object names, subjects were faster when using their dominant hand and when the action was congruent with the typical orientation of the object's handle. These results suggest that viewing an object name when formulating an independent action intention evokes a particular action representation associated with that object.

Corson N. Areshenkoff, Daniel N. Bub, & Michael E.J. Masson: *Challenging the Embodied Language Hypothesis*

Embodied accounts hold that language comprehension is grounded in sensory-motor representation. In support of this view, research has demonstrated rapid motor priming effects for words associated with spatial directions such as up or down. We show that such effects are abolished when the implied spatial direction is not included in the response set. This finding calls into question the proposal that word meaning is grounded in spatial aspects of experience.

Emanuela Yeung & Ulrich Müller: *The Relation between Syntax and Executive Function in Preschoolers*

Based on classic theories of cognitive development, we explored the association between children's understanding of the structure of language (syntax) and different aspects of executive functioning (i.e., working memory, cognitive flexibility, and inhibitory control). Although previous studies have shown that children's verbal ability (or semantic knowledge) is related to EF, our findings suggest that understanding the relations between words may also be important in the development of flexible behaviour.

Paper Session 2: Visual Search and Attention (AW 204)

Ashley Livingstone, Andrea Smit, Mateusz Michalik, Ralph Mistlberger & John McDonald: *Tracking Attentional Performance in Morning Larks and Night Owls*

Morning larks and night owls reach peak performance at different times of day. Here, we used ERPs to track attention in a visual search task in which participants located a target while ignoring a salient distractor. Relative to afternoon sessions, night owls were impaired at suppressing an irrelevant distractor in morning sessions. The results provide a neural basis for cognitive performance decrements during off-peak times.

Elisabeth Kreykenbohm, Bertrand Sager, Farhad Dastur, David Froc, & Daniel Bernstein: *Motorcycle Conspicuity in Traffic: An Eye Tracker Study*

Motorcycle collisions are often attributed to poor conspicuity, but this attribution lacks empirical support. We used an eye tracker to examine gaze patterns in a change-blindness experiment, with cars and motorcycles as targets in images of traffic scenes. Detection rates were higher for motorcycles than cars. Additionally, saliency maps of our stimuli were not predictive of gaze data. We propose that motorcycle collisions are not due to low-level perceptual problems.

Hayley Lagroix, Thomas Spalek, & Vincent Di Lollo: *T1 Difficulty Modulates AB Magnitude When Measured with Accuracy but not Reaction Time*

Perception of the second of two targets (T1, T2) is impaired when presented soon after the first (attentional blink; AB). AB magnitude is indexed by differences in T2 performance between short and long inter-target lags. When measured with accuracy, larger ABs obtain with harder T1 tasks; however, with reaction time, ABs are invariant

with T1 difficulty. These divergent findings arise from a response ceiling confound inherent to the accuracy measure.

Danesh Shahnazian & Clay Holroyd: *Recurrent Neural Network Modeling of Anterior Cingulate Cortex Function*

To realize a unified theory of ACC function, we recently proposed that the ACC learns the value of tasks, selects tasks for execution, and applies control to ensure that the selected task is successfully completed. Here, we implement the proposed mechanism in a recurrent neural network architecture. The model simulates ensemble activity of ACC neurons at an abstract level, as well as signals associated with surprise, conflict, and error processing.

James Patten, & Thomas Spalek: *A Hawthorne Effect in Video-Game Players*

Video-game players (VGP) are thought to have improved speed of processing (SOP) relative to non-VGPs. We hypothesized that this improvement may be modulated by the extent to which VGPs felt that their performance was publicly observable. To test this hypothesis, we varied the presence/absence of publicly-available auditory feedback in a visual SOP task in which target-mask SOA was manipulated dynamically. VGPs showed improved SOP only in the feedback condition.

Paper Session 3: Memory, Judgments, Decision Making (AW 204)

Mario Baldassari, Catalina Dau, & D. Stephen Lindsay: *Investigating Police Investigators*

In past studies, students playing the role of crime investigator have not appropriately distinguished the quality of evidence given to them by good eyewitnesses from that given by poor eyewitnesses. We tested local police officers against a fresh sample of students to determine whether officers make better use of evidence given by both good and poor witnesses. We also conducted exploratory analyses on a series of behavioral measures.

