ROYCE-HARDER RESEARCH CONFERENCE

Thursday, April 5, 2018 - Friday, April 6, 2018
Edmonton Clinic Health Academy (ECHA) 2-140

DAY 1 - Brian Harder Honours Day & Undergraduate Research Showcase
1:00 PM - 5:00 PM

Keynote Address: Dr. Sandy Jung
MacEwan University
*The Risky Business of Sexual and Intimate Partner Violence Prevention*

DAY 2 - Joseph R. Royce Psychology Conference
8:30 AM - 5:00 PM

Keynote Address: Dr. Sara Hart
Florida State University
*Precision Education Initiative: Moving Towards Personalized Education*

Invited Internal Speaker: Dr. Jeff Bisanz
University of Alberta
*Improving Children’s Understanding of the Equal Sign: From Experimental Control to Chaos and... Maybe Beyond?*
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DAY 1 - Brian Harder Honours Day & Undergraduate Research Showcase
April 5, 2018

1:00 - 1:50 PM  Keynote Address: **Dr. Sandy Jung**

2:00 - 3:00 PM  Scientific Café: Third Year Honours Thesis Proposals

3:00 - 4:00 PM  Fourth-Year Honours Blitz Talks

4:00 - 5:00 PM  Undergraduate Research Showcase Poster Presentations and Reception

DAY 2 - Joseph R. Royce Psychology Conference
April 6, 2018

8:00 - 8:45 AM  Poster Setup & Coffee

9:00 - 10:15 AM  Keynote Address: **Dr. Sara Hart**

10:15 - 10:45 AM  Poster Presentations & Coffee

10:45 - 11:45 AM  Oral Presentations Session 1

11:45 - 12:45 PM  Poster Presentations and Lunch

12:45 - 1:45 PM  Invited Symposium

2:00 - 3:00 PM  Royce Scientific Café

3:00 - 3:15 PM  Poster Presentations & Coffee

3:15 - 4:00 PM  Oral Presentations Session 2

4:00 - 5:00 PM  Invited Internal Speaker: **Dr. Jeff Bisanz**
Day 1 Keynote Address:
The Risky Business of Sexual and Intimate Partner Violence Prevention

Dr. Sandy Jung
Associate Professor
Department of Psychology
MacEwan University

Dr. Sandy Jung is an Associate Professor in the Department of Psychology. She is a recipient of both the Distinguished Teaching Award and Distinguished Research Award at MacEwan University. She regularly teaches abnormal and forensic psychology and actively supervises honours and advanced research students. Her scholarly work focuses on the prevention of sexual assault, child sexual exploitation, and intimate partner violence, and involves several community collaborations. She has numerous peer-reviewed publications, and her research is funded by both internal and major external grants. Prior to her current academic position, she was a forensic psychologist, providing assessment, treatment, and risk management of violent and sexual offenders. She is an Executive Board Member of the Association for the Treatment of Sexual Abusers (ATSA), Editorial Board Member for the journal, Sexual Abuse, Vice-Chair of the Criminal Justice Section in the Canadian Psychological Association, an Assistant Adjunct Professor in the Department of Psychiatry at the University of Alberta, and an affiliate of the Forensic Psychology Research Centre at Carleton University.

Day 2 Keynote Address:
Precision Education Initiative:
Moving Towards Personalized Education

Dr. Sara Hart
Associate Professor & Developmental Psychology Area Director
Department of Psychology & Florida Center for Reading Research
Florida State University

Sara Hart is an Associate Professor of Psychology and Research Faculty at the Florida Center for Reading Research, Florida State University. Broadly defined, her research interests focus on the sources of individual differences on cognitive ability and achievement development. Primarily she focuses on how genetics and the environment interplay to influence the development of reading and math skills. Additionally, she is interested in incorporating genetic and family environment information into classrooms.
Dr. Jeff Bisanz
Professor Emeritus
Department of Psychology
University of Alberta

Jeff Bisanz is Professor Emeritus in the Department of Psychology at the University of Alberta. The main focus of his research is on cognitive development in children and, in particular, the development of mathematical thinking. He served as Director of the Community-University Partnership for the Study of Children, Youth, and Families (CUP) from 2000-2011, Chair of the Department of Psychology from 2012-2016, and as a member of the Mayor’s Task Force for the Elimination of Poverty in Edmonton (2014-2016). Currently he is Co-Chair of CUP’s Steering Committee, Co-Chair of the Stewardship Round Table for EndPovertyEdmonton, and Co-Chair of the Early Learning and Care Steering Committee in Edmonton.

Invited Internal Address:
Improving Children’s Understanding of the Equal Sign: From Experimental Control to Chaos and . . . Maybe Beyond?

Dr. Jeff Bisanz
Professor Emeritus
Department of Psychology
University of Alberta

DAY 1 KEYNOTE ADDRESS
1:00 - 1:50 PM | Room: ECHA 2-140
The Risky Business of Sexual and Intimate Partner Violence Prevention

Dr. Sandy Jung
MacEwan University

Risk and threat assessments have become a core task for professionals in the criminal justice system to make offender management decisions. Canadian researchers have been influential in the field of forensic psychology. A theory of criminal conduct known as the Risk-Need-Responsivity (RNR) model, developed by two Canadian researchers (Andrews & Bonta, 2010), guides offender management and rehabilitation. RNR represent three guiding principles that advises criminal justice professionals on who should be treated, what should be targeted in treatment, and how the offender should be engaged in treatment. The first principle, the risk principle, asserts that the level of service must match an offender’s risk level. Therefore, effective interventions are those that target higher risk offenders, and in practice, we should assign greater intensive services to higher risk offenders. In this talk, Dr. Jung will introduce the risk principle of the RNR model and how the RNR principles can inform law enforcement by maximizing positive outcomes and reducing further victimization. She will present research that has led to empirically-validated practices and highlight how these practices can further prevent violence in the community.
Café Session 1 (2:00 - 2:15 PM and 2:15 - 2:30 PM)

C1 Fishing under pressure: The effects of time pressure on partial inhibition and its neural correlates in preschool children
Room: ECHA 1-163
D. S. Heath & S. A. Wiebe (Psychology Department, University of Alberta)

Response inhibition is the ability to suppress inappropriate or no-longer-required actions in response to contextual changes. It is commonly assessed using the Go/No-go task (GNG) in which participants respond on Go but not No-go trials; most trials are Go trials to set up a habitual tendency to respond. Early childhood is a period of rapid development in response inhibition. Chevalier et al. (2014) found that children who responded more quickly on go trials were likely to initiate inappropriate responses to no-go trials. They used a modified GNG task to allow both successful inhibition and partial inhibition responses, by requiring children to produce a two-part response. On successful inhibition trials, the response is stopped before it was initiated. On partial inhibition trials, a response is initiated but not completed. The proposed study will examine whether manipulating children's response speed by varying time pressure will affect their behavioural performance (partial and successful inhibitions) and neural correlates (event-related potentials). We will use a GNG task where children catch some fish but avoid catching other kinds of fish, and time pressure will be varied across blocks by giving children more or less time to respond. We hypothesize that when time pressure demands are high, children will make more partial inhibition responses on No-go trials because they will have insufficient time to inhibit their habitual tendency to respond.

C2 Is memory in the music? The cognitive architecture of working memory
Room: ECHA 1-153
R. L. Q. Gagnon & E. Nicoladis (Department of Psychology, University of Alberta)

There are several intellectual experiences that are thought to shape the structure of working memory (WM). One such experience is music training, which may somehow influence the way that the central executive coordinates information in the WM system. This suggests that musicians may have a unique cognitive architecture compared to those without such training. The present correlational study will compare individuals with formal instrumental music training to those without musical training using six working and motor memory tasks. The tasks used to examine visuospatial memory, auditory/verbal memory, and motor memory are the Corsi block tapping test, the digit span test, and the Wu and Coulson motor memory test, respectively. In addition, three tasks will be used to examine each of these individual memory components in conjunction with working memory: the backward Corsi block tapping test, backward digit span test, and the TAMI test (Test of Ability in Movement Imagery), respectively. We expect musicians to score higher on all tasks, with notably higher scores on the tasks involving working memory than non-musicians. This research aims to shed light on experiences that may play a role in improving working and motor memory functioning, which could have applications in future school curriculum decisions regarding music education.
C3  What do you see in a face? How people see and describe emotions in a face.
Room: ECHA 1-152
Alexa Byrd, Mursal Mohamud, Annie Porthukaran, Winta Ghebremicael (Psychology Department, University of Alberta), & Esther Fujiwara (Psychiatry Department, University of Alberta)

Alexithymia is a personality trait referring to difficulties identifying and describing emotions, a restricted imagination, and an externally-oriented communication style. This trait represents a trans-diagnostic vulnerability factor for mental illness. Alexithymia may be related to higher perceptual/attentional thresholds for detection of emotional information, combined with an expressive deficit when describing this information in a precise and differentiated way. However, no study we are aware of has evaluated these two aspects of potentially problematic emotional processing in alexithymia together. We attempt to address this disparity by invoking written descriptions of emotional facial expressions. The current study aims to quantify viewing patterns of emotional facial expressions that either show clear or mixed emotions, and to relate these patterns to descriptions of the emotional expressions, in high and low alexithymic individuals. A total of 200 participants will be included (native English speakers), scoring as high alexithymic (HA) or low alexithymic (LA) on the Toronto Alexithymia Scale (TAS-20). Participants will be asked to describe each emotional face they see as precisely as possible. This is followed by a second block of faces where a maximum of two words is allowed. We predict that (compared to LA) HA participants will use more words in general to describe the emotions, and their descriptions will be more neutral, less arousing, and less specific. We also predict that HA participants will show less attention to the eye-region of faces. Finally, we will explore if verbal-expressive differences between HA and LA groups are moderated by changes in eye-attention.

