

30th Annual
JOSEPH R. ROYCE
PSYCHOLOGY
RESEARCH CONFERENCE

March 11, 2016
8:30 am - 5:30 pm
Bernard Snell Hall

Keynote Address

Dr. Brad Postle

University of Wisconsin-Madison

Invited Internal Speaker

Dr. Don Kuiken

University of Alberta

Special Symposium: Left Turns in Research
organized by

Dr. Jeremy Caplan

University of Alberta



UNIVERSITY OF ALBERTA
DEPARTMENT OF PSYCHOLOGY

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Conference Organizing Committee

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Acknowledgement

The Royce Conference Organizing Committee thanks the Faculty of Science, Faculty of Arts, Campus Neuroscience Alberta, and Pearson Education for their generous support.

Program in Brief

8:00AM - 9:00AM



POSTER SETUP & COFFEE

9:00AM - 9:30AM



INVITED INTERNAL SPEAKER

Dr. Don Kuiken

9:30AM - 10:30AM



ORAL PRESENTATIONS SESSION 1

Do gestures serve an interpersonal function?

Yiwei Chen & Elena Nicoladis

Are executive functions involved in the processing of opaque compound words? A study of individual differences.

Juana Park, Faria Sana, Christina Gagné, & Thomas Spalding

Same storyteller, two languages, different stories: A comparison of bilingual children's Chinese and English narratives.

J. B. K. Koh, E. Nicoladis, & P. Marentette

A model for predicting emergent meaning during literary reading.

Shawn Douglas & Don Kuiken

10:30AM - 11:00AM



POSTER PRESENTATIONS & COFFEE

Program in Brief

11:00AM - 12:00PM



ORAL PRESENTATIONS SESSION 2

Living in history and culture: How public events, personal transitions, and culture affect the organization of autobiographical memory in Chinese older adults.

Xuan Gu, Norman R. Brown, & Chi-Shing Tse

The effect of immigration of the contents and organization of autobiographical memory.

Liangzi Shi, Felicia Nordlund, & Norman R. Brown

Cultural differences in spontaneous trait and situation inferences.

H. Lee, T. Masuda, Y. Shimizu, & J.S. Uleman

Gifted children: When numbers do not tell the whole story.

G. K. Georgiou, K. Dunn, & J.P. Das

12:00PM - 1:15PM



POSTER PRESENTATIONS & LUNCH

1:15PM - 2:30PM



SYMPOSIUM: LEFT-TURNS IN RESEARCH

Introduction

J.B. Caplan

Obstacles when studying obstacles: Interactions between attention and action impact emotional evaluations.

N. J. Wispinski, A. Singhal, J.T. Enns, & C.S. Chapman

Program in Brief

2:30PM - 3:15PM



Left turn now, right turn later: Studying cognitive processes across species using the midsession reversal procedure.

N. McMillan

So, uh, maybe Alberta toddlers are just stupider than Georgian toddlers?.

Elena Nicoladis

ORAL PRESENTATIONS SESSION 3

Inhibition of protein synthesis in the rat amygdala by anisomycin causes memory deficits at short- and long-term time points.

L.A. Rimstad, D. Treit, & C.T. Dickson

Personality and cerebral lateralization.

B.G. Cioceanu & P.L. Hurd

Red light, Green light: Understanding the perceptual qualities of alpha inhibition and the role of attention in entrainment.

Jonathan W.P. Kuziek & Kyle E. Mathewson

3:15PM - 3:45PM



POSTER PRESENTATIONS & COFFEE

3:45PM



KEYNOTE ADDRESS

Dr. Bradley Postle

Cognitive Neuroscience of Human Visual Attention and Working Memory

6:00PM



RECEPTION

Poster Program in Brief

P-01 Behavioural states consistent with deactivated hippocampal activity favour better subsequent memory performance.

B. E. Hauer (Neuroscience and Mental Health Institute, University of Alberta), L. A. Rimstad (Neuroscience and Mental Health Institute, University of Alberta), & C. T. Dickson (Neuroscience and Mental Health Institute, University of Alberta; Department of Psychology, University of Alberta; Department of Physiology, University of Alberta)

P-02 Vision-related quality of life of patients with hemianopia.

S. S. Sheldon & R. L. Woods (Schepens Eye Research Institute, Massachusetts Eye and Ear & Harvard Medical School, Boston, MA).

P-03 The Effects of Transcranial Direct Current Stimulation (tDCS) on a Discrete Naming Task in Healthy Adults.

Alesha J Reed BSc, (Communication Sciences and Disorders, University of Alberta), Shivraj S. Jhala, PhD (Communication Sciences and Disorders, University of Alberta), Carol A Boliek, PhD (Communication Sciences and Disorders & Neuroscience and Mental Health Institute, University of Alberta) and Jacqueline Cummine, PhD (Communication Sciences and Disorders & Neuroscience and Mental Health Institute, University of Alberta)

P-04 Comparison of Note Compositions Between Sexes of Black Capped Chickadees.

H.F Warren, K.A Campbell, C.B. Sturdy (Psychology Department, University of Alberta)

P-05 The effects of conspecific and heterospecific vocalizations on ZENK expression in the zebra finch (*Taeniopygia guttata*) auditory forebrain.

T. Intaprasert (Biological Science, University of Alberta), E.N. Scully, A.H. Hahn, K.A. Campbell, N. McMillan, J.V. Congdon, and C.B. Sturdy (Psychology Department, University of Alberta)

P-06 Taking off the training wheels: Measuring auditory P300 during outdoor cycling using an active wet EEG system.

K. A. Townsend, D. L. Cormier, J. E. M. Scanlon, J. W. P. Kuziek, K. E. Mathewson (Department of Psychology, Faculty of Science, University of Alberta; Neuro

science and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta)

P-07 Neurophysiological mechanisms of the effect of aging on context use in sentence comprehension.

Shrida S. Sahadevan, Esther S. Kim, Jacqueline Cummine (Faculty of Rehabilitation Medicine & Department of Communication Sciences and Disorders, University of Alberta)

P-08 Diffusion Kurtosis Imaging in Persistent Developmental Stuttering.

Ehsan Misaghi (Neuroscience and Mental Health Institute (NMHI), Faculty of Medicine and Dentistry, University of Alberta; Institute for Stuttering Treatment and Research (ISTAR), Faculty of Rehabilitation Medicine, University of Alberta), Jacqueline Cummine (Neuroscience and Mental Health Institute (NMHI), Faculty of Medicine and Dentistry, University of Alberta; Department of Communication Sciences and Disorders, Faculty of Rehabilitation Medicine, University of Alberta), Deryk S. Beal (Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital; Department of Speech-Language Pathology, Faculty of Medicine, University of Toronto)

P-09 Oxygenating the brain: Examination of spontaneous EEG activity across normoxia and hyperoxia.

Wesley Vuong (Department of Psychology at the University of Alberta Clayton T. Dickson (Department of Psychology, Department of Physiology, & Neuroscience and Mental Health Institute at the University of Alberta) Kyle E. Mathewson (Department of Psychology & Neuroscience and Mental Health Institute at the University of Alberta) sad

P-10 Effects of Mask Duration on the Priming of Pseudo-compounds.

Whitney Fox, Jasmine Burry, Tori Robinson, Christina L. Gagné, & Thomas L. Spalding (Department of Psychology, University of Alberta)

P-11 The effect of serial vs. isolated processing on good and poor readers' naming performance.

A. Altani, M. Boonstra, & G. K. Georgiou (Department of Educational Psychology, University of Alberta)

P-12 Memory for order of items within word-pairs: the effects of simple strategies.

P-13 Do cues make a difference in perception? An investigation of humans' ability to differentiate arousal levels of animal vocalizations.

N. K-H. Yang, J. V. Congdon, J. Hoang (Psychology Department, University of Alberta), P. Filippi (Artificial Intelligence Laboratory, Vrije Universiteit Brussel; Center for Mind, Brain and Cognitive Evolution, Ruhr University Bochum), D. L. Bowling, S. A. Reber, A. Pašukonis (Department of Cognitive Biology, University of Vienna), & C. B. Sturdy (Psychology Department, University of Alberta)

P-14 Toward the assessment of the kinesthetic memory span.

D. Pinzon (Surgery Department, University of Alberta), R. Vega (Computing Science Department, University of Alberta), B. Zheng (Surgery Department, University of Alberta)

P-15 Annoying the driver: Effects of Social and Emotional Distractions on Driving.

Scanlon, J. E. M. (Department of Psychology & Neuroscience and Mental Health Institute at the University of Alberta) Salopek, M. E. (Department of Psychology at the University of Alberta) Singhal, A. (Department of Psychology & Neuroscience and Mental Health Institute at the University of Alberta)

P-16 Correlation between verbal abilities and working memory performance.

T. Baird, M. Warren, U. Rai, K. Holmstrom & S. A. Wiebe (University of Alberta)

P-17 Imagery-based memory strategies and the electrophysiology of association-memory encoding.

Y.Y. Chen (Neuroscience and Mental Health Institute, University of Alberta), S.S. Sahadevan (Faculty of Rehabilitation Medicine, University of Alberta), S.A. Wiebe & J.B. Caplan (Neuroscience and Mental Health Institute, Department of Psychology, University of Alberta)

P-18 Memory for order within associations can be dissociated from association-memory.

Kenichi Kato and Jeremy B. Caplan (Psychology Department, University of Alberta)

P-19 Modification effects in compound nouns with novel modifiers.

Sara Laughton, Meagan Anderson, Alexandra Besoi, Christina Gagné, and Thomas

P-20 Comparing grouping effects of two order memory tasks.

Yang Liu (Psychology Department, University of Alberta) & Jeremy B. Caplan (Psychology Department and Neuroscience and Mental Health Institute, University of Alberta)

P-21 The role of feedback related negativity in indexing prediction error might extend to complex value learning tasks.

Sucheta Chakravarty (Department of Psychology, University of Alberta), Isha Ober (Neuroscience and Mental Health Institute, University of Alberta), Christopher R. Madan (Department of Psychology, University of Alberta; Department of Psychology, Boston College), Yvonne Y. Chen (Neuroscience and Mental Health Institute, University of Alberta), Esther Fujiwara (Department of Psychiatry, University of Alberta; Neuroscience and Mental Health Institute, University of Alberta), Jeremy B. Caplan (Department of Psychology; University of Alberta, Neuroscience and Mental Health Institute, University of Alberta)

P-22 Processing ambiguity in emotional facial expressions: Role of alexithymia.

Indra Roy, Alex MacRae-Korobkov, Alexa Nydegger, Angela Ma, Esther Fujiwara

P-23 Adults high on Autism Spectrum Quotient tend to speak less.

R.L. Enns, Y. Chen, & E. Nicoladis

P-24 Music as medicine: A random control trial of music therapy intended to reduce BPSD in long-term care residents with dementia.

D. Milke (CapitalCare), J. Leask (CapitalCare), E. Truscott (University of Alberta) & J. Lee (University of Alberta)

P-25 Playing with cards: Preservation of emotion-focused preferences in Alzheimer's disease.

L. Bohn (Psychology Department, University of Alberta), S. T. Kwong See (Psychology Department, University of Alberta), & H. H. Fung (Psychology Department, The Chinese University of Hong Kong)

P-26 Musical intervals, neural networks, and coarse coding.