Kaitlyn M. Fallow, Maximilian Rabe, & D. Stephen Lindsay: *Response Bias in Recognition Memory for Paintings is Conservative Overall, but Item-Level Patterns Paint a More Complex Picture*

Recognition memory response bias is consistently conservative on average when images of lesser-known masterwork paintings are used as stimuli. However, this seeming reluctance to endorse paintings as "studied" does not hold equally for all paintings in the stimulus set. We report results from item-level analyses and discuss item and context features that may contribute to this materials-based bias effect and to response bias and recognition accuracy in general.

Arig Aboulenein, Amy Nusbaum, John Hinson, & Paul Whitney: *Even the Anxious are Flexible: The Effects of Trait Anxiety on Cognitive Flexibility*

Anxiety can influence cognition by impairing the ability to focus on critical information or by increasing sensitivity to negative outcomes. This study examined how differences in level of trait anxiety influence cognitive flexibility, operationally defined in a reversal learning task that involved choices with uncertain outcomes. Results showed high trait anxiety negatively affected early learning / performance but did not affect post-reversal performance, indicating no observed impact on cognitive flexibility.

Cristina G. Wilson, Paul Whitney, & John M. Hinson: *Reducing Risky Decision Bias in Older and Younger Adults: The Utility of Outcome Feedback*

This study explored age-related differences in the ability to use feedback to overcome framing bias. Using a gambling task in which risks were initially ambiguous, we tested whether younger and older adults could use outcome feedback to decrease frame-driven disadvantageous choices. Both age groups reduced bias over trials, but older adults did so less effectively. Success at reducing bias was reflected in indices of affective and non-affective factors.

Cameron D. Hassall & Olave E. Krigolson: *Exploring Exploration: Electroencephalographic Correlates of the Explore/Exploit Dilemma*

Human decision making is often characterized as a tradeoff between exploring the environment and exploiting previous learning. To investigate this we had participants make choices in a sequential risk-taking task. We used response times to categorize choices as either explorations or exploitations and observed an exploration-related enhancement of the P300, a component of the human event-related potential thought to reflect internal decision process outcomes.

Paper Session 4: Perception, Object Recognition, and Face Recognition (AW 204)

Jennifer Sanchez, Soley Pitre, Taryn Berhman, Buyun Xu, Liam Rourke, Alison Campbell, & James Tanaka: *Improving the Early Detection of Melanomas Using Perceptual Training*

Skin cancer is the most common form of cancer among Canadians and has a 16% survival rate once it has spread. Unfortunately, the effectiveness of programs that train individuals to detect, categorize, or identify lesions is ineffective. Lay persons were given a pre-training test, followed by five sessions to test whether cancer diagnosis can be learned through expertise training. We found that expertise training significantly improves melanoma detection as measured by post-training performance.

Simen Hagen & James W. Tanaka: *Exploring Expert Object Recognition by the Means of Fast Periodic Visual Stimulation*

Expert category domains are thought to be instantiated within the human ventral visual pathway. For instance, differential responses to expert domains (e.g., faces, birds, cars, novel objects) have been shown in spatially localized areas using functional magnetic resonance imaging. In the current study we used fast periodic visual stimulation (FPVS) to explore the neural sensitivity to expert categories. Electroencephalogram was recorded from bird experts and bird novices, each presented with two trials of 60s sequences containing a base-bird (A, e.g., american robin) sinusoidally contrast-modulated at a presentation rate of 6 images per second (F=6Hz) with size varying every cycle to control for low-level adaptation effects. At every 5th cycle (F/5=1.2Hz), a different oddball-bird (e.g., northern cardinal, anna's hummingbird…) (B, C…) substituted the repeating base-bird (i.e., AAAABAAAACAAAAD…). The results showed that despite changes in low-level information (i.e., image size), the experts showed an adaptation in the right occipito-temporal channels (PO8, P8) in response to the base-bird within the first 18s of the 60s sequence, whereas the novices showed a sustained signal-to-noise ratio (SNR) throughout the entire sequence. For the oddball-birds, both experts and novices showed a significant SNR at the fundamental 1.2 Hz frequency and its harmonics that remained sustained across the entire 60s sequence and that peaked at the right occipito-temporal channels (PO8, P8). In summary, the experts but not the novices showed an adaption to the base-birds, however, within the same sequence, both the experts and novices showed a sustained response to the oddball-birds. These results indicate that the response to the base-bird and oddball-birds are more dissociated in experts than in novices.