C4  The impact of Taekwondo on academic success through enhanced emotional regulation
Room: ECHA 1-152
A.M. Domingo & E. Nicoladis (Psychology Department, University of Alberta)

This research evaluates how sports can help children acquire skills and strategies in emotional regulation and its impact on academic success. Taekwondo is a sport that requires discipline and intensive training to achieve long-term goals. In this study, we will explore if emotional regulation strategies can be learned through experience with Taekwondo. Recently enrolled children ranging from 6-12 years old in Sung Lee Taekwondo will be followed throughout the school year to track their academic performance. Baseline measures of emotional intelligence and academic performance will be collected through self-report measures from the children and the parents at the beginning of the school year. In addition, a vocabulary test will be conducted to test the child’s scholastic aptitude. Self-report measures and the vocabulary test will be conducted again on January and June. This group will be compared to students who go to after school programs. To investigate if the values gained through Taekwondo reinforce emotional regulation, the group will also be compared to students who attend any music class. We hypothesize that if Taekwondo instills emotional regulation strategies to the children through practice over time in the classroom, this can be generalized and applied in school and enhance their academic performance.

C5  Differences in the emotional depths of first and second languages in bilinguals
Room: ECHA 1-167
K. Y. Huang & E. Nicoladis (Psychology Department, University of Alberta)

People are more willing to kill in thought experiments when using their second language. Bilingual speakers often experience greater depth of emotion in one language over the other. Studies have found that the first language is usually more emotional than the second. However, in most of these studies, participants were more proficient in their first language, suggesting possible confounding effects of proficiency and first language. We have hypothesized that proficiency might be a better predictor of emotionality, because
proficiency reflects more experiences with emotions in that language. The goal of the present research is to determine whether first language or proficiency is more important in evoking the emotionality of a language.

We will recruit English-French and French-English bilinguals, who will report their ages of acquisition (AOAs) and be assessed on their proficiency in each language. To measure emotionality, in each language, participants will say words, some positive, like “love”, and some negative, like “death”. At the same time, their skin conductance will be measured through the galvanic skin response (GSR). We hypothesize that proficiency will be a better predictor of increasing skin conductance in response to emotionally arousing stimuli. This result would be in line with our argument that more experiences of emotion in a language increases its emotionality.

C6 Communication accommodation theory in Lebanon
Room: ECHA 1-153
Wajed Nadine El-Halabi (Psychology Department, University of Alberta)

Communication accommodation refers to a phenomenon in which individuals either adapt to the communication styles of others in order to reduce social differences or accentuate the communication differences between themselves and others (Giles, 2016). This process has been observed in many different parts of the world; however, it has yet to be studied within the Lebanese population where many dialects of Arabic exist between different regions and between different religious groups. I will be traveling to Lebanon to study whether these phenomena can be observed within the Lebanese population. With the help of the American University of Beirut, we will be recruiting volunteers from various religions and regions of the country to observe their social interactions with each other. The results from this study could provide insight into the communication styles of a diverse population with a long and complex history. If communication accommodation theory can be observed in Lebanon, we may be presented with an opportunity in the future to further study this theory and the reasons that the Lebanese may have for their communication behavior.

C7 Intergroup Processes and the Relationship Between Subgroup Identity Threat and Leadership Rhetoric
Room: ECHA 1-163
M. P. Gawalko, Y. Ouyang, & D. E. Rast III (Psychology Department, University of Alberta)

In a society where teamwork and group collaboration are constantly encouraged, a common misconception is that dissolving boundaries will improve the interactions between two groups when, in fact, intergroup relationships are much more complex. Our study draws on intergroup leadership theory which states that promoting an intergroup relational identity, one in which self-concept is based on the relationship between two or more groups, is integral in maintaining optimal intergroup relationships (Hogg, van Knippenberg & Rast, 2012; Rast, Hogg & van Knippenberg, in press). This study is part of a larger set of studies on intergroup leadership in which we investigated the relationship between subgroup identity threat and leadership rhetoric. In the present study (N = 125), identity threat was manipulated by presenting participants with false feedback comparing Psychology and Business students. Psychology and Business students were either described as being very similar to (high threat) or different from (low threat) one another. We then randomly assigned participants to read a vignette from a student leader who promoted an intergroup relational identity or collective identity. That is, the leader emphasized keeping subgroup identities separate or consolidating them into a superordinate category. As expected, we found when identity distinctiveness threat is high, participants evaluated a leader who promotes an intergroup relational identity more favorably than a leader promoting a collective identity. This research shows that promoting a collective identity during a subgroup threat, which is quite common during intergroup interactions, will backfire.
Alexithymia is a personality construct representing deficits in experiencing and expressing emotions. People with this trait often have more difficulties in objective emotion processing task such as understanding facial expressions. Very few studies have examined attentional patterns underlying problems with understanding facial emotions. We recently found that although alexithymic individuals were able to accurately judge emotional face expression, attention to eye area was reduced in alexithymics. Normally a useful strategy in understanding facial emotions, alexithymics’ eye-attention did not help but instead decreased their understanding of facial emotions. The clarity of the emotional expression played no role in this behaviour. The current study again compares participants with high or low alexithymia (assessed with the TAS-20 questionnaire) in their accuracy judging facial emotions by estimating the mixture-ratio of two emotional expressions. One emotion in the mixture is always anger, blended with either disgust, fear, happiness, neutral, sadness. The focus on anger (a clear social-emotional threat) intends to probe attention avoidance more effectively than the previous study. Eye-tracking recordings are also recorded to determine whether the attentional eye-avoidance patterns persist. Based on the previous study, we hypothesize that the presence and amount of anger will have more effectively decrease judgement accuracy. We also expect to replicate eye-avoidance. Visual search behaviors will additionally be explored and may be compensatory in high alexithymics.

Café Session 2 (2:30 - 2:45 PM and 2:45 - 3:00 PM)

C9 Risk-factor analysis: Differentiating between violent and non-violent offending in adolescence
Room: ECHA 1-163
A. McIvor, R. Frenzel & C. Westbury (Psychology, University of Alberta)

Adolescent crime rates have been found to be higher than any other age-group. This may not be surprising given that adolescence is a transition period towards lower supervision and great personal development but it is concerning. Of greatest public concern surrounding adolescent criminal behaviour is that in the form of violence. Being able to identify the level of risk associated with a certain individual and their particular intervention needs is therefore critical. As such, the need for testing and improving risk-assessment instruments is necessary to ensure that accuracy is at its highest potential. The Structured Assessment of Violence Risk in Youth (SAVRY) is a well known, highly used assessment by professionals in the field of forensic psychology. The SAVRY was specifically designed to assess the likelihood of violent offending in youth, but studies have shown that it is equally sufficient at assessing the risk of nonviolent offenses. There is little knowledge behind why this is the case. Increasing the knowledge behind the predictive qualities of the different sections of the SAVRY could lead to advances in risk assessment designs. This information could result in better understanding behind risk factors present for youth offenders and help predict the likelihood and type of possible recidivism. If certain factors are shown to be more important for estimating risk across violent and non-violent offender groups this could be utilized to guide the weight placed on certain factors in risk assessments leading to the optimization of case management and intervention programs.

C10 Double labeling of immediate early gene expression in response to songs and calls in Zebra Finches (Taeniopygia guttata).
Room: ECHA 1-163
Juliana Montoya Sanchez, Erin N. Scully, Christopher B. Sturdy

Zebra finches (Taeniopygia guttata) are a well studied model species, in part due to their complex vocalizations and well-studied neural structures. Previous research has found that neurons in the auditory
nuclei caudomedial nidopallium (NCM) and caudomedial mesopallium (CMM) produce high levels of the immediate early gene zenk, and the protein product ZENK, in response to auditory stimuli. Our current study will observe if ZENK expression in the zebra finch auditory system is impacted by exposure to auditory songs and calls at a cellular level. We hypothesize that the neurons involved in the processing of calls are also involved in the processing of songs. By using fluorescent markers for both zenk and ZENK, we will be able to visualize which cells respond to songs, calls, or both songs and calls. Thus, this study will further explain how songbird vocalizations are processed on a cellular level in the auditory nuclei within the songbird brain.

C11 Red vs. Blue: How nonapeptides influence behavioural variation between Pelvicachromis pulcher colour morphologies
Room: ECHA 1-152
Z. Kruschke (Psychology Department), B. Hope (Neuroscience and Mental Health Institute) & P. Hurd (Psychology Department, University of Alberta)

Many species in the animal kingdom use various reproduction strategies, employing a wide variety of courtship behaviours. In cichlid fish, territorial males typically recruit females to their spawning sites, potentially adopting a harem. Non-territorial males may utilize other strategies such as mimicry and satellite spawning. Researchers have found that colour polymorphisms exist within Kribensis cichlids (Pelvicachromis pulcher) that are associated with different reproductive strategies. Our current study will be a correlational study analyzing behavioural and nonapeptide differences between blue and red male kribensis to find additional support for the possibility of other colour morphs existing than the already well-documented red and yellow morphs. In addition to running open field, plus maze, and mirror aggression behavioural tests, we will examine preoptic neurons for expression of the nonapeptides oxytocin and vasotocin. We hypothesize that there will be consistent differences in how red and blue kribensis explore new territory and defend their territory, and that these differences will be reflected in the prevalence of brain nonapeptides. This research will contribute to existing work on polymorphic intraspecies differences by providing internal and external evidence of colour polymorphisms in the Kribensis cichlid.