Brittany Koch-Hale and Michael R.W. Dawson (Biological Computation Project, Department of Psychology, University of Alberta)

- P-27 Investigating the neural network of spelling.**
Kulpreet Cheema & Jacqueline Cummine (Faculty of Rehabilitation Medicine, University of Alberta)
- P-28 Vive la différence! Why bilinguals gesture.** J. R. Aziz & E. Nicoladis
(Psychology Department, University of Alberta).
- P-29 Keeping relationships afloat: An investigation of factors that correlate with implicit theories of relationships.**
V. Bergstrom (Psychology Department, University of Alberta)
- P-30 The Modification Effect in Opaque-Transparent Compounds.**
L. Chin, A. Besoi, C. Gagné & T. Spalding (Psychology Department, University of Alberta)
- P-31 Language and acculturation among Chinese immigrants.**
M. Chen, W. Hua, K. A. Noels & L. Yao (Psychology Department, University of Alberta).
- P-32 Healing through Vulnerability and Storytelling.**
Tony Luong & Elena Nicoladis (Women's and Gender Studies & Psychology Department, University of Alberta).
- P-33 A Qualitative Study: Investigating the Assets and Liabilities of Requiring Foreign Language Courses in Canadian universities.**
D. Kwon (Psychology Department, University of Alberta), X. Zhang (Educational Psychology Department, University of Alberta) & K. A. Noels (Psychology Department, University of Alberta)
- P-34 The language-identity link in international students to Canada.**
G. L. Diniz, K. A. Noels, A. Jackson (University of Alberta).
- P-35 A study of international students' language aptitude and adjustment under stereotype threat.**
R. Chakrabarty, K. Chaffee, N.M. Lau, K. Noels (Psychology Department, University of Alberta)

P-36 How Entity and Incremental Language Mindsets Affect Attitudes towards Immigration Policy.

T. Irvine, M. Elliott, M. Lou, & K. A. Noels (Psychology Department, University of Alberta)

P-37 The effect of language mindsets on language anxiety among international students.

Ashley Huang, Clarisse Sheane, Brian Park, Almutaserbella Sawalha, Taylor Irvine, Nigel Mantou Lou, Kimberly Noels

P-38 An Exploration of the Perceived Femininity of Language Learning.

Pranav Bali, Millie Mohan, Kathryn Chaffee, Kimberly Noels, & Lauren Elcheson (Department of Psychology, University of Alberta)

P-39 The development of point-following in infancy: a longitudinal and naturalistic study.

R. Veinott-McKeough, P. Barbosa, & E. Nicoladis (Psychology Department, University of Alberta)

P-40 The association between physical activity, sedentary time and response inhibition in early childhood.

Abdul Rahman, A., Pertschy, D., Carson, V. & Wiebe, S.A. (University of Alberta).

P-41 Teacher-Child Relationship Quality and Behaviour Regulation in Preschool.

D. Hui & W. L. G. Hoglund (University of Alberta)

P-42 Parent-child shared book reading and the development of children's executive function.

M. N. Pinkoski, B. M. Galal, S. Dhalla & S. A. Wiebe (University of Alberta)

P-43 Parental influences on executive functions in early childhood: Differential effects of maternal responsiveness and harshness.

Vrantsidis, D. M. (University of Alberta), Clark, C. A. C. (University of Arizona), Chevalier, N. (University of Edinburgh), Espy, K. A. (University of Arizona), & Wiebe, S. A. (University of Alberta)

Invited Internal Speaker

The Aesthetic Effects of Literary Reading and Impactful Dreams: Sublime Disquietude and Sublime Enthrallment.

Don Kuiken (University of Alberta)

Conceptions of sublime feeling have begun to find a place in empirical aesthetics. Priority sometimes is given to objects with sublime qualities (e.g., the grandeur of nature) (Konecni, 2011) and sometimes to emotions with sublime magnitude (e.g., wonder and amazement) (Zentner, Grandjean, & Scherer, 2008). According to a more traditional (Kantian) conception, sublime feeling involves: (1) recognition of limited conceptual access to an elusive, incongruous, or overwhelming object; (2) simultaneous awareness of a preconceptual grasp of that object; and (3) simultaneous awareness of the mode of expressive engagement through which that object has become partially disclosed. Sublime feeling occurs in two forms, one involving a discordant mode of expressive engagement (sublime disquietude) and another a reverent mode of expressive engagement (sublime enthrallment). Previous research indicates that sublime disquietude emerges while reading painful poetry (e.g., Celan's Death Fugue, while sublime enthrallment emerges while reading astounding poetry (e.g., Shelley's Mont Blanc) (Kuiken, Campbell, & Sopčák, 2012). Also, sublime disquietude emerges during existential dreams (involving ineffectuality and loss), while sublime enthrallment emerges during transcendent dreams (involving flying/floating and magical accomplishment) (Kuiken, 2015). Review of these studies will be followed by discussion of sublime feeling as disportation (Burke, 2015), with particular reference to: (1) pre-enactive (rather than re-enactive) simulation (Willems, Toni, Hagoort, & Casasanto, 2009); (2) metaphorically emergent (rather than metaphorically mapped) meanings (Estes & Ward, 2002; Terai & Goldstone, 2012); and (3) being moved to understanding (rather than emotionally) (Lüdtke, Meyer-Sickendieck, & Jacobs, 2014; Menninghaus, Wagner, Hanich, Wassiliwizky, Kuehnast, & Jacobsen, 2015).

Oral Presentations

Session 1: 9:30am - 10:30am

1. Do gestures serve an interpersonal function?

Yiwei Chen and Elena Nicoladis (Psychology Department, University of Alberta)

People sometimes gesture, move their hands in meaningful ways, while speaking (McNeill, 2000). Why? One possible reason is to make their meaning clear to the listener. If so, then people who are less sensitive to the conversational needs of others might gesture less than those who are more sensitive. To test this possibility, we measured the degree of autism in adult males. Deficits in social abilities are the core of Autism Spectrum Disorder, which affects males more than females (Lord, Rutter, Le Couteur, 1994). We hypothesize that males who score high on the Autism Spectrum Quotient gesture less frequently. To test our hypothesis, we asked participants to complete the Autism Spectrum Quotient (AQ) questionnaire (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). To elicit gestures, participants talked about a cartoon they watched and responded to questions about scientific (e.g. How does lightning work?) and social concepts (e.g. How do you make a friend?). To account for individual differences in how much they talked, we calculated the participants' gesture rate as the number of gestures divided by the number of words spoken. The initial results demonstrate a weak correlation between AQ scores and gesture rate for both cartoon and explanation tasks. In other words, the frequency of gesturing is not related to the participants' degree of autism. These results do not support the argument that gestures serve an important role in interpersonal communication. We argue that gestures may be more related to an individual's construction of the message he/she wishes to convey.

2. Are executive functions involved in the processing of opaque compound words? A study of individual differences.

Juana Park, Faria Sana, Christina Gagné & Thomas Spalding (Department of Psychology, University of Alberta)

Compound words (e.g., blueberry) are words that are composed of two morphemes or constituents. Compound words vary in the degree to

which each constituent (e.g., blue and berry) contributes to the meaning of the whole word. They range from fully transparent if the meaning of the word can be extracted directly from the meaning of its constituents (e.g., snowball), to fully opaque if the meaning of the word is completely unrelated to the meaning of its constituents (e.g., hogwash). Previous studies have shown that people process these two types of compounds differently. Given that opaque compounds, contrary to transparent compounds, require the inhibition of the irrelevant meanings of their constituents, we hypothesized that their comprehension would recruit executive functions. We analyzed whether participants' scores on an executive function task predicted the ease of processing opaque compound words. More specifically, we examined whether the performance on the Eriksen flanker task, which requires the suppression of irrelevant stimuli, was related to the performance on a lexical decision task that included both types of compound words.

3. Same Storyteller, Two Languages, Different Stories: A Comparison of Bilingual Children's Chinese and English Narratives.

J. B. K. Koh, E. Nicoladis, & P. Marentette (University of Alberta)

Cultural values are attached to and reflected in language, which influences the ways that one perceives and thinks about the world and the stories being told about it. This study examined the influences of culture and language on the organization, content and style of thinking in bilingual children's Chinese and English narratives. Participants were Chinese-English bilingual children aged 4-6 years. The children were sequential bilinguals, who spoke Chinese first. Each child was interviewed twice, once in each language. During the interviews, children watched a Pink Panther cartoon and retold the story. Findings revealed that a greater proportion of children told the story in Chinese than in English. Compared to stories told in English, stories told in Chinese were lengthier, showed more temporal markers, more referential and evaluative information, more actions by the secondary character, more shared actions by the main and secondary characters, more internal states of characters, and more of an integrated style of thinking that focuses on connectedness. Furthermore, a greater proportion of children showed usage of authoritarian speech when telling the story in Chinese than in English. In contrast, compared to stories told in Chinese, stories told in English showed more connectives, a greater proportion of orientation information, a greater proportion of actions by the main character and a greater proportion of a differentiated style of thinking that focuses on distinctiveness. These findings suggest that bilingual children's narratives told in the respective languages are mediated by culture and language.

4. A Model for Predicting Emergent Meaning during Literary Reading.

Shawn Douglas, (Psychology Department, University of Alberta) Don Kuiken, (Psychology Department, University of Alberta)

Expressive reading supports affective theme articulation and prompts self-perceptual shifts (Sikora, Kuiken & Miall, 2011). We propose (1) that expressive reading begins with the destabilization of meaning in response to stylistically enriched (e.g., metaphoric) textual material; (2) such a response to stylistically enriched material evokes a felt sense that something has emerged that cannot be expressed (an inexpressible realization); and (3) that this felt sense of emergent meaning elicits reflective explication, a process that gradually expresses previously inexpressible thoughts (emergent meaning). Two studies utilizing SEM analyses provide evidence for differential prediction of the emergent meaning of metaphoric sentences during two forms of literary reading: expressive enactment and integrative comprehension. Following expressive enactment, readers were more likely to rate the vehicle and topic terms of unconventional metaphors (Death is a fat fly) as in the same class (Study 1 and 2). Following integrative comprehension, however, readers were more likely to rate the vehicle and topic terms of conventional metaphors (Genes are blueprints) as in the same class (Study 1 only). Expressive reading may facilitate the emergence of meaning in novel but apt metaphoric expressions.

Session 2: 11:00am - 12:00pm

1. Living in History and Culture: How Public Events, Personal Transitions, and Culture Affect the Organization of Autobiographical Memory in Chinese Older Adults.

Xuan Gu, Norman R. Brown (Department of Psychology, University of Alberta), and Chi-Shing Tse (Department of Educational Psychology, The Chinese University of Hong Kong)

The Living-in-History effect occurs when people use public events as temporal references to support their date estimation of autobiographical memory. Though the effect has been examined in cross-cultural samples, little is known about its effect on the organization of autobiographical memory in Chinese. Our study is aimed to examine the roles of public events, personal transitions, and Chinese culture in the organization of

Chinese older adult's autobiographical memory. Using the two-phase Living-in-History paradigm (Brown et al., 2009), we interviewed fifty-one older adults in Beijing. The participants' responses reflected the Historically Defined Autobiographical Periods (H-DAPs): they tended to organize their autobiographical memories around public events like Cultural Revolution (11% of all memories). Participants who were rusticated because of Cultural Revolution more frequently used H-DAPs as temporal landmarks, relative to those who were not rusticated [4.00(2.72) vs. 1.05(1.25), $p < .01$]. The rusticated participants also rated greater materially (but not psychologically) transitional impact of the public event than their counterparts. Moreover, both personal transitions (e.g., moving house, job change) and life-scripted events registered in Chinese cultural life script (e.g., marriage, first job) were frequently used to date memories. Chinese older adults preferred to date their personal memories in relation to others' (mostly their family members') life-scripted events, transitional events, and developmental status. These findings suggested that (a) personal and collective transitions, which changed ones' fabric of daily life, structure individuals' autobiographical memories and (b) culture defines the normative transitions and the degree of including others into one's autobiographical memories within that culture.