Michael Chin, Jim Tanaka, & Buyun Xu: *How Do We Process Dynamic facial expressions: An Eye*

Understanding and perceiving facial expressions is vital for social communication. When evaluating an emotional expression, some regions of the face may contain more valuable information than others. The current study recorded eye-movements from 20 participants while viewing dynamic video stimulation of basic emotions varying in intensity. Certain patterns of attention changed as a result of intensity (ie. disgust and anger), providing some of the first dynamic expression eye-tracking results.

Alison Campbell & James Tanaka: *Individual Differences in Antisocial Traits Predict Posed Expression Production*

Social interactions are heavily moderated by the affective information communicated by facial expression, yet little is known about how expressiveness varies across individuals. We begin to explore individual differences in the production of emotional expression using computer emotion recognition technology to quantify emotional expression in a posed and spontaneous expression task. The main finding was that individual differences in antisocial traits predicted production ability for posed expressions.

Poster Session 1 and Registration: Friday, May 8th, 5:30 – 7:00 (AIC Skybridge)

Danesh Shahnazian & Clay Holroyd: *Recurrent Neural Network Modeling of Anterior Cingulate Cortex Function*

To realize a unified theory of ACC function, we recently proposed that the ACC learns the value of tasks, selects tasks for execution, and applies control to ensure that the selected task is successfully completed. Here, we implement the proposed mechanism in a recurrent neural network architecture. The model simulates ensemble activity of ACC neurons at an abstract level, as well as signals associated with surprise, conflict, and error processing.

Adam K. Baker & Mario Liotti: *Stereotypes, Cognition, and Ideology: An ERP Investigation on Implicit Bias among Conservatives and Liberals*

The present study examines the process of implicit categorization across groups of liberals and conservatives. My research explores EEG recordings of the N400 event-related potential (ERP), which is modulated by semantic violations, such as stereotypes. This study will also investigate how different stimulus onset asynchronies affect the N400 amplitude, suggesting the stimulus onset asynchrony of a prime and target word in a gender paradigm highlights the differences in semantic processing.

Chad C. Williams, Cameron D. Hassall, & Olave E. Krigolson: *Reward Expectancy and the Reward Positivity: A Non-Linear Relationship*

In the present study, we sought to investigate the effect of task performance expectancies on reward prediction error signals. Participants engaged in a time estimation task with varying difficulty while electroencephalography data was recorded. Our results indicate a non-linear relationship between task performance expectancies and reward prediction error signals.

Sarah L. Gibbs, Cameron D. Hassall, & Olave E. Krigolson: *Contributions of Posterior Neural Systems to the Online Control of Movement*

This study investigated the contribution of posterior neural systems to the online control of movement. Participants performed an aiming task with varying degrees of control over a movement effector to targets that changed position unexpectedly while electroencephalographic (EEG) data was recorded. Our results suggest that posterior neural systems are engaged to a greater extent when the participants have the ability to modify their movements.

Quentin Raffaelli, William Kendall, Alan Kingstone, & Rebecca M. Todd: *Are cartoon faces real faces?*

Cartoons permeate many aspects of life; e.g., communication software includes many expressive cartoon faces. But why are cartoons appealing? To explore this, we aimed at determining whether expressions are recognized more easily when cartoon-like. Participants detected emotions on faces at five levels of cartoonization, presented from 17 to 66ms. At the shortest presentation times, accuracy increased as stimuli became more cartoonized. Results suggest perception is easier in less realistic images.

Alessandra DiGiacomo, David W.L. Wu, Peter Lenkic, Bud Fraser, Jiaying Zhao, & Alan Kingstone: *Convenience Improves Composting and Recycling Rates in Residential Buildings*

Over the past few decades, the scarcity of landfill space coupled with a greater awareness of the current environmental crisis has created an urgent need for research in sustainable behavior. This is the first experimental study demonstrating that convenient waste disposal boosts recycling and compost rates in university student residences and multi-family dwellings alike.

Iloradanon Efimoff & Nicole Vittoz: *Wake up and smell the risk: Caffeine improves gambling task performance*

We investigated caffeine effects on performance in the Iowa Gambling Task (IGT) and the Balloon Analogue Risk Task (BART). Caffeine improved performance on the IGT when individual difference variables of decision making

style, impulsivity, and gender were taken into account. Risk propensity, sleep amount, gender, and habitual caffeine consumption significantly predicted performance on the BART, but caffeine had no effect. These results were surprising given previous research on sleep-deprived individuals.