C12 Stigma or identity threat? An exploratory investigation into factors contributing to the formation of sexual orientation obsessive-compulsive disorder
Room: ECHA 1-153
C. Lindeman & P. Hurd (Psychology Department, University of Alberta)

Sexual orientation obsessive-compulsive disorder (SO-OCD) is an understudied and distressing condition. SO-OCD is characterized by obsessions and repetitive behaviours around thoughts, feelings, or impulses that an individual experiences towards a member of a sex that is not in accordance with that individual's preferred sexual orientation. In this exploratory study, we aim to investigate underlying factors contributing to the formation of SO-OCD. A sample of psychology undergraduate students will be administered a series of questionnaires that examine the presence of obsessive-compulsive disorder and SO-OCD, their sexual behaviours, and other variables that we hypothesize are contributing to the formation of SO-OCD. Factors being analyzed include perceived parental attitudes surrounding sexual orientation, the importance of sexual orientation to one's identity, self-esteem, mental contamination, and sexual arousal sensitivity. We expect that stigma around certain sexual orientations will not be a significant factor present in individuals from a non-clinical sample who scored higher on an SO-OCD scale, while all other factors will be significantly found within these individuals. The significant existence of certain factors could suggest that they are contributing to the emergence and perpetuation of SO-OCD. This knowledge may aid in clinical therapies for individuals experiencing SO-OCD, as it is often misdiagnosed. Increased awareness of contributing factors could aid in the identification and treatment of this distressing disorder.
Where are you really from?: Identity denial and discrimination as implications of reflected appraisals for second generation immigrants

Room: ECHA 1-153

P. Phiri & K. A. Noels (Psychology Department, University of Alberta)

An individual’s self-concept develops out of reconciling one’s self-appraisal with the reflected appraisals from significant others (Mead, 1934; Cooley, 1902). If both appraisals are not aligned, feelings of discrimination can arise as one feels like there is a limitation in the identity they can claim. This study replicates and extends Noels, Clément, and Leavitt’s (2008) study on how reflected appraisals contribute to feelings of discrimination for second-generation Chinese Canadians. Research shows that South Asians and Blacks rank as the lowest groups among immigrants in a national Canadian survey expressing preferences (Barry & Kalin, 1995), therefore it will be important to observe if the effects of reflected appraisals are experienced similarly for both groups. Through an examination of Black Canadians, this study investigates why the second-generation is particularly vulnerable in identity gaps, exploring the theory of identity denial (Wang, Minervino & Cheryan, 2012). Our hypothesis posits that G2 (compared to G1) immigrants expect to be treated equally due to having assimilated to the mainstream cultural identity so strongly that they may have self-stereotyped themselves to be prototypical ‘Canadian’. Another component of this theory is centrality, the value of in-group membership and the level of investment in it. The current study will assess the actual and reflected ethnic identities of 200 G1 and 200 G2 Black Canadians across 4 situational domains, (family, friends, university, community), their feelings of discrimination, and the individual self-stereotyping or centrality component. Using analyses of variance to compare the discrepancy scores across the 4 situations and 2 generations, and using mediation analyses we will examine whether individual self-stereotyping or centrality can account for the relation between the identity gap and perceived discrimination. The discussion outlines the role of the other in shaping identity and how its importance is weighted differently for the immigrant generational groups.

FOURTH YEARS’ BLITZ TALKS

3:00 - 4:00 PM | Room: ECHA 2-140

Fourth-year honours students have 3 minutes to present the key elements of their research, detailed fully in the subsequent poster session. See the Showcase Poster Presentations section below for abstracts and more details.

Blitz Talk 1 (Showcase Poster: P1)

Empathy and compassion’s effect on the resolution of the requirements of mourning

Daniel Ennett

Supervisor(s): Dr. Takahiko Masuda

Blitz Talk 2 (Showcase Poster: P2)

The Influence of Reference Frame on Spatiotemporal Metaphor Comprehension

C. Y. Agyemang

Supervisor(s): Dr. Christina Gagne and Dr. Thomas Spalding
Blitz Talk 3 (Showcase Poster: P3)
I hear, therefore I perceive: Effects of speech accent on perception of physicians
C. L. C. Baquiran
Supervisor(s): Dr. Elena Nicoladis

Blitz Talk 4 (Showcase Poster: P4)
The Effects of Self-Construal and Gender Role Identification on Social Anxiety across Cultures
B. S. Hoy
Supervisor(s): Dr. Takahiko Masuda

Blitz Talk 5 (Showcase Poster: P5)
What is the Relationship Between Alexithymia and Schizotypy in a Non-Clinical Population?
Ashley Huang
Supervisor(s): Dr. Peter Hurd

Blitz Talk 6 (Showcase Poster: P6)
The effects of uncertainty on perceptions of competence and support for male and female leaders
M. Kaczmar
Supervisor(s): Dr. David Rast

Blitz Talk 7 (Showcase Poster: P7)
The safety and efficacy of arginine-rich polypeptide R18D following intracerebral hemorrhage
Lane Liddle
Supervisor(s): Dr. Fred Colbourne

Blitz Talk 8 (Showcase Poster: P8)
Narratorial attitude can reduce the consistency effect
C. Linden
Supervisor(s): Dr. Peter Dixon

Blitz Talk 9 (Showcase Poster: P9)
Identification with Extremist Groups: How Important Is Entitativity?
Angela C. Ma
Supervisor(s): Dr. David Rast

Blitz Talk 10 (Showcase Poster: P10)
Focal object size and attention patterns between Western and East Asian cultures
R. Mahdi
Supervisor(s): Dr. Takahiko Masuda

Blitz Talk 11 (Showcase Poster: P11)
Language Use and Situated Ethnic Identity
Jayasree Narayanan
Supervisor(s): Dr. Kimberly Noels

Blitz Talk 12 (Showcase Poster: P12)
School Climate and Adolescent Internalizing Problems
T. J. L. Pidner
Supervisor(s): Dr. Wendy Hoglund
Blitz Talk 13 (Showcase Poster: P13)
*Sexual Orientation and Peer Victimization in Adolescence*
Devyn Rorem
Supervisor(s): Dr. Wendy Hoglund

Blitz Talk 14 (Showcase Poster: P14)
*Children’s development of musical constructions and learnt affective meaning*
R. S. A. Stuber
Supervisor(s): Dr. Elena Nicoladis

Blitz Talk 15 (Showcase Poster: P15)
*The Effect of Relative Rank Feedback on Risky Decision-Making*
V. Tran
Supervisor(s): Dr. Marcia Spetch

Blitz Talk 16 (Showcase Poster: P16)
*Looking at the association between inhibitory control, math, and literacy skills in childhood.*
M. Warren
Supervisor(s): Dr. Sanda Wiebe

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**UNDERGRADUATE RESEARCH SHOWCASE:**

**Poster Presentations**

**P1  Empathy and compassion’s effect on the resolution of the requirements of mourning**
Daniel Ennett (Culture and Cognition Lab, Psychology Department, University of Alberta), Takahiko Masuda (Culture and Cognition Lab, Psychology Department, University of Alberta), Nigel Mantou Lou (Intercultural Communication Lab, Psychology Department, University of Alberta).

The requirement of mourning framework suggests three ways people resolve discrepancy between expected suffering and perceived suffering: empathetic, self-aggrandizing and ought. It suggests the empathetic requirement is the only way for people to revise their expectations. I will investigate how perspective taking in empathy and compassion (a purportedly more sustainable and efficient alternative) inductions affect participants’ perception of a spinal cord injured (SCI) individual’s mood, the traits assigned to the SCI individual using an inventory that measures dehumanization, and how participants rate physical disability within the stereotype content model (SCM). Participants undergo a neutral, empathy, or compassion induction through written instructions. Next, after listening to a mock clinical interview between a SCI individual and a psychologist, participants will complete the personality questionnaire for SCI individuals rating how they thought the SCI individual responded. Next, participants will complete the SCM in relation to physical disability, a dehumanization trait assessment, and the positive and negative affect scale (PANAS-X). I hypothesize that the empathy and compassion inductions should (1) result in lower ratings of negative affect in perceived SCI individual, (2) result in higher competence ratings in the SCM. (3) Compassion should show significantly lower perceived negative affect and higher competence ratings in comparison to empathy and (4) compassion should not lead to false veneration (inspiration measured with subscale on SCM). (5) Scores on the dehumanization inventory are largely exploratory. (6) PANAS-X scores for
the compassion condition should show more neutral affect in the participant than the other conditions.