2. The effect of immigration on the contents and organization of autobiographical memory.

Liangzi Shi (Psychology Department, University of Alberta) Felicia Nordlund (Psychology Department, University of Alberta) Norman R. Brown (Psychology Department, University of Alberta)

Three groups of middle-aged immigrants (Nigerians, British, Chinese) and one group of migrants participated in this study. All were at least in their 30's when they arrived in Alberta. Participants generated autobiographical memories in response to neutral cue words and then thought aloud as they estimated a date for each. Consistent with prior research, relocation produced a marked immigration bump in all samples. As predicted, participants also frequently mentioned relocation during the dating task, and thus provided evidence for its organizational importance. Finally, Transitional-Impact-Scale data collected from the Chinese sample confirmed that immigration is understood as a major life transition.

3. Cultural Differences in Spontaneous Trait and Situation Inferences.

*H. Lee & T. Masuda (Psychology Department, University of Alberta)
Yuki Shimizu (Education Department, Saitama University) James S.
Uleman (Psychology Department, New York University)*

Previous findings indicated that when people observe someone's behavior, they spontaneously infer the traits and situations that cause the target person's behavior. These inference processes are called spontaneous trait inferences (STIs) and spontaneous situation inferences (SSIs). While both patterns of inferences have been observed universally, little research has comprehensively examined to what extent people from different cultural backgrounds endorse these inferences when both the trait and situation information are presented. Based on the previous literature on research in culture and attention, we hypothesized that European Canadians would be more likely to endorse STIs than SSIs because of the analytic thinking style dominant in North America, whereas Japanese would equally endorse both STIs and SSIs because of the holistic thinking style dominant in East Asia. Employing the savings-in-relearning paradigm, we presented pieces of information that induce STIs and SSIs respectively, and examined cultural differences in the amount of endorsement of both inferences. The results in general supported our hypotheses. The relationships between culturally dominant modes of attention and the inference processes are discussed.

4. Gifted children: When numbers do not tell the whole story.

G. K. Georgiou, K. Dunn, & J. P. Das (Department of Educational Psychology, University of Alberta)

It is generally accepted that giftedness is one of the most neglected components of special education. In this study, we examined how many of the children currently attending gifted programs in Edmonton and area are truly gifted, using various definitions of giftedness. Results showed that only 15 of the 92 children participating in our study had an IQ score higher than 130 (based on WASI; Wechsler, 1999) and only five of them also had an IQ score higher than 130 on Cognitive Assessment System (Naglieri & Das, 1997). Twenty-five children had a standard score higher than 130 on Broad Reading (assessed with Woodcock-Johnson III), but this score was primarily driven by their high performance in silent reading fluency than on word identification or passage comprehension. Six children were gifted on mathematics (assessed with Woodcock-Johnson III), but only three of

them were also gifted in reading. Taken together, our results suggest that only a sub-group of children currently attending gifted programs were truly gifted (using either conceptualization of giftedness) and there was only minimal overlap between the different groups of gifted children, even when the selection criterion presumably tapped the same underlying cognitive ability. These findings further highlight the need to have better screening procedures in place for the accurate identification of gifted children.

Session 3: 2:30 - 3:15pm

1. Inhibition of protein synthesis in the rat amygdala by anisomycin causes memory deficits at short- and long-term time points.

L. A. Rimstad (Neuroscience and Mental Health Institute, University of Alberta), D. Treit (Psychology Department, University of Alberta), & C. T. Dickson (Psychology Department, Physiology Department, Neuroscience and Mental Health Institute, University of Alberta)

The process by which an experience is transferred from a labile state into a stable long-term memory, referred to as consolidation, has been suggested to rely on the production of new proteins within the brain. This de novo protein synthesis hypothesis has been largely supported by research showing that the use of protein synthesis inhibitors (PSIs) can produce long-term, but not short-term, memory deficits in experimental animals. However, a recent study from our group has shown that intra-hippocampal administration of PSIs severely depresses, and sometimes eliminates, electrical activity. Follow-up studies have demonstrated that intrahippocampal infusions of the PSI anisomycin (ANI) can disrupt online (moment-to-moment) behaviour in the elevated plus maze, as well as the allocentric version of the Morris water maze. In the current study ANI was infused into the basolateral amygdala of adult rats before training on an auditory fear conditioning task and memory was subsequently assessed. We show here that intraamygdalar ANI disrupts both short- and long-term fear memory to the same extent as the neural inactivator TTX. This provides further support for the 'inactivation' hypothesis of protein synthesis inhibition which posits that ongoing protein production is necessary to maintain normal neurobiological function.

2. Personality and cerebral lateralization.

B. G. Cioceanu & P. L. Hurd (Psychology Department, University of Alberta).

Whether an individual tends to engage in proactive or reactive stress coping styles is the primary dimension of personality variation in non-human animals. This aspect of personality remains relatively understudied in humans. More strongly lateralized individuals have been hypothesized to make faster, more error-prone decisions and act in a more impulsive, proactive style. Previous work in our laboratory has demonstrated a link between cerebral lateralization and personality in fish. Here, I investigate the relationship between stress coping style and cerebral lateralization in humans. I find that more strongly lateralized individuals are more likely to engage in proactive coping, whereas no effect of lateralization was seen on reactive coping.

3. Red Light, Green Light: Understanding the Perceptual Qualities of Alpha Inhibition and the Role of Attention in Entrainment.

Jonathan W. P. Kuziek (Department of Psychology, University of Alberta) & Kyle E. Mathewson (Department of Psychology, University of Alberta; Neuroscience and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta)

Alpha oscillations, rhythmic neural activity fluctuating 8-12 times per second (Hz), modulates awareness and inhibits detection of visual stimuli. This inhibitory process is dependent on both high amounts of alpha activity and the precise moment a visual stimulus occurs during the alpha cycle. These alpha oscillations can be induced using an entrainment technique whereby visual stimuli are rapidly presented at 8-12 Hz, causing alpha to oscillate in a similar rhythm. Targets then presented in-time with entrainment are better detected than those out-of-time. It is unclear how attention influences entrainment, and if the resulting alpha inhibition is an all-or-none process. The goal of the current research is two-fold. We want to understand the role of attention in entrainment of neural activity, specifically, can entrainment be isolated to a single set of distinct, attended stimuli when multiple, competing entrainers are presented out-of-phase at the same location. We also wish to further understand alpha inhibition: are visual stimuli presented during specific phases of the alpha cycle completely inhibited or are some characteristics able to be perceived

and acted upon? Data suggests entrainment can be actively manipulated by attending to certain stimuli while ignoring others; participants tend to be entrained by attended stimuli and not by the competing stimuli or the combined rhythm of all presented stimuli. Following entrainment, the colour of stimuli presented out-of-time is less accurately, but more consistently, reported than in-time stimuli. These results suggest that some limited visual information is able to be perceived, and acted upon, during alpha inhibition.

Symposium: Left Turns in Research

1:15pm - 2:30pm

1. Introduction.

J. B. Caplan (Psychology Department, University of Alberta).

2. Obstacles when studying obstacles: Interactions between attention and action impact emotional evaluations.

N. J. Wispinski (Psychology Department, University of Alberta), J. T. Enns (Psychology Department, University of British Columbia), A. Singhal (Psychology Department, University of Alberta), & C. S. Chapman (Faculty of Physical Education and Recreation, University of Alberta)

How we attend to visual images and objects has a significant impact on emotional associations. Past research has identified a distractor devaluation effect, whereby ignored images are evaluated more negatively than actively attended images (Raymond & Fenske, 2006). With the goal of extending these findings to an attentional landscape framework, where goal-relevant and goal-irrelevant objects in space are attentionally amplified or suppressed respectively, we aimed to investigate emotion and attention toward obstacles. Previous work has shown that obstacles impeding action must be attentionally suppressed in order to be successfully avoided. With the reasoning that greater attentional suppression of to-be-avoided obstacles would lead to greater devaluation, we asked participants to attend and ignore objects in a complex environment instead of on a computer screen. However, our results presented a complete U-turn, and instead of devaluation, we found target appreciation. That is, attend

ed targets were rated more positively than other stimuli. Subsequent experiments revealed that, when selecting the same target objects with a keyboard instead of moving to grasp them, participants show neither distractor devaluation nor target appreciation. Taken together, these data uncover a much more complex relationship between attention, action, and emotion than previously thought. When the distractor devaluation effect is taken outside of the lab to a three-dimensional environment, the effect disappears. Additionally, when asked to act and interact within an environment, the effect is reversed. In short, how attention influences emotional associations depends critically on the environment, and action affordances within it.

3. Left turn now, right turn later: Studying cognitive processes across species using the midsession reversal procedure.

N. McMillan (Psychology Department, University of Alberta)

It has been shown previously that some animals make surprising anticipatory errors on choice tasks in which contingencies of reinforcement reverse midway through each session. Over five years and three laboratory groups I have determined that many species make these errors, that they are based on interval timing (i.e., that subjects determine how long from the start of the session the reversal will occur), and that these errors reflect a weighted give-and-take between animals' timing systems and other behaviour and decision-making systems. In this talk I will describe the path of serendipity, methodological compromises, and exploration of weird findings that together led us to better understand how animals (including humans) process and anticipate predictable changes in the environment.

4. So, uh, maybe Albertan toddlers are just stupider than Georgian toddlers?

Elena Nicoladis (Psychology Department, University of Alberta)

Many previous studies have shown that young children can learn gestures to refer to objects, even before they can say any recognizable words. Some research has even suggested that exposure to gestures can lead to an early (if short-lived) spurt in vocabulary acquisition. One possible explanation of these results is that gestures can be iconic (i.e., look like the referent; like flapping one's hands at one's sides to mean bird), giving children a baby step into symbolic acquisition. However, studies from Georgia have shown that 18-month olds are equally capable of learning iconic and arbitrary gestures while 26-month olds show an advantage for iconic

gestures. In Study 1, we tested the hypothesis that toddlers would become increasingly sensitive to iconicity between 18 and 26 months. What we found was that we were completely unable to teach toddlers any gestures at all. One possible interpretation of these results is that Albertan toddlers are simply stupider than Georgian toddler. Deciding it was far more likely that our methods had failed to elicit adequate learning, we did another study in which we used the very same methodology to teach toddlers novel words. In Study 2, we succeeded in teaching children novel words using the exact same methodology as we had in Study 1, results inconsistent with the interpretations that Albertan toddlers are simply stupider and that our methods would not elicit learning. So, why could we not teach toddlers any gestures in Study 1? I'll tell you on March 11.

Keynote Address

Cognitive Neuroscience of Human Visual Attention and Working Memory.

Brad Postle (University of Wisconsin)

Working memory is of central importance for high-level cognition in the primate. My lab takes a brute-force approach to studying 'how working memory works' -- with brain imaging and brain stimulation methods -- and we have found ourselves moving increasingly upstream, away from the prefrontal cortex and toward the thalamocortical circuitry that underlies visual perception. We're working with the idea that visuospatial attention and, therefore, working memory, may be accomplished via the hijacking of the oscillatory dynamics that are fundamental to mammalian sensory systems.

Poster Presentations

P-01 Behavioural states consistent with deactivated hippocampal activity favour better subsequent memory performance.