Taylor Chestnut, Cameron D. Hassall, & Olave E. Krigolson: *Hemispheric differences of the visual cortex during motor control tasks*

The present study aims to investigate hemispheric differences of the visual cortex during a motor control task. Participants performed an aiming task in which the target was shown in either the left or right visual field while electroencephalogram (EEG) data was recorded. Analysis of the EEG data revealed contralateral activity during target jumps indicating that attentional processes are needed to subserve the online control of movement.

Natasha Pestonji & Peter Graf: *Word Crimes: Word identification difficulty improves memory*

Words are rated as more familiar if somehow 'revealed' by solving a puzzle (the Revelation Effect). We implemented a revelation procedure by displaying familiar words obscured by line-grid masks, varying in density (obscuring words to different degrees). During encoding, participants made liking ratings of word, followed by a brief delay and old/new recognition test. Results showed mask density was negatively correlated with mask density, and positively correlated with memory performance.

Rachelle Mills & Todd Haskell: *Finding the Balance: Bridging the Gap between Cognitive and Educational Research*

The learning of concepts and categories interests both cognitive psychologists and educators. However, we still don't really know how best to teach novel concepts. One challenge is that cognition research often lacks ecological validity while education research often isn't well controlled. We used a balanced approach to examine the effect of positive and negative instances during learning. Our findings highlight the importance of using real-world categories in category learning research.

Joseph S. Blythe, Madeline Jalbert, Kori Holt, Euphemia Lee , Norma Garcia, Kelsey Kharrazi, Alia Wulff, Kayleigh Cutshaw, & Ira Hyman: *Cognitive Load during Divided Attention Leads to Intrusive Rebound of Thoughts*

Cognitive load demanded by a distractor task while listening to music influences the probability of experiencing involuntary songs during subsequent tasks. We have found that high cognitive load tasks increase the probability of songs returning to awareness more than low cognitive load tasks. One possible explanation is that people suppress awareness of background music during demanding tasks resulting in the songs rebounding into awareness on subsequent tasks.

Meghann Pasternak & Adam Krawitz: *Reevaluating Risky and Ambiguous Decisions with Cumulative Prospect Theory*

Previous studies modeling choice preference using Expected Utility (EU) Theory have concluded that ambiguity and risk engage disparate processes. We demonstrate that Cumulative Prospect Theory (CPT) provides a more robust account of individual differences in risky decision-making patterns. Moreover, EU derived risk preference parameter values are uncorrelated with those derived from CPT modeling. Therefore, the underlying relationship between ambiguous and risky decision-making has yet to be appropriately examined.

Martin Vane-Hunt, Bertrand Sager, Andre Aßfalg, Ragav Kumar, & Daniel M. Bernstein: *A New Computerized Theory of Mind Task: The Sandbox Task*

Theory of mind (ToM) is the recognition that other people's minds have a different understanding from one's own mind. ToM supports successful communication, empathy, and perspective taking. Eighty-four participants completed a computerized ToM task called the Sandbox task, using either a mouse or a touchscreen. Both conditions produced a ToM effect: participants were biased towards their own privileged knowledge when estimating for a naïve story protagonist.

Vanessa Wong, Peter Lenkic, Jiaying Zhao, Alessandra DiGiacomo, David Wu, & Alan Kingstone: *Consistency in fixing disposal bin positions yield faster and more efficient recycling behavior*

Sustainable behaviour is increasingly important to our society. We investigated how consistency in disposal bin colour and bin position affect recycling behaviour. Using a touchscreen reaching task, we find support that fixing bin positions consistently across trials significantly reduced reaction times and increased efficiency in waste disposal. This suggests sustainable behaviour can be encouraged by fixing disposal bin positions consistently across society.

Michael Chin, Jim Tanaka, & Buyun Xu: *Where do you look on a smiling face?*

Understanding and perceiving facial expressions is vital for social communication. When evaluating an emotional expression, some regions of the face may contain more valuable information than others. The current study recorded eye-movements from 20 participants while viewing dynamic video stimulation of basic emotions varying in intensity. Certain patterns of attention changed as a result of intensity (ie. disgust and anger) providing some of the first dynamic expression eye-tracking results.