**P2 The Influence of Reference Frame on Spatiotemporal Metaphor Comprehension**

*C. Y. Agyemang (Psychology Department, University of Alberta), C. L. Gagné (Psychology Department, University of Alberta), T. L. Spalding (Psychology Department, University of Alberta)*

Events sequenced in time are often figuratively described using spatial language (e.g., the meeting was pushed forward two days). The domain mapping hypothesis (Gentner, 1992) states, this occurs because temporal events are represented metaphorically using spatial information relevant to time. These spatiotemporal metaphors arguably use frames of reference, where the relative present is either specified (deictic) or is not (intrinsic) (e.g., Christmas is coming up but not before Halloween; Halloween comes before Christmas). Experiment 1 investigated the influence of reference frame on processing the metaphor. Specifically, whether switching the reference frame of a given spatiotemporal metaphor incurs a processing cost, and if so, whether the direction of the switch matters. Participants read a context that related events in time using a spatiotemporal metaphor, either presented deictically or intrinsically. Participants immediately answered a question using the same metaphor presented in context, also with a manipulated reference frame. When the context and the question were both intrinsic, responses were faster. However, when the context was deictic, responses to the intrinsic and deictic questions did not differ. This result suggests that intrinsic items have greater constraints on their subsequent comprehension. In Experiment 2, participants judged when the deictically or intrinsically described events occurred relative to the present. Responses did not differ between conditions. Post hoc analyses reveal that cultural items (e.g., spring) are responded to differently depending on when the event occurred relative to their present. Therefore, participants may make use of their relative present to situate events in time.

**P3 I hear, therefore I perceive: Effects of speech accent on perception of physicians**

*C. L. C. Baquiran & E. Nicoladis (Psychology Department, University of Alberta)*

People sometimes assume that a person who speaks with a foreign accent possesses negative traits and personality characteristics. The purpose of this study is to test if doctors who speak with a foreign accent are perceived as less competent than doctors who speak with a standard accent. We asked both Canadian and Chinese Canadian undergraduates to rate the competence of a doctor with either a standard Canadian accent or a Chinese accent. The doctor was delivering either good or bad news about the patient’s cholesterol levels or cancer. Previous research has shown that when reminded of death, participants favour in-group members (Solomon, Greenberg, & Pyszczynski, 1991). We therefore predicted that the Chinese-accented doctor is more likely to be judged positively by Chinese Canadian participants when given bad news about cancer. Similarly, the standard-accented doctor is more likely to be favourably perceived by Canadian participants in the same condition. The initial results suggest that, as predicted, the accent affects participants’ judgments of the doctors’ competence.

**P4 The Effects of Self-Construal and Gender Role Identification on Social Anxiety across Cultures**

*B. S. Hoy & H. Lee (Psychology Department, University of Alberta)*

The prevalence of social anxiety experiences has been found to differ as East Asians and women in general are more susceptible to experience social anxiety compared to other populations (Kessler et al., 1994; Okazaki, 1997). This study attempted to investigate these differences in susceptibility by examining the roles of self-construal, gender role identification in a person’s susceptibility to social anxiety. One hundred European Canadian and 100 East Asian Canadian undergraduate students from the University of Alberta were asked to complete several online questionnaires assessing their levels of interdependence (Singelis 1994) and their gender role identification (Bem, 1981). We hypothesized that culture would influence self-construal and gender role identification and that these cultural effects would be responsible for individual
differences in social anxiety experiences. We expect to find significant differences in self-construal with East Asian Canadians and European Canadian women being more interdependent than European Canadian men. Similarly, we expect to find significant differences in gender role identification with East Asian Canadians and European Canadian women identifying more strongly with female gender roles compared to European Canadian men. Taken together, we expect to find a cultural interaction between self-construal and gender role identification, which will enable us to better understand individual differences in social anxiety experiences. Upon its completion, this study will further aid clinicians in identifying susceptible individuals across cultures.

Keywords: social anxiety, self-construal, gender role identification, culture

P5 What is the Relationship Between Alexithymia and Schizotypy in a Non-Clinical Population?
Ashley Huang, Peter Hurd

People who score highly on the schizotypy spectrum often have trouble expressing their feelings and communicating them to other people. This can negatively impact their ability to form lasting and healthy relationships. Past research has found a correlation between schizotypy scores and alexithymia, which is the inability to understand one's inner states and express them to other people. However, there has been little investigation of this relationship in non-clinical populations. New theories about schizophrenia are also emerging, which seek to differentiate the communication deficits of schizophrenia with those of the autistic spectrum. These two issues are addressed in the current study, which examines the correlations of alexithymia with both schizotypy and autism scores in a largely subclinical sample. We have administered the Toronto Alexithymia Questionnaire, the Schizotypy Personality Questionnaire- Brief Revised, and the Autism Spectrum Quotient to undergraduate students at the University of Alberta. If differences in correlations between schizotypic and autistic symptoms are found, this research will help discern the unique characteristics of communication deficits in schizophrenia and autism. Data analysis is currently underway.

P6 The effects of uncertainty on perceptions of competence and support for male and female leaders
M. Kaczmar & D. Rast (Psychology Department, University of Alberta)

Female leaders are vastly underrepresented in leadership positions. This is partially because there is a discrepancy between the role of a female and the role of a leader (Eagly & Karau, 2002); however, women are preferred as leaders when companies experience a financial crisis (Ryan & Haslam, 2005). Rast (2015) hypothesized that uncertainty is the moderating psychological variable to this ‘think crisis, think female’ paradigm (Ryan, Haslam, Hersby, & Bongiorno, 2011). The current study incorporated the social identity theory of leadership (Hogg & van Knippenberg, 2003), uncertainty-identity theory (Hogg, 2007) and the stereotype content model (Fiske, Cuddy, Glick, & Xu, 2002) to examine how uncertainty affects perceptions of competence and support for male and female leaders based on their prototypicality. Participants (N = 203) were primed with high or low uncertainty and read a statement from a prospective prototypical or non-prototypical student leader who is either male or female. Participants then evaluated the leader on their perceived competence and how much they would support this leader. Specifically, we anticipated that under high uncertainty, a non-prototypical female will be perceived as more competent and will gather more support than her male opponent. Counter to previous research, we found no significant differences in the perceptions and evaluations of male and female leaders. Results are discussed in terms of gender equality for leadership selection.

P7 The safety and efficacy of arginine-rich polypeptide R18D following intracerebral hemorrhage
Lane Liddle, Ryan Reinders, Cassandra Wilkinson, Fred Colbourne

Intracerebral hemorrhage (ICH) is a deadly stroke subtype, characterized by rupture of cerebral blood
vessels. Injury following ICH is biphasic, involving primary and secondary injury processes. In terms of primary injury, blood dissects through the brain, killing neurons and disrupting neuronal communication in its wake. Treatments aiming to reduce primary injury are difficult to implement because stroke onset is unpredictable. Consequently, more research is being done on reducing secondary injury processes. For example, blood breakdown products are toxic to neurons; it is hypothesized that brain injury may be reduced by surgically or chemically reducing the impact of these products. R18D is an arginine-rich polypeptide that has been shown to reduce brain injury following ischemic stroke and traumatic brain injury: two neurological conditions with similar secondary injury mechanisms. Accordingly, the aim of this study was twofold—first, to establish whether R18D is safe to administer following ICH. Second, to gather preliminary evidence towards the efficacy of R18D— that is, whether R18D conferred neuroprotection and/or behavioural benefit. For safety, we evaluated the amount of cerebral bleeding using a common biochemical assay 24 hours following experimental induction of striatal ICH using collagenase in rats. We found no significant differences in bleeding at multiple doses compared to controls. This assessment is paramount because the amount of cerebral bleeding predicts death and disability in patients. In terms of efficacy, we evaluated brain damage using a common histological lesion volume technique; for behavioural outcomes, we assessed walking and skilled-reaching: tests that are sensitive to striatal damage.

**P8 Narratorial attitude can reduce the consistency effect**  
*C. Linden & P. Dixon (Psychology Department, University of Alberta)*

We explore the role of a first-person narrator’s attitude on the consistency effect. The consistency effect is present when a sentence in a narrative contradicts information previously presented in the narrative, which leads to a coherence break and slows reading time as readers reconcile the narrative’s inconsistency. Prior research has suggested that the consistency effect is the result of rote memory processes, however we suggest that the narrator’s attitude can influence the consistency effect. We demonstrate that when a narrator is skeptical of the initial claim the inconsistency is easier for readers to reconcile. The narrator’s skepticism reduces the consistency effect and makes the inconsistent information more comprehensible for readers. We argue that this belies the notion that the consistency effect is the result of rote memory processes. Instead, we suggest the reader looks to the narrator to draw their attention to the most relevant aspects of the narrative.

**P9 Identification with Extremist Groups: How Important Is Entitativity?**  
*Angela C. Ma, David E. Rast III (Psychology Department, University of Alberta), Amber M. Gaffney (Psychology Department, Humboldt State University)*

Research on group identification has long found that when individuals feel uncertain about themselves and their place in the world, they are more likely to identify with extremist groups (Hogg, Meehan, Farquharson, 2010; Hogg & Adelman, 2013). Uncertainty identity theory states that highly entitative groups are more effective at reducing feelings of uncertainty because they possess clearly defined group prototypes, offering their members an unambiguous guide on how to behave (Hogg, 2014). Entitativity is a quality possessed by many extremist groups (Hogg & Adelman, 2013), which raises the question of whether it could be high group cohesion, rather than extremist ideology, that draws uncertain individuals. Our study attempts to answer this question by orthogonally manipulating group extremism and entitativity, using a novel image-based manipulation for group entitativity. Results show that group identification is highest when the group is highly entitative and moderate. Comparable levels of identification were found for all other experimental conditions. Further testing is needed to determine whether this effect holds under uncertainty.