B. E. Hauer (Neuroscience and Mental Health Institute, University of Alberta), L. A. Rimstad (Neuroscience and Mental Health Institute, University of Alberta), & C. T. Dickson (Neuroscience and Mental Health Institute, University of Alberta; Department

Offline activity, such as during sleep, has been suggested to aid in the consolidation of hippocampal-dependent memories. Two electrophysiological patterns suggested to be important for this effect are the slow oscillation (SO; ~1Hz rhythm occurring during slow-wave sleep) and ripples (fast oscillations occurring during awake immobility and non-REM sleep). This offline activity following learning presents an opportunity for widespread cortico-hippocampal coordination via SO, or for neuronal rehearsal of the previous learning episode via ripples. In an attempt to disentangle the role of slow oscillations versus ripples, as well as wake versus sleep, we utilised a procedure of behavioural state clamping given the well-known dissociation of hippocampal state across specific behaviours. Following learning in a single-trial water maze paradigm, rats were allowed to sleep (SO-rich state), or encouraged to groom by fur wetting (ripple-rich state), or to run in a wheel (theta-rich state) during a one hour intervening period. Immediately after this interval, spatial memory performance was assessed. We compared the rate of memory acquisition across conditions, and the extent to which memory for the arrangement of spatial cues in the behavioural task was maintained. We show that post-learning behavioural states promoting deactivated hippocampal activity (ripples and SO) improve subsequent spatial memory performance.

P-02 Vision-related quality of life of patients with hemianopia.

S. S. Sheldon & R. L. Woods (Schepens Eye Research Institute, Massachusetts Eye and Ear & Harvard Medical School, Boston, MA).

Homonymous hemianopia (HH), the loss of vision on one side in both eyes, is a frequent consequence of post-chiasmal lesions from conditions such as stroke, tumors and trauma. People with HH often report difficulties with mobility and reading, but there is little information about which vision-related abilities people with HH report as most difficult. To investigate this issue, Rasch analysis was performed on data from 247 people with HH collected in five studies conducted in four countries using three Quality of Life questionnaires. Our results were then compared to published studies on people with other types of vision impairment to look at differences in their reported vision-related difficulties. People with HH reported greatest difficulty with driving. They also reported adverse mental and emotional effects due to their vision loss such as being limited in their activities, feeling like they accomplish less, and getting frustrated a lot

time because of their vision. When compared to a previous study on central vision loss and peripheral vision loss, our HH sample reported greater adverse mental and emotional effects due to their vision loss. Furthermore, our HH sample reported more difficulty with avoiding obstacles and walking around than a population with glaucoma and retinal pigmentosa. The tendency for people with HH to report more adverse mental and emotional effects due to their vision loss has not been noted previously. We hypothesize these differences may result from the suddenness of the visual loss in HH as compared to the gradual degradation of vision over the course of years in most other types of vision loss.

P-03 The Effects of Transcranial Direct Current Stimulation (tDCS) on a Discrete Naming Task in Healthy Adults.

Alesha J Reed BSc, (Communication Sciences and Disorders, University of Alberta), Shivraj S. Jhala, PhD (Communication Sciences and Disorders, University of Alberta), Carol A Boliek, PhD (Communication Sciences and Disorders & Neuroscience and Mental Health Institute, University of Alberta) and Jacqueline Cummine, PhD (Communication Sciences and Disorders & Neuroscience and Mental Health Institute, University of Alberta)

Background: Transcranial direct current stimulation (tDCS) is a non-invasive form of neurostimulation wherein a low level of current is applied over a targeted area of the cortex. Previous research has demonstrated that anodal (e.g., excitatory) stimulation over the left dorsolateral prefrontal cortex (DLPFC) can enhance performance on overt speaking tasks and positively impacts intermuscular coherence (IMC). The effects of tDCS over the DLPFC on distal (IMC) and proximal (reaction time (RT)) measurements of speech production during articulation have not yet been evaluated. Methods: Thirty young adults (ages 18-45 yrs; 10 per stimulus type) participated. Participants performed a baseline discrete naming task. Four sets of letter strings included regular words, nonwords, exception words, and pseudohomophones. Anodal (excitatory), cathodal (inhibitory), or sham stimulation was applied at 1 mA to the left DLPFC for 13 minutes. Following stimulation, participants repeated the discrete naming task with a second set of matched stimuli. Reaction times and intermuscular coherence from the muscles of the chest wall and the perioral muscles were collected. Results: In the anodal condition, IMC increased during regular words, and reaction time increased for exception words following stimulation. In the cathodal condition, IMC decreased following stimulation and no changes were found on response time. Conclusions: Distal (IMC) measurements of speech production during articulation appear to be more

sensitive to the effects of tDCS. These results expand our knowledge of the effects of tDCS over the DLPFC on proximal (RT) and distal (IMC) measurements for articulation. In addition, this work advances our understanding of a global print-to-speech network.

P-04 Comparison of Note Compositions Between Sexes of Black Capped Chickadees.

H.F Warren, K.A Campbell, C.B. Sturdy (Psychology Department, University of Alberta)

Black-capped chickadees (*Poecile atricapillus*) are songbirds found throughout most of North America. They produce a distinctive chick-a-dee call that is known to communicate information regarding species, geography, and individual identity. Other vocalizations in the black-capped chickadee repertoire have been shown to differ between the sexes (tseet call, fee-bee song); however, sex differences have not been described in chick-a-dee calls. Different levels of immediate early gene expression in black-capped chickadee auditory brain regions have been shown in response to chick-a-dee calls produced by males and females. To investigate potential sources of these differences in neural expression, we analyzed differences in note compositions of chick-a-dee calls of male and female black-capped chickadees. Chick-a-dee calls from wild-caught black-capped chickadees were analyzed to compare note compositions between the sexes. From research in related species, we predicted that males would produce more notes per call, and more of each note type per call than females. Preliminary data supported this prediction. Understanding the composition of chick-a-dee calls will add to our knowledge of the mechanisms of vocal communication of black-capped chickadees and could be more broadly applied to the learning processes of other species with acquired vocalizations, including humans.

P-05 The effects of conspecific and heterospecific vocalizations on ZENK expression in the zebra finch (*Taeniopygia guttata*) auditory forebrain.

T. Intaprasert (Biological Science, University of Alberta), E.N. Scully, A.H. Hahn, K.A. Campbell, N. McMillan, J.V. Congdon, and C.B. Sturdy (Psychology Department, University of Alberta)

Songbirds use vocalizations for many biologically important functions including territorial defense, flock maintenance, and mate attraction. In zebra finches (*Taeniopygia guttata*), males produce both songs and calls

while females produce only calls that are longer in duration than males. This is in contrast to black-capped chickadees (*Poecile atricapillus*) where both males and females produce songs and calls. Avey et al. (2014) presented con- and heterospecific calls to black-capped chickadees and measured the amount of ZENK expression, an immediate early gene, in the nidopallium. They found no significant difference in neural activity as a function of phylogenetic relatedness. Thus, we conducted a similar experiment to test if there is a sensitivity to acoustic signals over differences in phylogenetic relatedness with zebra finches. We looked at the same areas of the zebra finch forebrain as examined by Avey et al.: the caudo-medial mesopallium, and the ventral and dorsal area of the caudomedial nidopallium. By quantifying the amount of ZENK expression in the auditory forebrain after con- and heterospecific playback, we were able to observe different levels of neuronal activation depending on caller identity and types of vocalization. Similar to the previous work with chickadees, our preliminary results suggest that there was no difference in neural activity among calls from different species. However, we predict that there will be differences within and between groups of calls when comparing sexes in future analyses.

P-06 Taking off the training wheels: Measuring auditory P300 during outdoor cycling using an active wet EEG system.

K. A. Townsend, D. L. Cormier, J. E. M. Scanlon, J. W. P. Kuziek, K. E. Mathewson (Department of Psychology, Faculty of Science, University of Alberta; Neuroscience and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta)

An important limitation for cognitive neuroscience to overcome is the challenge of studying brain activity in mobile and complex environments. Currently, there is limited amounts of research demonstrating accurate and statistically reliable ERP data collected from outdoor cycling. In this study, the EEG equipment was adapted for use and transportation in a backpack while cycling. Participants performed an auditory oddball task while sitting in an isolated chamber inside the laboratory as well as cycling outdoors. In the 'outside' condition, participants were instructed to pedal slowly, at a sub-aerobic level. In both conditions, the participant's task was to press a mock-press buttons with the index finger of their right hand when the rare tone was heard. A Raspberry Pi model B computer was used both to create stimuli and mark the data for ERP averaging. The data from 16 active wet Ag/AgCl pin electrodes, arranged in 10-20 positions, was recorded on a Microsoft Surface computer. Cycling diminished alpha amplitude and increased EEG noise. Significantly decreased P2 amplitude

was observed when evoked by both standards and targets during cycling outside. This may be due to attentional processes filtering the overlapping sounds between the tones used and similar environmental frequencies. This study established methods for mobile recording of ERP signals. Future directions include investigating P2 filtering inside the laboratory.

P-07 Neurophysiological mechanisms of the effect of aging on context use in sentence comprehension.

Shrida S. Sahadevan, Esther S. Kim, Jacqueline Cummine (Faculty of Rehabilitation Medicine & Department of Communication Sciences and Disorders, University of Alberta)

Sentence comprehension is fairly resistant to age-related cognitive decline; however, event-related potentials (ERPs) studies have shown age effects in neural activity associated with sentence comprehension, specifically when contextual information is manipulated. One well-documented ERP component, N400, may reflect the use of context to predict upcoming words. Older adults have smaller and later N400 responses than younger adults for unexpected sentence-endings (Federmeier et al., 2002), suggesting age-related differences in how adults use context. In our study, younger (age 18-30) and older (age 50 and above) adults read pairs of sentences. The first sentence established the context. The second sentence ended with the target word, which was either expected, unexpected but semantically related, or unexpected and unrelated to the context). Younger and older adults demonstrated maximal N400 responses for unexpected-unrelated words and minimal N400 responses for expected words, but the amplitude and latency of these responses differed between age groups. Younger adults also demonstrated maximal post-N400 positivity (PNP) for expected words at frontal locations and maximal PNP for unexpected-unrelated words at parietal locations, which may reflect attempted semantic reanalysis of incongruent sentences. Overall, our findings are important for understanding the neural correlates underlying age effects on sentence comprehension and for contributing to current models of language processing.

P-08 Diffusion Kurtosis Imaging in Persistent Developmental Stuttering.

Ehsan Misaghi (Neuroscience and Mental Health Institute (NMHI), Faculty of Medicine and Dentistry, University of Alberta; Institute for Stuttering Treatment and

Research (ISTAR), Faculty of Rehabilitation Medicine, University of Alberta), Jacqueline Cummine (Neuroscience and Mental Health Institute (NMHI), Faculty of Medicine and Dentistry, University of Alberta; Department of Communication Sciences and Disorders, Faculty of Rehabilitation Medicine, University of Alberta), Deryk S. Beal (Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital; Department of Speech-Language Pathology, Faculty of Medicine, University of Toronto)

Persistent developmental stuttering is a subtype of stuttering that emerges in children 18 to 60 months of age. The phenotype is characterized with speech sound repetitions and prolongations as well as silent blocks. Stuttering affects about 5% of children and 1% of the general population. Previous research on stuttering has shown some differences in the brains of people who stutter (both in children and in adults), but there are a lot of inconsistencies, mostly because of the limitations of the methods employed. Diffusion tensor imaging (DTI) is a great tool to visualize and assess the structural connections of the brain, but unfortunately, does not consider the non-Gaussianity of the molecular motion, a limitation that can be overcome using Diffusion kurtosis imaging, a new diffusion imaging method that can also resolve the issue of crossing fibers. This project aims to understand the anomalies in the brain connections of adults who stutter (AWS) using diffusion kurtosis imaging in a subset of five AWS and 5 matched controls. We hypothesize that (a) stuttering is associated with loss of neuronal integrity in the Broca's area, meaning that we expect to see lower mean kurtosis values in that area in AWS relative to controls and (b) the previously observed lower fractional anisotropy values in the left arcuate fasciculus of people who stutter may be indicative of a failure in myelination of the neurons in that area, meaning that we expect to observe a lower radial kurtosis there.

P-09 Oxygenating the brain: Examination of spontaneous EEG activity across normoxia and hyperoxia.