Poster Session 2, Pizza, and Registration: Saturday, May 9th, 12:30 – 2:00 (AIC Skybridge)

Anna Maslany, Rebecca Stanczyk, Ashlee Ko, & Peter Graf: *The beauty and the beast: An investigation of affect and attention*

Attention is determined by intrinsic attractiveness (positive valence) or repulsiveness (negative valence). The dominant theory suggests that attentional scope is broadened by attractive stimuli and narrowed by repulsive stimuli. We showed undergraduates picture sequences (extremely positive, positive, neutral, negative and extremely negative). To assess attentional scope, after each sequence, participants completed Erikson flanker trials. Results suggest that both positive and negative images cause attention to narrow, relative to neutral images.

Sheila Tse, Shelby Marozoff, Kyle Gooderham, Simon Ho, James T. Enns, & Todd C. Handy: *The Effect of Cognitive Load on Digital Maps*

The study explored how cognitive load affects route and landmark learning when reading maps. High cognitive load reduces the size of the attentional window from which individuals can retrieve information. We hypothesized that high load will hinder the learning of widely spaced information like landmarks, but not narrow information like routes. Results suggest that our original hypothesis was supported in the male population, however, the effect is reversed for females.

Talise N. Lindenbach, Cameron D. Hassall, & Olave E. Krigolson: *Hot or not! Attractiveness is associated with reward processing the medial-frontal cortex*

In this study, we sought to investigate whether or not reward systems within the human medial-frontal cortex were sensitive to attractiveness. In the present study participants viewed a series of faces and rated them in terms of attractiveness while electroencephalographic data was collected. Analysis of the EEG data revealed that there is greater medial-frontal activity when viewing an attractive face.

Regard Booy & Mario Liotti: *Laugh, and Be Happy*

Many therapeutic approaches rely on increasing positive experiences. However there is no direct evidence that this alters the cognitive mechanisms driving the disorder. Reaction times on the Negative Affective Priming task was used to measure inhibitory patterns for emotional words in 200 undergraduate females. A hierarchical multiple regression analysis suggests that a positive mood induction does moderate the relationship between response styles and inhibitory patterns, especially for positive words.

Nathan J. Chen-Mack, Cameron D. Hassall, & Olave E. Krigolson: *The role of attention in the online control of movement*

In the present experiment we examined where attention is allocated in the brain during error detection. To do this, participants completed an aiming task in which they fixated at various positions as targets jumped in the central or

peripheral visual fields while electroencephalographic (EEG) data was recorded. Our results demonstrate that attentional effects are observed when errors occurred in peripheral as opposed to central vision.

Brianna Beaudry, Cameron D. Hassall, & Olave E. Krigolson: *Human learning systems and movement outcome evaluation*

In the present experiment we were interested in assessing the role of the human medial-frontal cortex in outcome evaluation of movement. Here, we had participants complete reaching movements to a set target location while electroencephalographic (EEG) data was recorded. Our results suggest that a cognitive reinforcement learning system within the medial-frontal cortex plays a role in movement outcome evaluation.

Alex DiGiacomo & Melanie Yu: *Attention in Cognitive Tasks*

In 2011, we encountered five times as much information as we did in 1986, a difference which is the equivalent of 175 newspapers every day. Much of this information is delivered through technology, and research is increasingly showing that there are costs to our increased connectedness. We provide the first experimental evidence for IQ reductions when completing Raven's progressive matrices in a smart phone present versus smart phone absent condition.

Nick T. Toews, Gabriel Deros, & Andrea Hughes: *Evidence of Specificity with the Production Effect*

Researchers have found that speaking words aloud benefits recall over words read silently, due to increasing the distinctiveness of the word which enhances memory; this is the production effect (MacLeod et al., 2010). In our experiments we manipulated whether words were produced at encoding or at test. It appears that speaking aloud at encoding or at test benefits recognition.

Joshua Adams, David Yaghmourian, & Michelene Chi: *Differential Skill Pairing and Interaction Quality*

This study examines differential skill levels in dyads and depth of information processing. Specifically, we examine if the degree of collaborative knowledge construction--as opposed to the ability levels of partners--can predict STEM learning outcomes. We developed regression models for two data sets. Results indicated trend level significance in Study 1 and significance in Study 2 for processing depth, with no effect of ability difference.