Are uncertain individuals drawn to extremist groups by ideology or entitative group structure? The current study tries to answer this question by orthogonally manipulating group extremism and entitativity. Results show that identification is strongest with highly entitative moderate groups. More research is needed to
determine if this effects holds under high uncertainty.

**P10  Focal object size and attention patterns between Western and East Asian cultures.**
R. Mahdi (Department of Psychology, University of Alberta), K. Ishii (Department of Psychology, Kobe University), T. Masuda (Department of Psychology, University of Alberta)

Westerners’ attention patterns tend to be more object oriented, focusing on foreground objects and analyzing them separately from other objects, whereas East Asians’ attention patterns tent to be context oriented, drawing on relationships between objects and their context. We tested if the focal object size has an effect on the attention patterns between Western and East Asian participants. Canadian from the University of Alberta and Japanese participants from Kobe University observed images of sport activities where the main focal character was either large or small. During this task, their attention to the scene was recorded using an eye-tracker. The number of fixations made and the duration of the time focusing to either the focal object or the background were measured and compared. Statistical analysis replicates previous findings of an interaction between culture and attention patterns to the background. However, it was found that size has no significant three-way interaction with duration. Additionally, fixation data did not find a 2x2 interaction when comparing culture and size however a strong three-way interaction was observed with the number of fixations made. This means that although size does not matter when considering duration, size does seem to have a strong interaction with culture and focal area only when considering the number of fixations.

**P11  Language Use and Situated Ethnic Identity In Singapore**
Jayasree Narayanan, Kimberly A. Noels

Previous research indicates that greater usage and proficiency of a language is often positively correlated with a stronger identity in relation to that language. This study examined how the social situation impacts the relationship between language use and identity patterns of Singaporeans of different ethnic backgrounds. Singaporean participants from the Chinese, Malay and Indian ethnic groups (n = 103) completed an online questionnaire that consisted measures of identity and language use across family, friends, work, school and community domains. We ran a set of pairwise t-tests to examine the mean differences in the Singaporean and heritage identities within each situation. A Bonferroni correction was used to adjust significance level to prevent type I error. For Chinese participants there was a significant difference between their ethnic and Singaporean identities in all situations except for the family domain. For Malay participants, a significant difference was found only in the community domain. These findings imply that the differences between the groups could be due to the indigenous status of Malay Singaporeans. We conducted correlational analyses to evaluate the associations between identity and language use of participants in their heritage language and English in each situation. For most participants there were no correlations between the usage of their heritage language and ethnic identity across most situations. Using English was positively correlated with their Singaporean identity in the school situation for Malay participants. Overall, the results indicate that, the differences found among the ethnic groups could be due to perceived social status differences among ethnic groups.
Keywords: language use, ethnic identity, Singaporean identity

**P12  School Climate and Adolescent Internalizing Problems**
T. J. L. Pidner, S. John, W. L. G. Hoglund

Adolescence is a critical developmental period for the experience of internalizing problems. Clinical levels of internalizing problems, which include symptoms of anxiety and depression, are experienced by up to 30% of individuals at some point during adolescence. Adolescents also spend the majority of their time in the school setting, and their perceptions of characteristics such as the safety of this environment may
have important implications for their experience of internalizing problems. Such perceptions reflect school climate, which may be unique to each adolescent, or may be a shared experience across all adolescents within a school. When individual adolescents perceive their school to be safe and free of bullying, and this is also the general consensus across all adolescents in the school, they may also experience fewer internalizing problems. When individual adolescents’ perceptions of their school climate differ from the general consensus among adolescents in the school, the implication for adolescent internalizing problems is less clear. The purpose of this study was to investigate (1) the frequency of and change in internalizing problems across two school years and (2) to examine how individual and aggregate perceptions of the school climate predict the frequency of adolescent internalizing problems. Participants included 1,775 adolescents in grades 7 to 9, who were assessed via a questionnaire in the fall and spring of two school. By improving our understanding of the trajectory of adolescent internalizing problems, especially in relation to differential perceptions of school climate, this study will inform effective school-wide preventative interventions targeting them.

P13 Sexual Orientation and Peer Victimization in Adolescence
Devyn Rorem, Saira John, Wendy Hoglund

Adolescence is a developmentally important period for peer relationships and self-discovery. During adolescence, many adolescents experience victimization by peers. It is also when adolescents may begin to question their own sexual orientation. Peer victimization can take on many forms, including physical, relational, cyber, and homophobic victimization subtypes. Prior research has indicated that sexual minority adolescents, those that identify with a sexual orientation other than heterosexual, experience higher frequencies of peer victimization compared to their heterosexual peers. However, it is unclear whether the frequencies and rates of change of the four subtypes of peer victimization differ between sexual minority and heterosexual adolescents. The purpose of the current study is to investigate if the frequency and rates of change of physical, relational, cyber, and homophobic subtypes of peer victimization differ between heterosexual and sexual minority adolescents. Participants included 1434 adolescents from junior high schools in grades 7, 8, and 9. These same adolescents were followed over two academic school years and completed surveys on four occasions. Data were collected in Fall 2014, Spring 2015, Fall 2015, Spring 2016. Youth self-reported on their sexuality and on their experiences of these four subtypes of peer victimization. This study will add to the understanding of the peer victimization experiences of sexual minority adolescents.

P14 “This is a Titanic Song”: How Children Learn Emotions in Music Through Familiarity
R. Stuber & E. Nicoladis (Psychology Department, University of Alberta

Music carries an emotional meaning that is relayed through musical elements such as mode, rhythm, and tempo. Previous research has found differences between children, ages 4-years and younger, and adults in their understanding of music's affective meaning. Through the analogy of language to music, an understanding of emotion in music can be analyzed through children's understanding of musical concepts. The usage-based theory of language suggests that differences in understanding are due to the fact that meaning is learnt through familiarity, and states that language is learnt through the gradual generalization of linguistic schemas based on frequency of exposure. This research studied if children's previous experience to music in movies affects their understanding of music's emotional meaning. Data were collected from 39 4- to 5-year-old children, and coded for familiarity. The children each saw 18 musical segments, 6 for three emotions (i.e. anger, sadness, happiness), and their accuracy was measured. Both the age of the children, and their familiarity with the piece, were positive significant predictors of their accuracy. This research proposes that the connection between emotions and music is learnt through exposure, suggesting that understanding emotion in music is not innate, but learnt over time and with experience.
P15  The Effect of Relative Rank Feedback on Risky Decision-Making
V. Tran & M. L. Spetch (Psychology Department, University of Alberta)

Rank is often what differentiates the winners from the losers, therefore individuals are typically more concerned about their relative performance in a group rather than their absolute performance. However, little is known about how providing relative rank feedback will affect risky decision-making. This study aimed to determine whether feedback about how an individual is performing relative to others affects their proportion of risky choices. Participants performed an experience-based risky decision-making task on the computer. Some choices were between options that lead to outcomes of different values, so that learning to choose the higher valued options will lead to higher scores. Other choices were between options that have the same overall expected value but differ in risk. Participants were randomly assigned to either the control or the feedback group. Half way through the task, individuals in the feedback group received feedback indicating whether they were above or below average based on their performance. I hypothesized that the feedback group will score higher in their post-feedback performance than the control group since their feedback will provide them with a reference about their relative rank. I also hypothesized that participants who receive feedback that they are below-average group will be more risk-seeking, and participants who receive feedback that they are above-average group will be more risk-averse compared to the no-feedback control group. Preliminary results do not support these hypotheses. Instead feedback appeared to have little effect on risk preference or overall performance.

P16  Looking at the association between inhibitory control, math, and literacy skills in childhood

Inhibitory control (IC) is the ability to control one's behaviour, thoughts, and emotions to inhibit an existing prepotent response (Diamond, 2013). IC has been shown to be an important factor in determining children's success going into their school years. Blair and Razza (2007) found that IC predicted math and literacy in preschool children transitioning to their first year of kindergarten. The current study aims to replicate these results with different measures of IC, reading, and math. Participants were children initially aged 4 through 6 who completed two waves of data collection separated by twelve months. IC measures included the Flanker, Simon, and Go/No-Go tasks and reading and math measures included the Passage Comprehension, Letter-Word Recognition, and Applied Problems subtests of the Woodcock Johnson III Test of Achievement. IC measures at wave one were used in predicting the reading and math scores at wave two. A linear regression analysis showed that Flanker task performance significantly predicted scores on the Passage Comprehension and Letter Word Recognition subtests. However, the other IC measures were not significant predictors and no significant relationship was found with the Applied Problems subtest scores. These results support IC as a potential predictor for later reading skills for children beginning elementary school, however, further investigation is required for looking at the association of IC and math.

P17  A two year retrospective analysis: Why are our veterans falling?
V. Tran (Psychology Department, University of Alberta)

Background: Fall-related injuries are a major health concern in the growing older population. Approximately 5-10% of all falls results in either major injuries or death. The objectives of this study were 1) to provide staff at a long-term care (LTC) facility insight into the rates of falls at their facility and 2) guide future fall management strategies and interventions.

Methods: This study focuses on residents admitted to the LTC facility from October 1, 2014 to September 30, 2016. The final sample consisted of 158 residents. Data was collected retrospectively using incident reports, an electronic health records system, and resident charts. Some variables collected include: residents’ length of stay, time of fall, location of fall, and injury type.
Results: 355 falls occurred during the study period. Approximately 10% of falls resulted in a head injury or a major injury. In addition, a large proportion of falls occurred during shift changes, evening shifts, as well as in resident rooms and dining rooms. Moreover, 50% of falls occur during the first 75 days upon a resident's admission, allowing for targeted interventions in the future.