Wesley Vuong (Department of Psychology at the University of Alberta Clayton T. Dickson (Department of Psychology, Department of Physiology, & Neuroscience and Mental Health Institute at the University of Alberta) Kyle E. Mathewson (Department of Psychology & Neuroscience and Mental Health Institute at the University of Alberta) sad

Oxygen is an essential molecule to sustain brain function. In normal conditions (normoxia), the oxygen content in air is 21%. While concentrations below this (hypoxia) are bad for brain function, currently it is not well understood what influence concentrations above this (hyperoxia) might have

on the brain. Given the claims associated with the recreational uses of hyperoxia in so-called oxygen bars, this lack of information is worrisome. Our lab has demonstrated that hyperoxia can promote deactivated (slow-wave) states of brain activity in both anaesthetized and naturally sleeping rats. Currently, we are studying the hyperoxic effects on resting states in awake human subjects by examining spontaneous EEG activity across normoxia and hyperoxic situations within-subjects for both eyes open and eyes closed conditions. We also measured respiration rate, heart rate, and blood oxygen saturation levels (SpO₂). Based on past research, we hypothesized that increased levels of oxygen in the blood will increase the amount of alpha power during hyperoxia in both eyes open and closed conditions. However, we observed no reliable changes in alpha power with increased levels of blood oxygen caused by hyperoxic inhalation. These results suggest that the modulatory effects of oxygen may be state or even frequency specific and we will be examining the effects of oxygen under napping conditions.

P-10 Effects of Mask Duration on the Priming of Pseudo-compounds.

Whitney Fox, Jasmine Burry, Tori Robinson, Christina L. Gagné, & Thomas L. Spalding (Department of Psychology, University of Alberta)

Compound words (e.g., blueberry = blue + berry) are often categorized based on their semantic transparency: how much each constituent contributes to the overall meaning. Pseudo-compounds appear to have compound structure but are monomorphemic (e.g., season \neq sea + son). Research on compounds frequently uses a masked prime paradigm, and has found that exposure to a compound word facilitates processing of a constituent within that compound. For example, seeing blueberry before seeing blue speeds up lexical decision processing times. Pseudo-compounds show a negative priming effect, where exposure to the pseudo-compound (e.g. season) before a pseudo-constituent (e.g., sea) slows down processing. Researchers have not considered the impact of the mask duration within the paradigm on processing speeds of pseudo-compounds. Our study looks at whether the duration of the mask between the pseudo-compound and the pseudo-constituent affects processing by comparing two experiments with differences in the mask duration. Our findings demonstrate significant negative priming at both long and short mask durations. Mask duration did not affect the degree of negative priming. This finding strengthens the evidence that pseudo-compounds' pseudo-morphemic

structure conflicts with its actual monomorphemic structure, leading to processing difficulties rather than facilitation as observed in compounds.

P-11 The effect of serial vs. isolated processing on good and poor readers' naming performance.

A. Altani, M. Boonstra, & G. K. Georgiou (Department of Educational Psychology, University of Alberta)

The ability to name a set of familiar items, such as digits or objects, has been shown to predict individual differences in rapid processing of words during reading (Kirby, Georgiou, Martinussen, & Parrila, 2010). Behavioral evidence suggests that when the items are presented in an array, typical readers are faster than when the same items are presented one-by-one on the screen (Protopapas, Altani, & Georgiou, 2013). In contrast, it has been found that multiple-item presentation yields larger deficits in children with reading difficulties (Zoccolotti et al., 2013). The present study compared the performance of poor ($n=30$) and good ($n=82$) Grade 3 readers when naming different stimuli (digits, words, and objects) presented simultaneously or in isolation. Group comparisons and covariance of performance among all measures revealed that the main difference between the groups was in naming serial displays of digits and words; whereas, their performance in naming all items in isolation was similar. Limited automatization in object naming may account for similar performance between the groups in both serial and isolated object naming. We argue that the ability to process highly automatized items (digits, words) in serial fashion is the bottleneck in reading difficulties.

P-12 Memory for order of items within word-pairs: the effects of simple strategies.

Tomi Ann Limcangco, Kenichi Kato, and Jeremy B. Caplan (Psychology Department, University of Alberta)

Little is known about episodic memory for the order of items within associations (James-Dean or Dean-James?), but such data can provide important constraints on mathematical models of association-memory. Convergent evidence suggests that without strategy instructions, human participants have some ability to learn associations along with order, but not perfectly. We tested whether strategies that are easily instructed might improve participants' within-pair order-memory, as tested with order-rec

ognition, where participants discriminate intact (AB) from reversed (BA) probes. After obtaining a baseline measure of order-recognition ability, participants were explicitly instructed to apply either interactive imagery or the peg-list method, and compared to a control group, who continued without strategy instructions. Peg-list participants were first taught a 10-item list of peg words linked to the number system (1-BUN, 2-SHOE, etc.) and then were asked to link each new item to its corresponding peg word. The interactive imagery group performed significantly better than both other groups. The peg-list group performed worse than their baseline performance; however, when participants succeeded in learning peg-item associations (tested with an independent peg-memory test), order-memory was quite high. Speed of learning of the peg list also facilitated order-memory. Interactive imagery is well known to be one of the most effective strategies for association-memory. Our results showed that interactive imagery was also most effective for order-recognition. However, the peg-list strategy might benefit from more time for participants to form peg-item images. In sum, with simple strategy instructions and virtually no training, participants can improve their order-memory accuracy.

P-13 Do cues make a difference in perception? An investigation of humans' ability to differentiate arousal levels of animal vocalizations.

N. K-H. Yang, J. V. Congdon, J. Hoang (Psychology Department, University of Alberta), P. Filippi (Artificial Intelligence Laboratory, Vrije Universiteit Brussel; Center for Mind, Brain and Cognitive Evolution, Ruhr University Bochum), D. L. Bowling, S. A. Reber, A. Pašukonis (Department of Cognitive Biology, University of Vienna), & C. B. Sturdy (Psychology Department, University of Alberta)

The ability to discriminate arousal levels of animal vocalizations is one of the most important evolutionary functions for an organism's survival. Signals regarding arousal level may illustrate a threat to the life of an organism, a homeostatic imbalance, or a general increase in motivation or attention. With addition of a prime (i.e., a visual, auditory, or chemosensory stimulus) a person's judgements can be impacted by an increase of sensitivity to a particular stimulus. We presented human participants with nine species' vocalizations from high and low arousal contexts. We examined whether an explicit cue would act as a prime and aid participants in determining how to categorize and generalize animal vocalizations more quickly and accurately based on arousal levels. Regardless of prime, our preliminary results suggest that humans are capable of discriminating vocal signals across species based on arousal level, despite gender, age, and experi

ence with animals. Moreover, we predict that participants will perform better with the inclusion of an informational prime while those with more animal experience will also be able to differentiate at a higher level than those without such experience. The provided prime enables participants to develop a pre-attentive focus on a particular method of categorization for the vocalizations that they will hear later on. By being able to anticipate and prepare ahead of time, people are capable of performing better on a specific assignment.

P-14 Toward the assessment of the kinesthetic memory span.

D. Pinzon (Surgery Department, University of Alberta), R. Vega (Computing Science Department, University of Alberta), B. Zheng (Surgery Department, University of Alberta)

In kinesthetic memory a subject is able to retain information from a motion with the objective of learning and reproducing it. Most of the current research in kinesthetic memory focuses in comparing performance of vision against visual-kinesthetic training. In this study we aim to elucidate the effectiveness of kinesthesia on its own in both performance and learning. During the task, subjects were given information via passive haptic guidance of five 2D patterns of increasing complexity without receiving visual or auditory stimuli. Each pattern was repeated six times by the participant before reproducing it. They repeated this task over a period of three weeks for a total of nine sessions. The results showed that subjects performed better recalling the direction of a movement in both short and long term memory, and in a lesser extent when remembering the length of the movement. Thus, knowledge of this kinesthetic behavior can help us create more robust studies to understand complex motor training gestures such those employed in wielding tools.

Keywords: Kinesthetic memory; cognition; assessment; guidance

P-15 Annoying the driver: Effects of Social and Emotional Distractions on Driving.

Scanlon, J. E. M. (Department of Psychology & Neuroscience and Mental Health Institute at the University of Alberta) Salopek, M. E. (Department of Psychology at the University of Alberta) Singhal, A. (Department of Psychology & Neuroscience and Mental Health Institute at the University of Alberta)

Distracted driving is a leading cause of vehicular accidents. Previous evidence has shown that emotional stimuli such as words and pictures

can bias attention and influence driving, while the presence of an in-car passenger may be distracting during difficult driving conditions. However, little research has been done to investigate the role of combined emotional and social distractions during driving. The present study tested whether the effects of an auditory emotional distraction (baby crying) on driving would be mediated by the presence of a social distraction (passenger). Following a practice run, participants performed simulated driving under four conditions: Driving alone in silence, driving with auditory distraction, driving with a passenger, and driving with both a crying baby and a passenger. The four driving scenarios also included a secondary visual reaction time task. The results showed differential effects on behaviour. Passenger presence decreased the RMS steering wheel rate, indicating a decrease in corrective driving measures. Emotional auditory distraction increased the lane position deviation and decreased reaction time consistency, indicating a decrease in overall driving performance. Moreover, the interaction of these two factors decreased time-to-collision, which is an indicator of collision potential. These results suggest that while a passenger may affect the actions and corrections of the driver, emotional distraction has a greater effect on attention and performance.

P-16 Correlation between verbal abilities and working memory performance.

T. Baird, M. Warren, U. Rai, K. Holmstrom & S. A. Wiebe (University of Alberta)

Baddeley (2003) hypothesized that the phonological loop has evolved in order to facilitate the acquisition of language. Children with language impairments tend to perform poorly on phonological working memory tasks; while typically developing children tend to perform better on similar tasks. We hypothesized that verbal ability scores were more strongly correlated with performance on the phonological working memory task than the central executive task. 191 children (male=92) aged 4 to 7 years were assessed using the forward word span task (phonological loop) and a complex listening recall task (central executive). The Woodcock Johnson III Test of Cognitive Abilities was used to assess verbal ability. Caregivers reported on age and gender. Correlation analysis and linear regression were completed. Our study found that better performance on the phonological task was positively correlated with better verbal ability scores ($r(182)=0.33$; $p<0.001$). Better performance on the central executive task also was positively correlated with better verbal ability scores ($r(180)=0.31$; $p<0.001$). However, there is no significant difference between the two ($z=0.21$;

$p > 0.05$). The linear regression determined that better verbal abilities were significantly associated with both phonological working memory task performance ($b = 0.019$, 95%CI 0.012, 0.026; $p < 0.001$) and central executive task performance ($b = 0.017$, 95%CI 0.012, 0.022; $p < 0.001$). The present study shows that verbal ability is significantly correlated with all components of working memory, not just the phonological loop.

P-17 Imagery-based memory strategies and the electrophysiology of association-memory encoding.

Y.Y. Chen (Neuroscience and Mental Health Institute, University of Alberta), S.S. Sahadevan (Faculty of Rehabilitation Medicine, University of Alberta), S.A. Wiebe & J.B. Caplan (Neuroscience and Mental Health Institute, Department of Psychology, University of Alberta)

Imagery-based strategies use our abilities to form mental pictures of information to enhance memory performance. Interactive imagery is a highly effective strategy for learning associations between pairs of words; for example, to remember CHAIR-CUP, one might imagine a cup on a chair. The peg-list method, another imagery-based strategy for learning serial lists, could be adapted to memorize lists of pairs. To use the peg-list method, one forms interactive images combining each new list-item with one of a standardized set of pre-memorized “peg” words (e.g., 1-BUN, 2-SHOE, ..., 10-HEN). We asked, does the peg-list method operate on the same interactive-imagery process (linking CHAIR to BUN) as interactive-imagery binding the paired items to each other (CHAIR to CUP)? We hypothesized that the ERP subsequent-memory effect for inter-item interactive imagery would resemble the subsequent-memory effect for item-peg imagery. Alternatively, the peg-list method might operate on different cognitive processes specialized for binding new learning to prior knowledge. Two groups of participants studied pairs using interactive imagery, or the peg-list method. Memory was tested with cued recall. Peg-list participants were also asked to report the peg associated with each studied item. There was a significant subsequent-memory effect for interactive-imagery-based cued-recall in the early 400-800 ms time, but for item-peg recall only in the later 800-1200 ms time. Moreover, the topography differed between the strategies. Our findings suggest interactive imagery binds pegs to words differently than item-item imagery, possibly exploiting the benefits of anchoring new information to previously learned knowledge.