Marianne P. Brimmell, Cameron D. Hassall, & Olav E. Krigolson: *Mechanisms behind movement errors in the elderly: Error evaluation deficits in medial-frontal cortex*

In the present study we sought to investigate the neural systems that evaluate movement errors in elderly adults. To accomplish this, young and elderly participants performed a continuous tracking task while EEG data was recorded. We found that the younger participants not only made fewer tracking errors than the elderly participants but that the elderly participants had significantly diminished FRN amplitudes.

Pamela A. Gant: *Taking a step back to think: Embodied metaphors and dual-process reasoning*

Embodied metaphors integrate sensory-motor experience into their overall representation of a concept. The current study focuses on two common idiomatic embodied metaphors: "taking a step back to think" and "jumping to conclusions." These phrases appear to be rooted in the dual-process system of human reasoning, a theoretical framework that describes System 1 as intuitive and System 2 as analytic. Preliminary analyses have shown participants to follow these rules with a movement manipulation during reasoning tasks.

Madeline Jalbert, Joseph Blythe, Euphemia Lee, Kori Holt, Norma Garcia, Kelsey Kharrazi, Alia Wulff, & Ira Hyman: *Using Songs to Explore Intrusive Thoughts*

What features make a thought feel intrusive? We investigated the level of intrusiveness experienced using songs stuck in one's head. We exposed people to snippets of songs and later checked if the song began playing in their heads and if it felt intrusive. We varied whether the individual retrieved the song voluntarily or involuntarily, the number of times the song was repeated, and whether the song was liked or disliked.

Rose J. Leishman, Cameron D. Hassall, & Olave E. Krigolson: *Posterior Parietal Processing of Environmental Changes*

The purpose of this study was to elucidate the role of posterior parietal processing in evaluating environmental changes. Using electroencephalography (EEG), we examined posterior parietal activity in subjects engaging in an aiming task wherein target jumps of varying magnitudes occurred randomly. Analysis of EEG data revealed that parietal activity scales to target jump magnitude.

Janel Fergusson, Gunisha Kaltra, & Peter Graf: *Time and Time Again: Comparison of Production and Reproduction Accuracy*

Timing is required for many common tasks, such as cooking an egg. Previous research has suggested that subjects underestimate intervals of 2-6 minutes, but the reason for this underestimation is unclear. One possibility is that subjects' reference memory for these intervals is inaccurate. In the present study, accuracy of productions and reproductions intervals from 2-6 minutes was compared. Subjects' subjective judgments of their accuracy were compared to their objective accuracy.

Christopher Lee, Anna Maslany, & Peter Graf: *Valence Contamination: Investigating Carryover Effects on Valence*

Valence is the intrinsic attractiveness or repulsiveness of a stimulus. We investigated the influence that valenced context had on a following target. Participants were shown picture sequences with the same valence rating (context) that were either followed by a positive, negative or neutral picture (target). Participants rated each picture. Results showed that targets were rated more negatively if they followed a negative context, compared to a neutral or positive context.

Daniel Derksen, Martin Vane-Hunt, Karan Bola, & Daniel M. Bernstein: *Social Cognition across the Lifespan*

This five-year longitudinal study examines social cognition and judgment and decision-making across the lifespan. We administered 10 tasks to 55 participants aged 3 to 73 years. On our social cognition tasks, participants demonstrated hindsight bias and theory of mind errors. On our judgment and decision-making task, participants demonstrated the sunk-cost fallacy. These preliminary results demonstrate the effectiveness of our tasks over a wide age range.

James Miller, Lawrence Behmer, Charlotte Koning, & Lisa Fournier: *Cueing Methods Moderate the Interaction Between Action Plans*

In motor planning, partial repetition costs result from certain patterns of overlap in the features of ongoing actions and those held in working memory. The present study manipulated the overlap of two sequences of button presses, and employed three cueing methods, to observe the interaction between cueing modality and feature overlap. Increases in reaction times and error rates were dependent upon the different cueing methods and overlap conditions.

Julie Chang & Peter Graf: *Levels of Acculturation are Associated with Executive Function Task Performances*

In line with previous cross-cultural research that suggests developmental differences in executive functions, we predicted that performance on inhibitory control tasks and on other executive-function tasks would correlate with degree of acculturation (i.e., assimilation of the individualistic cultural values). In contrast to previous research, our investigation with local students revealed a positive correlation between acculturation to the dominant culture and performance on working memory tasks and on tasks requiring inhibition.