Discussion: Although the frequency of falls is high at this site, the proportion of falls with injury and falls without injury are consistent with previous research. Based on the results of this study, several factors can be targeted as parts of a new falls management strategy. Currently, this LTC site is focusing on the interventions during the admission process and strength training exercises to help prevent future falls.

P18 Effects of sex and sport participation on mental rotation and movement imagery ability
B. Diduck (Psychology Department, Concordia University of Edmonton) & Y. J. Wong (Psychology Department, Concordia University of Edmonton)

A well-established male advantage is found in mental rotation (MR) ability, however, it remains unclear whether sex differences are influenced by biological or environmental factors. This research examines the effects of sport participation on MR ability and movement imagery (MI) ability in male and female athletes and non-athletes. To measure MR ability, three-dimensional cube figures were presented as either pairwise or multiple choice questions. Participants determined if the figure(s) were either rotated or mirror images of a target figure. MI ability was measured using an established objective test of movement ability (TAMI). As predicted, athletes outperformed non-athletes on all measures, and males demonstrated greater multiple choice MR ability. Interestingly, pairwise MR produced no sex differences. When only athlete scores were included, no sex difference was found in multiple choice MR ability, demonstrating that sport participation mediates female performance on multiple choice MR. This supports the notion that (1) pairwise and multiple choice questions have different task demands (working memory, eye movement) and may implicate different cognitive processes that produce sex differences, (2) in females, environmental factors such as sport participation positively impact cognitive processes implicated in MR multiple choice ability. Given that athletes demonstrated greater MR and MI ability, and that MR and MI are fundamentally relevant for STEM disciplines, elucidating the relationship between sport participation, sex, and MR and MI ability could help improve educational standards and understand the sex disparities in the STEM field.

P19 Parents point more when bilingual children’s language skills are weak
Shania Horn, Elena Nicoladis, & Diane Poulin-Dubois (Psychology Department, University of Alberta; Psychology Department, Concordia University)

While speaking to infants and toddlers learning their first language, parents often point to objects or events in the world related to what they are saying. Parents’ pointing can therefore help young children understand the meaning of their speech, thereby helping children acquire language. The purpose of the present study was to test whether parents of bilingual preschoolers would point more when speaking their children’s weaker language. Eighteen French-English bilingual children and their parents participated in this study. Each child participated in two free-play sessions with parents, one in each language. The results showed that the lower the children’s vocabulary scores in English and French, the more pointing gestures the parents produced when speaking that language. We argue that parents point to help scaffold language development for bilingual children’s weaker language.

P20 Abstract Representation of Passives in Young Bilingual Children
Sera Sajeev and Elena Nicoladis (Department of Psychology, University of Alberta)

Young children make errors in interpreting passive sentences (like Chris was seen by Pat), usually assuming that the subject of the sentence was also the agent of the action (e.g., Chris was doing the seeing in the
example sentence). As they get older and gain greater language skills, children demonstrate abstract representations of passive sentences: for example, bilingual children show cross-linguistic priming in the use of passives. The purpose of this study was to test whether cognitive development (as indexed by age), language development (vocabulary scores) was more important for an abstract representation of passives. French-English bilingual children, between the ages of 3 and 6 (mean =4;6) participated in this study. Children were given standardized English and French vocabulary tests. They were also asked to interpret passive sentences in both French and English (word-for-word translations). Children's abstract knowledge of passives was measured 1) by calculating the absolute difference of the ratio of passives correct between the two languages and 2) by calculating the percentage correct on the same items in French and English. The children's ability to comprehend passives was predicted better by their age than by their vocabulary scores in either language. The results suggest that cognitive development is important in children's development of an abstract representation of passives. We discuss some possible cognitive skills that might underlie this development.

**P21 How can I succeed in a second language course? Motivation as a predictor of grades in second language courses**

* Maria Choi, Coleen Eiman, Khadija Malik, Tehseenah Zahrah, Poliana Barbosa, Catherine Zoleta, Elena Nicoladis (Psychology Department, University of Alberta)

In multiple studies, high intrinsic motivation (IM) predicts positive academic results in second language (L2) courses, regardless of the L2 being learned (Yusuf et al., 2015). In the current study, we investigated if IM, compared to extrinsic motivation (EM) and amotivation (AMOT), is a better predictor of the scores on a standardized vocabulary test and the grades that adult L2 learners achieve. Using the Language Learning Orientations Scale (Noels et al., 2000), we measured the motivation of UAlberta students (N=10) in introductory French and Spanish courses, and analyzed whether there was a relationship between their motivation and 1) grades 2) vocabulary scores. Individual motivation types (IM, EM, AMOT) and subtypes, as well as total motivation (all motivation types and subtypes combined), did not show a statistically significant correlation with vocabulary scores. When we examined individual motivation scores, IM and two subtypes of EM (introjected regulation and integrated regulation) each had a statistically significant positive correlation with grades. Of the three, IM most strongly correlated with grades. These correlational analyses support our hypothesis that IM is a better predictor of grades than the total amount of motivation, and the individual motivation subtypes. These results suggest that the grading system currently used in undergraduate L2 classes reflects student motivation more than L2 proficiency. However, due to a small sample size, further research is necessary to explore the relationship between motivation and L2 assessment measures, such as vocabulary scores and grades.

**P22 Bilinguals Select Easy-to-Access Words on a Semantic Verbal Fluency Task**

* Olusegun Akinniyi, Aiman Khan, and Elena Nicoladis (Psychology Department, University of Alberta)

Bilinguals have a harder time accessing target words on picture-naming tasks for production than monolinguals. And yet some studies have shown that bilinguals can produce just as many valid words on a verbal semantic fluency task as monolinguals. In the present study, we tested whether bilinguals strategically produce words that are easy to access on a verbal semantic fluency tasks. We operationalized ease of access in three ways: 1) input frequency, 2) the set of items generated in each language, and 3) cognates. Fifty-seven French-English bilingual children between four and six years of age participated. On one occasion in French and once in English, they listed as many words as possible within 60 seconds from the three given categories: clothing, animals, and foods and drinks. We found a positive correlation between input frequency and the number of children who generated a particular item. Also, there was a high correlation between the number of children who produced each concept in English and in French (e.g. milk and lait). Finally, the most frequently produced words by bilinguals were often cognates (e.g., pants in
English and pantalons in French). These results are consistent with the argument that bilinguals produce easy-to-access words on a verbal semantic fluency task.

**P23** Cup or Mug: An ERP investigation of the effect of language on cognition  
*R. Mancuso, J. E. M. Scanlon, T. Masuda, K. E. Mathewson (Psychology Department, University of Alberta)*

The Sapir-Whorf hypothesis states that the language you speak affects the way you view the world around you. English and Mandarin were chosen to be studied in this experiment as they are two of the most frequently spoken languages in Canada. In this study, EEG was used to record brain activity of participants that either spoke English or Mandarin while they sat in a soundproof chamber. In English, there are multiple words to describe a drinking vessel, such as cup and mug, but there is only one such word in Mandarin. We wondered if this led English speakers to categorize cup and mug differently. To test this, participants were instructed in their native language to perform a visual oddball task in which three objects were presented; a cup, a mug, and a bowl. The participants were told to pay attention to all of the objects, but only respond to the bowl. The standard stimulus, a cup was presented with a high local probability of 80%, the deviant stimulus (a mug) was presented with a low local probability of 15%, and the bowl was presented only 5% of the time. As English has multiple words to describe a drinking vessel, compared to Mandarin which only has one word, it is predicted that English speakers would display a greater difference in brain activity when viewing the deviant stimulus compared to Mandarin speakers based solely on the language they speak.

**P24** Bilingual and monolingual children use the mutual exclusivity principle to learn new words  
*Julia Wood & Elena Nicoladis (Psychology Department, University of Alberta)*

Children learn many new words over a few short years. To learn the meaning of new words so quickly, they might rely on some assumptions about potential meanings. For example, children might assume that new words cannot refer to objects that already have names; in other words, they assume that words are mutually exclusive. Bilingual children’s word learning might be less constrained by the mutual exclusivity principle (MEP), as bilingual children must violate the MEP to learn translation equivalents. Some previous studies have shown that bilingual children are more willing to choose a familiar object as a possible referent for a new word than monolinguals.

The purpose of the present study was to test whether bilingual children use the MEP less often than monolingual children. We considered two explanations for the difference: 1) bilinguals’ exposure to two languages and 2) bilinguals’ lower within-language vocabulary scores. Some previous studies have shown that younger children rely less on the MEP than older children.

We presented children (between 3 and 5 years) with 20 pairs of a familiar object (such as a tree) and an unfamiliar object (unnameable-by-adults objects). We asked them which one corresponded to a novel word (like “dax”). Children guided by the MEP should choose the unfamiliar object. The results showed that bilingual and monolingual children were equally likely to choose unfamiliar objects. The degree of this preference was correlated with their vocabulary scores. These results suggest that the MEP is learned as a result of increasing vocabulary.