P-18 Memory for order within associations can be dissociated from association-memory.

Kenichi Kato and Jeremy B. Caplan (Psychology Department, University of Alberta)

Models of memory for associations have made implicit assumptions about whether or not, and how, the order of constituent items is stored. Therefore, data on order-recognition judgements of word pairs may produce important empirical constraints on mathematical models of association-memory.

We ask whether subjects can store order-memory when they know they are tested either order-recognition or association-recognition. Participants studied lists of eight noun-pairs, A-B, C-D, ..., each followed by an initial recognition task. One group had order-recognition (distinguish A-B from B-A), Order-Attend group. The other group had ordinary associative recognition (distinguish A-B from A-D), which does not test order, Order-Ignore group. Half the pairs from each list were left out of these initial tests. After six such blocks, participants had a set of final recognition tests with all studied pairs. Our prediction was that the Order-Attend group would perform better than the Order-Ignore group if the final test was order-recognition, and the Order-Attend group would perform as better as the Order-Ignore group on the final associative-recognition. Unexpectedly, performance in the final order-recognition was equivalent for the Order-Attend and Order-Ignore groups whereas Order-Attend group was less accurate than Order-Ignore group in the final associative-recognition. This may indicate that order information may be stored separately from memory of the association itself.

P-19 Modification effects in compound nouns with novel modifiers.

Sara Laughton, Meagan Anderson, Alexandra Besoi, Christina Gagné, and Thomas Spalding (Psychology Department, University of Alberta)

The modification effect is the finding that true properties of unmodified concepts are judged to be less true in their modified counterparts (Connolly, Fodor, Gleitman, & Gleitman, 2007). Gagné and Spalding (2011, 2014) argued that this effect provides evidence against the automatic inheritance of properties and supports pragmatic reasoning in property attribution of combined concepts. In recent years, Spalding and Gagné (2015) have further explored this effect to uncover an inverse modification effect, whereby false properties of unmodified concepts are judged to be less false in their

modified counterparts. The current experiment is a follow up to an experiment that observed stronger standard and inverse modification effects in opaque-transparent compound nouns than in previous studies of novel compound noun phrases. Using the same head nouns as the previous experiment, we modified them using novel modifiers (e.g. scruy in scruyberries) which theoretically contribute just as little meaning to the combined concept as opaque modifiers (e.g. straw in strawberries), and thus, by the pragmatic reasoning approach, we expected similar results. Participants were shown a cue statement which they were instructed to assume was true (e.g. Almost all berries contain hesperidium) and then were asked to judge what percentage of the head noun or the compound noun had that property (e.g. What percentage of [berries] OR [scruyberries] contain hesperidium?). The standard and inverse modification effects were again observed, further supporting the pragmatic reasoning approach to property attribution in conceptual combination.

P-20 Comparing grouping effects of two order memory tasks.

Yang Liu (Psychology Department, University of Alberta) & Jeremy B. Caplan (Psychology Department and Neuroscience and Mental Health Institute, University of Alberta)

Effects of grouping have been extensively studied using forward serial recall, where participants study a list of items and recall the list by its presentation order. Inducing a grouping structure to the study list produces a scalloped serial position curve characterized by a mini serial position curve for each group, each showing within-group primacy and recency effects. An alternative paradigm to study order memory is judgements of relative order (JOR), where participants are asked to judge which item came earlier or later among two list items. The JOR task typically shows a U-shaped serial position curve, with no scalloped pattern. The U-shaped serial position curve was thought to favour a unitary instead of a hierarchical positional code. Here we directly compare grouping effects between serial recall and judgements of relative order. We wonder whether behavioral data from both tasks could be reconciled to support a common mechanism of order memory. Using both the serial recall and the JOR task between subjects, we tested on 9-item consonant lists, with 3 groups of 3 items induced by a temporal gap. Results from both paradigms were consistent with a 2-level hierarchical positional coding model. This suggests that apparent discrepancies in previous research were due to comparing response time patterns in the JOR task to error-rate patterns in serial recall.

P-21 The role of feedback related negativity in indexing prediction error might extend to complex value learning tasks.

Sucheta Chakravarty (Department of Psychology, University of Alberta), Isha Ober (Neuroscience and Mental Health Institute, University of Alberta), Christopher R. Madan (Department of Psychology, University of Alberta; Department of Psychology, Boston College), Yvonne Y. Chen (Neuroscience and Mental Health Institute, University of Alberta), Esther Fujiwara (Department of Psychiatry, University of Alberta; Neuroscience and Mental Health Institute, University of Alberta), Jeremy B. Caplan (Department of Psychology; University of Alberta, Neuroscience and Mental Health Institute, University of Alberta)

The feedback related negativity (FRN) is a deflection in the event-related potential (ERP) 200–300 ms following onset of feedback, thought to index reward prediction-error. FRN results are typically found when participants learn reward values of just a few stimuli (2–4). In many real-life learning situations, individuals may need to learn the values of larger sets of stimuli, in parallel. We tested the hypothesis that the role of FRN in indexing prediction error generalizes to such more complex learning conditions. We also tested whether FRN signals prediction error regardless of previously learned value, without the procedure introducing any such bias. Participants learned by trial and error, with feedback, the values of 48 randomly selected nouns and betted with (high-value) or against (low-value) word to earn 10 points rather than 1 point. On the 17th block, the values of half the items were reversed. For 14 (of 19) participants reaching high level of initial learning, prior to reversal block, the difference in accuracy (proportion of 10-point responses) for high (0.97 ± 0.01) and low-valued (0.96 ± 0.02) words was not significant ($t(13) = 1.16$, $p > 0.05$). A signal with similar timing and topographic distribution as FRN was present, which at a fronto-central electrode, showed a nearly significant main effect of switched vs. non-switched items, $F(1,13) = 4.65$, $p = 0.0504$, but interaction with value was far from significant, $F(1,13) = 0.04$, $p > 0.05$. These preliminary results extend the boundary conditions of FRN as a signal of prediction error, in a complex learning task, equivalently for high- and low-valued items.

P-22 Processing ambiguity in emotional facial expressions: Role of alexithymia.

Indra Roy, Alex MacRae-Korobkov, Alexa Nydegger, Angela Ma, Esther Fujiwara

Alexithymia is a personality trait associated with difficulties in identifying and describing emotions in oneself and others. Alexithymia has

been linked with problems in emotional face processing, using accuracy and response time data. We tested here how visual attention may underlie such problems, and particularly so, when resolving ambiguous facial expressions. We used a Tobii TX300 eye-tracker to record visual attention patterns while participants judged the percentage of two emotions in face photographs, morphed with varying percentages (5%-95%, 10%-90%, etc. up to 45%:55%, in 5% increments; Wilhelm et al. [2014]). Two faces with a 100% expressions of either emotion were presented concurrently as reference faces. 'Ambiguous' trials were defined as those in which the two emotions of the target face had a similar weight (35%- 65%). 'Clear' trials were all others (5%-25% or 75%-95% of one emotion in the target face). We measured alexithymia (TAS-20), anxiety (STAI-T), picture fixations, accuracy, and response latency. Preliminary findings showed more fixations on target faces than reference faces, and on ambiguous compared to clear target faces. Fixations on clear faces did not differ across emotion mixtures. Ambiguous fear-containing faces were fixated significantly longer than those containing happiness. Alexithymia was unrelated to accuracy and response time, but negatively correlated with picture fixations, especially fixations on target faces, regardless whether clear or ambiguous. In our study, eye-tracking was the most sensitive measure for detecting rather basic reductions in attention deployment during emotional face processing as a function of alexithymia.

P-23 Adults high on Autism Spectrum Quotient tend to speak less.

R.L. Enns, Y. Chen, & E. Nicoladis

There are individual differences in behaviours associated with Autism Spectrum Disorder, as revealed by the Autism Spectrum Quotient questionnaire (ASQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001; Stewart & Ota, 2008). In the present study, we test whether adults who score higher on the ASQ use language differently than those have lower scores on the ASQ. We predicted that the higher an individual scored on the ASQ, the fewer words they would use when speaking. This hypothesis is in line with the research of Norbury and Bishop (2003) regarding word use in children who have been diagnosed with Autistic Spectrum Disorder. In the current study, adult males filled out the Autism Spectrum Quotient questionnaire and participated in two different tasks: a question and answer task where they answered both objective and personal questions, and a storytelling task where they summarized the events in two

cartoons. The dependent variable is the number of words used in the two different tasks. The initial results show a weak negative correlation between the number of words used in the question and answer task and AQ scores, and no correlation between the number of words used during the storytelling task and AQ scores. We argue that the question and answer task might more crucially involve a dialogue, that is, sensitivity to the interlocutor's communicative needs, than a storytelling task.

P-24 Music as medicine: A random control trial of music therapy intended to reduce BPSD in long-term care residents with dementia.

D. Milke (CapitalCare), J. Leask (CapitalCare), E. Truscott (University of Alberta) & J. Lee (University of Alberta)

Music therapy has been proposed as a non-pharmacological approach for reducing the behavioral and psychological symptoms of dementia (BPSD). Another systematic review that included a meta-analysis suggested that music therapy is effective for the management of BPSD (Ueda, Suzukamo, Sato, & Izumi, 2013). However, a Cochrane review found evidence weak at best and reported that randomized controlled trials (RCTs) are rare (Vink, Bruinsma, & Scholten, 2003, 2010). Our study performed a conceptual replication of two RCTs by Raglio et al. (2008, 2010), which did find that music therapy reduced BPSD. We selected 60 residents from two dementia units in Edmonton, AB, and randomly assigned them to either the music therapy or a control group. Resident assessment data (MDS-RAI) was extracted for each participant and statistically analyzed; items extracted for analysis were identified as highly similar to the assessment tools used by Raglio et al. Results of the analyses indicate that music therapy did not appear to reduce BPSD, a finding that is inconsistent with the Raglio et al. studies that we sought to replicate. The discrepancy between those studies and ours may be explained by subtle differences between tools, i.e., although our InterRAI items were identified as being similar to the behavior assessment used by Raglio et al., it is possible that they were not sufficiently sensitive to detect changes in BPSD. However, our qualitative analyses were encouraging. We recommend that future studies attempt to calibrate MDS-RAI items to the Neuropsychiatric Inventory used by Raglio et al.

P-25 Playing with cards: Preservation of emotion-focused preferences in Alzheimer's disease.