**P25** Value biases in human memory and alexithymia  
*Courtney L. Stolz (Departments of Biology and Psychology, University of Alberta), Sucheta Chakravarty (Department of Psychology, University of Alberta), Esther Fujiwara (Department of Psychiatry, University of Alberta) and Jeremy B. Caplan (Department of Psychology, University of Alberta)*

Value is thought to enhance memory, yet most tasks confound learning with receiving reward. From such tasks, enhanced memory for a previously high-reward-associated item is indistinguishable from having
received a high reward to learn it. In a paradigm that equates usefulness for earning reward between words trained to have a high-value or low-value, explicit memory (free recall) was largely uninfluenced by value, but access-speed (lexical decision times) was faster for previously high- than low-value words. Later we found this value bias in access-speed was enhanced when images from the mobile game Candy Crush were used as feedback in place of the previous coin imagery, without changing the logic of the task. Here, we asked whether Candy Crush cues during value training may also lead to value-biases in free recall. A secondary question was whether alexithymia (a personality trait indicating difficulties with identifying and describing emotions) would modulate any potential value biases. Participants learned values (high versus low) through trial and error. Value biased free recall of the words, but only when Candy Crush cues were used as feedback, suggesting that they may provide additional motivation over the coin stimuli. Value biases were present in participants with probable or high alexithymia, suggesting people with alexithymia are more susceptible to superficial manipulation. In conclusion, game-based visual reward cues may increase people’s propensity to show irrational value-based implicit and explicit memory biases. Individuals reporting difficulties with identifying and describing emotions may be particularly vulnerable to reward-based memory biases.

**P26  Eye preference in speeded emotion recognition: alexithymia and eating disorders**

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Eating disorders (EDs) such as anorexia or bulimia affect up to one million Canadians. EDs are psychiatric conditions characterized by disordered eating, concerns over body weight and shape, and fear of weight gain. Social-emotional problems are common among EDs. Using eye-tracking, we recently observed that ED patients avoided looking at other people’s faces, especially their eye-region. Facial/eye-avoidance only emerged when expressions contained a small proportion of anger or disgust and therefore were difficult to judge. However, other studies reported faces with clearly visible disgust expressions may trigger ED-related problems most. Thus, we test here if our previous attentional findings generalize to a task using only clear emotional expressions (incl. anger and disgust). We also examined the role of comorbid alexithymia. A total of 33 patients from the UA Hospital Eating Disorder Program, and 66 non-ED controls (33 HA, 33 LA) were recruited. The speeded ‘odd-man-out’ task required participants to identify one face in a set of three that showed a different emotional expression. Eye-movements were recorded throughout the task. Patients were equally accurate but significantly slower, and they looked less at the faces or their eyes compared to LA (but not HA) controls. ED patients but neither of the control groups showed a high number of saccadic eye-movements when inspecting angry or disgust-expressions, a patterns also known as facial ‘hyperscanning’. Findings suggest an ED-specific, non-alexithymia-driven sensitivity to processing anger or disgust in others. Understanding and withstanding perceived anger or disgust/disapproval appears a valuable treatment target in EDs.

**P27 The effect of word imageability on the electrophysiological correlates of association-memory**

*Nicole L. Dittmann (Neuroscience and Mental Health Institute, University of Alberta), Hanna Warawa (Department of Psychology, University of Alberta), Yvonne Y. Chen (Baylor College of Medicine), & Jeremy B. Caplan (Neuroscience and Mental Health Institute, University of Alberta & Department of Psychology, University of Alberta)*

Participants remember associations between words better when they are high in imageability, a rating of how well a mental picture of a word can be formed. The cortical theta oscillation, rhythmic activity between 4 and 8 Hz, has been found to be more prominent while participants encode words that they successfully recalled in comparison to those later forgotten (Klimesch et al., 1996), as well as during associations.
Here we ask whether imageability enhances association-memory by better recruiting theta oscillations, or acts in a way that supplements the association-memory function of theta oscillations. We recorded EEG while participants studied pairs of words, tested with cued recall. Word pairs were either both high-imageability or low-imageability. If imageability increases recruitment of theta oscillations, oscillations will be present more often during study of high- than low-imageability pairs, but the impact on later memory will have the same magnitude. Alternatively, theta oscillations may not differ between imageability levels, but subsequent memory may depend more critically on theta oscillations during study of low-imageability pairs, for which an alternative strategy may not be available. The results will provide insight into the mechanisms of word-imageability on association-memory and how generally theta oscillations contributed to successful encoding of associations.

P28 Anger Perception in Alexithymia

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2) Annie Porthukaran (Department of Psychology, University of Alberta)
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Alexithymia is a personality trait referring to difficulties identifying and describing emotions, a restricted imagination and an externally-oriented communication style. This trait represents a trans-diagnostic vulnerability factor for mental illness. Attentional patterns underlying alexithymia are remarkably underexplored. We recently found that alexithymic individuals were able to accurately judge blends of two facial emotions, but avoided looking people in the eyes. The current experiment systematically introduced anger (clear social-emotional threat) into the facial blends. We asked if these anger-blends may decrease alexithymic individuals’ emotion recognition ability. A total of 91 healthy participants were included, scoring as high alexithymic (HA, females: N=26) or low alexithymic (LA, females: N=32) in the Toronto Alexithymia Scale (TAS). In the task, participants first passively watched and then judged the amount of anger in a face, blended (0%, 25%, 45%, 65%,100%) with another emotion (disgust, fear, happiness, sadness, neutral). Eye-movements were also recorded. Irrespective of the presence and amount of anger in face, response times were slightly longer in HA than LA, especially in females. Accuracy was significantly lower in female HA than LA, with no such differences among males. Results were not due to elevated depressive, anxiety-, or stress-related symptoms in HA. Introducing anger into this task had performance-lowering effects in alexithymic individuals, albeit only in females. High alexithymic females may be particularly sensitive to aversive social information. Anger may also have different action implications in males (approach) than females (avoidance), a hypothesis that will be tested further by eye-movement analyses.

P29 Alexithymia and Autistic Traits – shared and unique relationships with disordered eating

Yu Yuan Liu, Rahim Marani, Daniela Gomez, Esther Fujiwara

Alexithymia (difficulties identifying and describing emotions, restricted imagination, externally-oriented thinking) is a personality trait well-known to precede or accompany eating disorders. Recently, autism in eating disorders has also been described, especially regarding social withdrawal aspects of autism. Much of this research relies on alexithymia/autism questionnaires. We ask here how alexithymia and autism traits may overlap and relate to symptoms of disordered eating, using questionnaire data from N=3069 undergraduate students. Assessed were demographic variables, self-reported body-mass-index, alexithymia (Toronto Alexithymia Scale, TAS), autism traits (Autism Quotient, AQ) and eating disorder symptoms (Eating Disorder Screen for Primary Care, EPS; Eating Disorder Examination, EDE-Q12). Initial analyses of the AQ revealed poor psychometric properties, remedied through a 28-item version (AQ28) with five factors: (1) social skills, (2) communication/mindreading, (3) restricted/repetitive behaviour, (4) imagination, (5) attention to detail. Low to moderate positive correlations between alexithymia (TAS) and the AQ28 factors.
were observed, especially ‘social skills’. Hierarchical logistic regressions identified variables associated with disordered eating (EPS< 2 versus EPS> 1). Female sex, high BMI, AQ28 social skills and AQ28 restricted/repetitive behaviour predicted disordered eating. Including alexithymia eliminated influences of AQ28 social skills but retained effects of AQ28 restricted/repetitive behaviour. Similar outcomes were observed using hierarchical linear regressions on the EDE-Q12 in a subset of 952 participants. Social skills in the AQ28 overlap with alexithymia and did not uniquely explain disordered eating. However, restricted/repetitive autistic behaviour explained disordered eating over-and-above alexithymia. These relationships should be studied in clinical eating disorder populations.

P30  Creative metaphoricity and aesthetically-significant personal remembering  
Victoria Pearson, Shawn Douglas (Department of Psychology, University of Alberta), Don Kuiken (Department of Psychology, University of Alberta)

Kuiken et al. (2018) found that participants who experienced a dream that continued to influence their thoughts and feelings after awakening (impactful dreams) were more likely than those awakening from mundane dreams to include a metaphoric vehicle and topic in the same ad hoc class. The following pilot study partly replicates these findings and suggests also that this form of creative metaphoricity initiates a process according to which: (1) engagement with unconventional literary metaphors (with unconventional but categorically “similar” vehicles and topics) precipitates distinctively aesthetic outcomes (2) and these aesthetic outcomes, in turn, precipitate retrieval and transformation of categorically “similar” personal memories. Using participants who reported poor dream recall, we found that rated similarity between the vehicle and topic of unconventional literary metaphors predicted distinctively aesthetic outcomes (sublime disquietude; Kuiken et al., 2012) (p = .01) and that these aesthetic outcomes mediated reported transformations of narrative identity (e.g., emergent sense of self, poignantly bivalent self-relevant feelings) (p = .03). This pattern was most clearly precipitated by vaguely sensed similarity between the vehicle and topic of the literary metaphors; it was not evident for vaguely sensed similarity between the vehicle and topic of conventional nonliterary metaphors. Although these results were observed among poor dream recallers, future studies will explore whether frequent dream recallers awakening from impactful dreams experience dream-induced metaphoricity and also the transformations of self-relevant memories that derive from such creative cognition.