L. Bohn (Psychology Department, University of Alberta), S. T. Kwong See (Psychology Department, University of Alberta), & H. H. Fung (Psychology Department, The Chinese University of Hong Kong)

Socioemotional selectivity theory (SST) contends that future time perspective impacts social motivation. Younger adults perceive time as open-ended and prioritize goals related to optimizing long-range outcomes (e.g., knowledge acquisition). Older adults, who increasingly feel the pressure of time and its passage, prioritize goals related to optimizing emotional well-being in the present moment. We report elsewhere (Bohn, Kwong See, & Fung, in press) that persons with moderate severity Alzheimer's disease (AD) have distorted time perspective but, contrary to popular belief, the distortion is not a regression to youth; rather, individuals with AD remain oriented to their position in life as older adults. Given this understanding, the present research examined social motivation in moderate AD as predicted by SST. To reveal the developmental trajectory against which to examine participants with AD (PAD; $M = 85.38$ years), young (YA; $M = 22.48$ years), young-old (YO; $M = 67.56$ years), and old-old adults (OO; $M = 80.24$ years) were recruited as comparisons. Participants completed two card-sort tasks in which they placed cards describing social goals and activities into piles according to their relative importance. Multidimensional scaling revealed common dimensions along which groups considered items and indicated that the importance of these dimensions varied across groups. As expected, dimensions related to knowledge acquisition and autonomy were more important in youth than older age. Emotional dimensions were more important to the older groups (YO, OO, and PAD) than YA, and for PAD, there was even greater inward focus and emphasis on emotional regulation.

P-26 Musical intervals, neural networks, and coarse coding.

Brittany Koch-Hale and Michael R.W. Dawson (Biological Computation Project, Department of Psychology, University of Alberta)

Harmony is one of the central properties of Western music; in its simplest form it involves the simultaneous playing of two musical sounds. Each of these pairs is called a musical interval. Importantly, not all intervals are the same in terms of their musical pleasantness or consonance. For instance, a perfect octave (two tones 12 semitones apart) is far more consonant than a minor second (two tones 1 semitone apart). We presented artificial neural networks pairs of musical intervals, and trained

them to judge which member of the pair was most consonant. In the first study all intervals were taken from the key of A major; the training set was comprised of 154 different pairs of intervals. A very simple network (a perceptron that had no hidden units) learned to judge the relative consonance of the interval pairs. An examination of the connection weights of this network revealed that its structure was almost perfectly correlated with Krumhansl's (1990) tonal hierarchy. In a second simulation each interval in a stimulus was taken from the same musical key, but all 12 major keys were used to define the training set. This more complex training set was made up of 1848 different stimuli. Once again a network was able to learn this problem, but it required 10 hidden units in order to accomplish this. The Krumhansl tonal hierarchy was not found in this network when its internal structure was interpreted. Instead, the network developed an elegant coarse coding of musical consonance in which...

P-27 Investigating the neural network of spelling.

Kulpreet Cheema & Jacqueline Cummine (Faculty of Rehabilitation Medicine, University of Alberta)

Dyslexia is a neurodevelopmental disorder characterized by persistent reading and spelling impairments. Most of the research has focused on assessing reading skills. But individuals with dyslexia also face spelling problems that persist into adulthood (Bruck, 1993). Interestingly, the neural networks associated with spelling have not been characterized in skilled readers or individuals with dyslexia. The current study aims to identify the underlying neural network associated with spelling in skilled adult readers. Such information is necessary as it provides a framework for the selection of behavioural tasks and brain areas to be analysed for children. Method: Participants (N=10) took part in two tasks while in the MRI: a go no-go spelling lexical task, where participants were instructed to name aloud the letter string if it spelt a real word, and a go no-go spelling lexical task, where participants were instructed to name aloud the letter string if it did not spelt a real word. Using a region of interest approach, we will explore the neural networks associated with the spelling process. Expected Results: We anticipate that a network of regions including orthographic (inferior temporal gyrus), phonological (supramarginal gyrus) and articulatory (supplementary motor area) will be involved in both go no-go spelling tasks. Conclusion: The data from the current study will be a critical first step in understanding the networks associated with spelling and will inform the next phase of studies that will examine children with and without

dyslexia.

P-28 **Vive la différence! Why bilinguals gesture.** J. R. Aziz & E.

Nicoladis (Psychology Department, University of Alberta).

Gestures serve many communicative functions, including aiding in language access and message construction, particularly in spatial tasks. Some researchers have argued that gesture frequency is linked to proficiency in bilinguals. Since bilinguals are often more proficient in one language than the other, they might gesture more in their weaker language to facilitate language access. Conversely, other findings suggest that bilinguals gesture more in their stronger language. To reconcile this controversy, Nicoladis (2007) proposed that bilinguals' proficiency might interact with task: the more spatial the task, the greater the effects of proficiency. To test this proposal, we recruited two groups of French-English bilinguals: participants with French as their first language and English as their second language, and participants with English as their first language who had attended French Immersion or FSL programs. We measured proficiency by categorizing participants by first language and by measuring their vocabulary scores in both languages. In French and English, we asked participants to do two tasks: 1) watch a cartoon and tell the story back and 2) talk about how they learned French and English. Story-telling relies heavily on spatial memory, so we predicted that this task would elicit more gestures than talking about language histories. As expected, participants gestured more in the story-telling task. There were, however, no proficiency effects or interactions between proficiency and task. Instead, participants showed a strong tendency to gesture according to their own individual style. These results suggest that individual communication styles outweigh the effects of proficiency in bilinguals.

P-29 **Keeping relationships afloat: An investigation of factors that correlate with implicit theories of relationships.**

V. Bergstrom (Psychology Department, University of Alberta)

This study investigated familial relationship and media factors that may correlate with implicit theories of relationships (ITRs). ITRs are comprised of destiny and growth beliefs. Growth beliefs involve believing that relationships are malleable; relationships require maintenance, and conflicts can bring couples closer together. Conversely, destiny beliefs involve believing that relationships are rigid; relationships should be effortless, and con

flicts are a sign that a relationship should end. Ninety-seven undergraduates at the University of Alberta completed a questionnaire for course credit. Participants high in growth beliefs perceived their parents as possessing more growth beliefs, were more willing to initiate relationship discussions with their companion, were less likely to listen to music for under two hours per week, were more likely to have parents who stayed together, and were more likely to take higher-level science and math courses during high school. Participants who held more destiny beliefs perceived their parents as possessing more destiny beliefs, were more likely to seek revenge before terminating a relationship after extradyadic behaviour, and were more likely to be in relationships. These relationships between ITRs and the other factors remained when controlling for differences in attachment style, lay dispositionism, self-efficacy, and incremental vs. entity mindsets. The results of this study are important because the more we know about the factors that predict adaptive and maladaptive relationship beliefs, the more we can work towards reducing the gap between individuals' desire to be in romantic relationships and their ability to maintain them.

P-30 The Modification Effect in Opaque-Transparent Compounds.

L. Chin, A. Besoi, C. Gagné & T. Spalding (Psychology Department, University of Alberta)

The standard and inverse modification effects are recently discovered judgment effects first studied by Connolly et al. (2007). The standard modification effect refers to the fact that true properties of unmodified nouns are judged to be less true than their modified counterparts. Subsequently, the inverse modification effect refers to the fact that false properties are judged to be less false. The aim of our current research is to test whether the modification effect and inverse modification effect are observed in the processing of opaque-transparent (OT) compound words. In previous research using compounds with non-word modifiers (Gagné & Spalding, 2011), the explanation for the modification effects was given through the expectation of contrast between unmodified and modified nouns. We predicted that these effects should also apply to OT compound words as these words are morphologically similar to the previous word stimuli. Almost all, some, and almost no quantifiers were compared to compound and head noun word types in order to assess their interaction. Participants were shown a cue statement (e.g., Almost all bugs have xiphosura) and directed to view the statements as true. Participants were then required to indi

cate a level of likelihood ranging from 0-100% comparing the head noun of a compound to an unknown property. For example, What percentage of bugs have xiphosura? Singularly the quantifiers and difference between word types were graphically interpreted. The results of this study suggest that the expected contrast in property attribution also applies to OT compounds, as predicted.

P-31 Language and acculturation among Chinese immigrants.

M. Chen, W. Hua, K. A. Noels & L. Yao (Psychology Department, University of Alberta).

Under the influence of Canadian culture and social environment, Chinese immigrants feel more like a part of Canada and members of Canadian society over time. The process of reconciling the cultural differences between their country of origin and their adopted country become one major issues for Chinese immigrants. This study address the general question of how does individual's level of English skills and their attitude toward English-language in their environment affect their recognition of their ethnic identity and type of acculturation. Six Chinese immigrants were served as participants to participate a 30-40mins individual interview, then completed two questionnaires. The interview and questionnaires data were collected regarding: English language proficiency, pre and post-migration English learning experiences, acculturation and ethnic identity status. Thematic analysis strategy was used to analyze the data, and the results revealed that English language proficiency played an important role for acculturation. In addition, participants' attitudes towards the English language usage also have a crucial impact toward cultural adaptation and ethnic identity status. More specifically, participants, who considered English simply as a tool to live and work in Canada, were more likely to adapt to Canadian culture more slowly and poorly, while others who viewed English useful outside of daily and mandatory situations, were better able to adapt to Canadian culture more rapidly and fully.

P-32 Healing through Vulnerability and Storytelling.

Tony Luong & Elena Nicoladis (Women's and Gender Studies & Psychology Department, University of Alberta).

The function of a personal narrative serves to provide us with a sense of self as we remember, reflect on, and share with others the experiences of

our lives. The act of storytelling helps us to explore our authentic selves as we make meaning from our past, present, and future selves. There are many different possibilities to express and share our stories as we become increasingly aware of the ambiguity of the world and our place within it. However, it can be distressing to navigate through deeply personal and painful recollections of one's personal history. Faced with emotionally difficult experiences places us in vulnerable positions. But even so, vulnerability can be reimagined as a strength, and as a place of healing, growth, and transformation. In our research, we aimed to address that within a society that continues to operate on power imbalances, Indigenous communities are deeply marginalized and stigmatized due to the lasting intergenerational impacts of residential school systems and colonialism. Consequently, younger generations still carry the burden of a violent and traumatic history. The objective of this project was to investigate how sharing these emotionally vulnerable parts of oneself has the potential to be healing and improve well-being for residential school survivors. In others words, what is the value of storytelling for the storytellers themselves? How can we rethink vulnerability as a potentially generative process that can bring us to new places of understanding ourselves and each other?

P-33 A Qualitative Study: Investigating the Assets and Liabilities of Requiring Foreign Language Courses in Canadian universities.

D. Kwon (Psychology Department, University of Alberta), X. Zhang (Educational Psychology Department, University of Alberta) & K. A. Noels (Psychology Department, University of Alberta)

According to recent studies, graduate job applicants have to fluently speak foreign language(s) for them to be successful, and suggests that universities and colleges have to modify the language teaching strategy to ensure that candidates can tackle the rising unemployment rate (Szucs et al., 2014). However, another study revealed that many students in compulsory language learning courses get lower than average levels of achievement and persistence (Cox, 2012). On the one hand, language requirements seem to be needed for students to be prepared after their education is completed, but on the other hand, mandatory forces of these teachings seem to counteract this purpose. To investigate this idea more closely, one of the goals of this study was to determine the current profile of language requirement, and to see the advantages and disadvantages of foreign language requirements in Canadian universities from students' perspectives. 326 student

participants (68.1% are female) were asked to complete two open ended questions for language requirement and learning: what are the advantages and disadvantages of mandatory foreign language courses. Thematic analysis strategy was used to analyze the data, and the results revealed that in the advantages category, three major themes were classified: "personal development", "society benefits", and "university benefits". In the disadvantages section, there were also three major themes that were classified: "no resources to handle the situation", "self-detriment", and "lack of motivation". This information may be significant in whether school systems should stay the same, or change in future.

P-34 The language-identity link in international students to Canada.

G. L. Diniz, K. A. Noels, A. Jackson (University of Alberta).

This study of 109 international students enrolled at the University of Alberta focused on the following factors: age in regards to language acquisition, confidence in the L2, contact with both Canadians and foreign nationals, and identity. The participants were categorized into those who came from past British or American colonies and those who came from other countries. As expected, students who were from British/American protectorates reported higher English vitality ($M = 4.85$, $SD = 0.87$, $p < .01$) than students who were not ($M = 3.91$, $SD = 1.25$). The former also learned English at an earlier age ($r = .71$, $p < .01$) and exhibit a significant correlation between confidence and Canadian identity. For these students, more confidence in English predicted higher levels of Canadian identity ($r = .743$). These results are consonant with the premise that language is an element of culture, and therefore the acquisition of both overlaps. That no other significant links were identified can be attributed to the fact that international students are voluntarily and temporarily abroad, which affects their identity differently from other migrants. This raises an interesting question that merits further research.

P-35 A study of international students' language aptitude and adjustment under stereotype threat.

R. Chakrabarty, K. Chaffee, N.M. Lau, K. Noels (Psychology Department, University of Alberta)

Stereotype threat occurs when people feel they may be confirming negative stereotypes about their group. With the large numbers of inter

national individuals entering the Canadian population, there is a need to understand the effects of stereotype threat on the performance of minority groups. This study was aimed at better understanding the effects stereotype threat have on the language learning ability of minority groups, as well as other factors such as their adjustment to Canada, and self-esteem. The final sample consisted of 69 male students (40 for non-threat condition, 29 for threat condition) who had lived in Canada for less than five years and had a non-English mother tongue. In the experimental condition, threat was induced by telling participants that the purpose of the study was to examine why women have higher language aptitude than men. Both groups (non-threat and threat) completed two language aptitude tests. Afterwards, they completed a questionnaire, which measured factors such as adjustment to Canada and self-esteem. One of the aptitude tests showed a non-significant trend such that participants in the threat condition performed more poorly. Threatened students also reported marginally lower self-esteem and less belief in their own competence. Participants in the non-threat condition reported more visits to Canadian homes, and a higher perception of being able to interact with English-speaking White Canadians on an equal basis.

P-36 How Entity and Incremental Language Mindsets Affect Attitudes towards Immigration Policy.

T. Irvine, M. Elliott, M. Lou, & K. A. Noels (Psychology Department, University of Alberta)

Individuals with an entity language mindset view language ability as fixed and stable over time. Individuals with an incremental language mindset view language ability as adaptable and dynamic. The current study hypothesized that individuals primed to have an incremental mindset would have more positive opinions about the immigration policy and immigrants in general, whereas the individuals primed to have an entity mindset would have more negative opinions on the policy and would have more avoidance attitudes towards immigrants. 80 Caucasian English-speaking participants read either an entity priming article or an incremental priming article. They then listened to a voice clip of a Mandarin speaker and had to rate the speaker's English ability as well as answer a survey about their mindset towards the immigration policy. The results show that both the incremental and entity groups evaluated the level of accentedness and language ability of the person in the voice clip similarly. However, the incremental group believed that the immigrant had a greater potential to improve her

language ability. In turn, their beliefs about the immigrant's potential of improvement predicted their positive attitudes towards the immigration policy. The results suggests that language mindsets can influence policy making and educating individuals on language ability could create a more supportive policy for immigrants.

P-37 The effect of language mindsets on language anxiety among international students.

Ashley Huang, Clarisse Sheane, Brian Park, Almutaserbella Sawalha, Taylor Irvine, Nigel Mantou Lou, Kimberly Noels

The language barrier is a major challenge to many international students and immigrants in Canada. This study investigated how international students' beliefs about language intelligence may affect their language anxiety when interacting with a native speaker. Participants (N = 40) were primed with mock articles that presented language intelligence as either an innate skill (entity condition) or a developed skill (incremental condition). Participants then engaged in a casual interaction with a Anglo-Canadian confederate. The results showed that there was no significant difference between the two conditions on their self-reported language anxiety. However, there was a trend that participants in the incremental condition reported greater beliefs that their English can be improve through effort ($F = 1.52, p = .20$). These participants who had stronger effort beliefs also adopted more approach strategies during the interaction and reported less language anxiety. As we continue collecting data, we expect to see this trend continue. The results suggest that international students with an incremental mindset may be more confident in social interactions with native English speakers. Encouraging immigrants to adopt an incremental mindset towards language learning may positively affect their adjustment and integration into Canadian society.

P-38 An Exploration of the Perceived Femininity of Language Learning.

Pranav Bali, Millie Mohan, Kathryn Chaffee, Kimberly Noels, & Lauren Elcheson (Department of Psychology, University of Alberta)

We often see a greater enrollment and interest in language courses and language related activities by females rather than males. Perhaps due to societal norms, language is seen as a predominantly feminine sub

ject. Due to a lack of prior research on this topic, the present study aims to explore how gender and language learning interrelate. In this study, university students who were either language learners (n=156) or non-language learners (n=200; 48.28% male) completed an online questionnaire assessing their identity as language learners, their gender identity, their stereotypes towards language learners, and their beliefs about language learning. Male non-language learners, when compared to male language learners, exhibited more traditional views of gender roles and greater sexism. Correlational analyses found that language learners, when compared to non-language learners, believed that those in a language field worked more weekly hours. Another analysis indicated a trend that females, when compared to males, believed individuals in language fields had higher annual salaries. This coincides with the finding that women believed that language majors are more hardworking. In future studies it would be interesting to see how different cultures or differences in gender identity, among males and females, might play a role in their language learning interests and outlook on such topics.

P-39 The development of point-following in infancy: a longitudinal and naturalistic study.

R. Veinott-McKeough, P. Barbosa, & E. Nicoladis (Psychology Department, University of Alberta)

The ability to follow a point has been shown to play a key role in facilitating communication and language development (Kita, 2003). However, most of the existing research on the development of point following was conducted in a controlled experimental setting, prompting the infants with few stimuli and several pointing instances (Bertenthal, et al. 2014; Daum et al., 2013), which is untrue of a natural setting (Barbosa et al., 2015). The primary objective of our study was to investigate the acquisition and development of point following in a natural environment. Our study was longitudinal and observational, and followed four infants from 6 months of age until they were 12 months of age. Infants were videotaped at home at approximately two-week intervals over 2 to 3 day sessions ranging in length from approximately 30 minutes to 2 hours. There was approximately 20 hours of footage for each infant. There was

a general trend seen with all four infants. At 6 months of age the infants were fairly good at point following, then there was a decrease in point following around 7-9 months for all of the infants; and finally an increase around 10 months in point following, when the behaviour seemed to be consolidated. This finding suggests that around 9 to 10 months of age infants might be re-evaluating and re-learning the pointing gesture, i.e., finally understanding that when they see a pointing it means that someone wants them to look at something.

P-40 The association between physical activity, sedentary time and response inhibition in early childhood.

Abdul Rahman, A., Pertschy, D., Carson, V. & Wiebe, S.A. (University of Alberta).

Physical activity is associated with better executive function in adults and older children. However, few studies have used objective measures to examine this relationship in early childhood, a period of rapid development. In the present study, we measured response inhibition and its neural correlates. We also measured children's physical activity and sedentary behaviour using accelerometry. Data collection for this study is in progress, but preliminary analyses were conducted in a sample of 25 children (8 boys, 17 girls) aged 2.5 – 5.0 (mean = 4.0, SD = .65). Children completed a Go/No-go (GNG) task measuring response inhibition while scalp EEG was recorded. Children wore an Actigraph accelerometer for 1 week, and we calculated time spent in sedentary behaviour (<25 counts/15-sec), light-intensity physical activity (LPA; 25 to ≤420 counts/15-sec), and moderate- to vigorous-intensity physical activity (MVPA; >419 counts/15-sec). Correlations were conducted between physical activity, sedentary behaviour, GNG accuracy and response time, and amplitude and latency for N2 and P3 event-related potentials. Higher levels of physical activity were associated with greater accuracy on Go trials ($r=0.37$, $p < .05$) and slower responding ($r=0.45$, $p < .05$). Smaller P3 amplitude on Go trials was associated with higher MVPA ($r=-0.40$) and total physical activity levels ($r=-0.36$). As P3 amplitude may represent the extent of neural resources recruited, this association may imply that children with higher physical activity levels require lesser neural resources to perform Go trials. These findings, though preliminary, suggest that physical activity in early childhood is important for the development of response inhibition.

P-41 Teacher-Child Relationship Quality and Behaviour Regulation in Preschool.

D. Hui & W. L. G. Hogg (University of Alberta)

Behaviour regulation, which refers to children's ability to limit impulsive behaviours (e.g. grabbing things from others) and act appropriately (e.g. waiting patiently and sharing), is important for preschool children's school success. The relationships children form with their teachers have an impact on the classroom opportunities children receive that aid in their behaviour regulation development. Greater increases in behavioural regulation skills have been found in children with closer teacher-child relationships. When children share a close, comforting relationship with their teachers, they may become more skilled at managing impulsive behaviors because teachers are more likely to recognize these children for their skills or model these behaviors for children. Children's ability to regulate their behaviours improves between early and middle childhood, however, there have been fewer studies in this area on preschool children. The current study examines how teacher-child relationship quality predicts change in children's behavioural regulation skills from the fall to spring of children's preschool year. We also investigate if gender moderates these associations. Participants included 214 preschool children. Data were collected in the fall and spring. Behavioural regulation was assessed using the Head-Toes-Knees-Shoulders (HTKS) task, where children had to respond to paired commands (e.g. touch your head with touch your toes) in the opposite way (e.g. touch their toes when told touch your head). Preliminary analyses show that children's teacher-child relationship quality has a positive correlation with children's performance on the HTKS task. Regression analyses for the two time points will be conducted next.

P-42 Parent-child shared book reading and the development of children's executive function.

M. N. Pinkoski, B. M. Galal, S. Dhalla & S. A. Wiebe (University of Alberta)

Parental behaviour and activities have been shown to affect children's development of executive function (EF). Executive function refers to the higher order cognitive processes responsible for co-ordinating goal-directed behaviour and responses to novel or ambiguous situations (Hughes & Ensor, 2009). This study will explore the relationship between parent-child shared book reading and children's executive function development, as

no current research exists on the potential relation between these two. Participants were 36 to 43-month-old children along with one of their parents. Parents and children completed a book reading interaction in the lab, which was video-recorded. These videos are currently being coded offline for parent and child engagement and supportive behaviours. Parents also completed a questionnaire reporting on their shared book reading experiences with their children, family background information, and an indirect measure of children's exposure to books. Children completed a short EF battery measuring working memory, inhibition, and delay of gratification. Correlations will be used to examine the relationship between parent-child book reading measures and the EF measures. This study could help to extend our understanding of parent-child book reading, and may shed light on cognitive benefits of this activity.

P-43 Parental influences on executive functions in early childhood: Differential effects of maternal responsiveness and harshness.

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Early childhood is an important time for researchers to study the influences of parenting on children's developing executive functions (EFs). There is mounting evidence to suggest that high-quality parenting (e.g., parenting characterized by high warmth and autonomy support) in early childhood is associated with better EFs in children, while harsh parenting is associated with worse EFs. However, it is unknown how these two dimensions of parenting interact to affect the development of EFs in children. The present study will investigate how maternal responsiveness and harshness act and interact to affect the development of EFs in early childhood. Participants are 151 3-year-old children and their mothers, drawn from the Midwestern Infant Development Study cohort. Children completed a battery of tasks assessing EFs and mother-child dyads were videotaped completing free play, structured play, and waiting tasks. These interactions are being coded for responsive involvement and harsh discipline using the Parent-Child Observational Coding Scheme (Wakschlag et al., 2008). Data analysis is currently underway. Multiple regression will be used to explore the additive and interactive effects of responsiveness and harshness on EFs in early childhood. This study will add to our understanding of early social factors affecting the development of EFs by providing a more fine-grained analysis of the effects of multiple aspects of parenting on children's emergent EF abilities.

Campus Map