P31  The Effect of Immigration Class on Cultural Identities of Chinese Migrant Caregivers in Canada  
Shu Han (Teina) Wang and Kimberly A. Noels (Psychology Department, University of Alberta)

Previous research demonstrates that many immigrants face difficulties in integration into the host society, which is related to low sense of cultural identity of the host country. This case study aims to explore how immigration class affects the cultural identity of Chinese migrant caregivers in Canada. The subject of analysis for this case study is a female Chinese immigrant who came to Canada in 2008 under the live-in caregiver category. This case study employed a traditional qualitative research method of conducting a semi-structured in-depth interview by using a protocol with open-ended questions. The findings revealed that this Chinese migrant caregiver encountered various challenges in Canada, which negatively affect their living experience and reduces their sense of Canadian cultural identity. These challenges include: 1) low employment income as a caregiver; 2) employment issues after obtaining an open-work permit; 3) limited opportunity for future educational attainment due to lack of time and income to improve English Language skills; and 4) social isolation due to restricted opportunities to meet new people in the work environment; 5) concerns for future immigration possibilities for her parents. The findings suggest that there is an urgent need for 1) broadening the access to English language learning classes for migrant caregivers to improve their English language skills; 2) community programs that provide resources and support to alleviate migrant-caregivers’ financial burdens, well-being concerns, and other living difficulties that interfere with a smooth transition into the Canadian society.
Brain activity is often measured using electroencephalography (EEG) in a laboratory setting. However, laboratory settings are highly controlled and results may not be entirely applicable to outside environments. To accommodate for these drawbacks, we used a Raspberry Pi 3 for stimulus presentation along with a MUSE EEG headband and Smith LowDown Focus EEG glasses to record data. Together, we hope these devices can provide an accurate measure of brain activity which will be comparable to traditional EEG recording methods and allow for increased mobility outside the laboratory.

The goal of the current research is to present stimuli using a Raspberry Pi 3 and compare EEG data recorded by the Muse headband and Smith Lowdown Focus eyewear to determine if they are comparable to classic EEG recording hardware. The Raspberry Pi 3 is a small, low-cost computer that has been shown to allow for more portable and affordable stimulus presentation methods. The Muse headband created by InteraXon and the Smith Lowdown Focus eyewear created by Smith Optics are relatively inexpensive EEG devices for cognitive training.

To compare these two EEG systems participants complete two tasks. The first is designed to record baseline oscillatory brain activity where participants will maintain fixation or keep their eyes closed. The second task is an auditory and visual oddball task where participants will respond to rare target stimuli. Oscillatory activity recorded during baseline and event related potentials (ERPs), derived from EEG activity following oddball stimuli, will be used to compare the effectiveness of each EEG recording device.
T1 Exploring the Effect of Short Chain Fatty Acids on Gut-Brain Axis using a Microglial Cell Model

T. Chen, Dr. M. Churchward (Department of Psychiatry, University of Alberta), Dr. D. Kao (Division of Gastroenterology, University of Alberta), Dr. K. Todd (Department of Psychiatry, University of Alberta)

Studies of the human microbiome have developed the hypothesis of a gut-brain axis, a bidirectional communication system that occur through pathways like the Vagus nerve or bacterial products and metabolites, which include short chain fatty acids (SCFAs). Being blood brain barrier permeable, these SCFAs can influence the behavior of your nervous system by interacting directly with brain cells, including microglia. As part of the CNS’s innate immune system, microglia are involved in both nervous and immune response and can contribute to illness behaviours, which if chronically and inappropriately activated, may contribute to the development of depression.

This hypothesis is based on data from another study, which used fecal microbiota transplantation (FMT) to treat Clostridium difficile infections and saw a large change in both SCFA volume and reported quality of life measures. This project is related, but focuses on the influence of SCFAs on microglia and the potential for these metabolites to modulate the inflammatory response of microglia, which offers a mechanism connecting the changes in mood and microbiota in these patients. An in-vitro microglia model mimicking pre and post FMT conditions will be made with unique SCFA profiles, which will then be treated with an inflammatory stimulus and analyzed to determine its response. Testing for cell viability, proliferation, phagocytosis and inflammation, such as the release of cytokines and trophic factors will be used in developing a profile for each. It is expected that the post-FMT condition will have a reduced inflammatory response and possibly, an output of alternative factors.

T2 Longitudinal assessment of the behavioural effects of individual radio frequency identification (RFID) tagging in Pelvicachromis Pulcher

K. Wonsiak (Psychology Department), B. Hope (Neuroscience and Mental Health Institute), & P. Hurd (Psychology Department, University of Alberta)

Individually marking fish species for longitudinal research studies is essential when traditional means of identification (i.e., housing singly or with a different sex) is unfeasible. Although other marking procedures have been established for fish species, few are suitable for long-term usage on smaller species in laboratory settings. Radio frequency identification (RFID) tags have previously been used for individual identification by of smaller fish, such as zebrafish, though long-term behavioural effects of tagging have not extensively analyzed. We investigated potential behavioural effects of RFID tags in Pelvicachromis pulcher to determine appropriateness of RFID tagging in the laboratory. Fish were monitored for tag rejection and acute physiological effects to assess tag usability. We compared swimming exploration patterns in the open field test between pre-tagging and two months post-tagging to assess behavioural alterations due to RFID tagging. Results of behavioural analyses and tag viability will be discussed.
T3 Preclinical investigations in the acute post-stroke period: How does routine behavioral assessment influence recovery from intracerebral hemorrhage?
Lane Liddle, Ryan Reinders, Brittany Prokop, Colby Nadeau, Fred Colbourne (Department of Psychology, Faculty of Science, University of Alberta)

Clinical trials suggest that early mobilization following stroke can negatively impact patients, including those with intracerebral hemorrhage (ICH). Perhaps this is also the case in preclinical studies. Here we assessed whether behavioral assessment in the acute period worsens outcome in a rat model of ICH. This might occur because handling, behavioral testing and rehabilitation in rats, as in humans, could transiently elevate blood pressure (BP) thereby aggravating cerebral bleeding. In our first study we quantified the impact of behavioral testing on BP through the use of implanted blood pressure probes. As expected, handling and assessing neurological impairment transiently raised BP (e.g., by 20 mmHg). Next we completed a study to identify whether early behavioral testing and other routine laboratory manipulations actually affected hemorrhage volume in rats. Rats were given an infusion of collagenase into striatum to cause an ICH, and then they either received neurological testing or not. The rats survived until 72 hours and their brain hemorrhage volume was determined. Despite the impact on BP, there was no significant difference in brain blood volume between groups that received behavior testing and those that did not. Thus, simple behavioral assessment following ICH in rats does not lead to worsened outcome, although, it is possible that earlier manipulations and more sustained and stressful rehabilitation techniques may be harmful by causing worsened bleeding. Future studies will examine that hypothesis.

T4 Ionic dyshomeostasis after intracerebral hemorrhage
Cassandra Wilkinson, Brittany Fedor, Colby Nadeau, Jasmine Aziz, Paul Brar, Julia Clark, Frederick Colbourne (Psychology Department, University of Alberta and Neuroscience and Mental Health Institute, University of Alberta)

Intracerebral hemorrhage (ICH), a bleed into the brain, is a devastating type of stroke. ICH has a mortality rate of approximately 40%, and few victims recover fully. Brain edema (swelling) commonly occurs after ICH and can lead to death. Along with edema, there are significant alterations in the levels of key ions such as sodium, potassium, and chloride, which are essential to brain function. Rehabilitation improves behavioral recovery post-ICH, but benefits are limited. Thus, we hope to understand how rehabilitation therapies work to further improve their effectiveness, such as by using adjunct drug therapies. We have previously shown that rehabilitation improves brain function while partially restoring chloride levels around the bleed. Bumetanide blocks the transport of chloride into cells, and thus this drug should attenuate the increases in chloride, lessening brain edema and improving neuronal functioning post-ICH. We used a rat model of ICH to test whether bumetanide treatment for three days (vs. vehicle control) would improve outcome. We gave bumetanide early or late post-ICH and measured behavioural outcome, edema, and brain ion content after treatment. Contrary to our hypothesis, bumetanide did not improve behavioural outcome at either time, and did not improve edema after early dosing. We are currently collecting behavioral data with delayed treatment, but it seems that bumetanide actually worsens the change in element concentrations after late dosing. Further studies are needed to determine the mechanism underlying bumetanide’s effects especially since this drug is clinically used as a diuretic, including in those who may have a stroke.
What is theoretical psychology? To some it provides a post-modernist critique of psychology; to others it is now replaced by cognitive science. However, the University of Alberta's Center of Advanced Study in Theoretical Psychology (1965-1990) offered a different definition. It viewed theoretical psychology as a proper sub-discipline of psychology for developing and improving theory, and possibly for unifying psychology. This poster explores the Center's concept of theoretical psychology by graphing a collection of 1589 books from the Center's reading room using a treemap. Treemaps illustrate the collection's hierarchical organization: its top level is given by the main topics provided by the collection's Library of Congress (LOC) call numbers, and its secondary level is given by subtopics provided by LOC call numbers. A treemap of the Center collection reveals that the Center's book collection mirrors the Center's vision of theoretical psychology: a discipline that was part of psychology, focused on theory, and distinct from philosophy of science. The Center collection is also compared to another book collection from a cognitive science reading room. A treemap depicting the differences between these two collections highlights their different structures and emphases. This comparison reveals that the Center collection has notably more titles in Psychology, General Science, or Speculative Philosophy, and notably fewer titles in Mathematics, Physiology or Technology. These differences support the argument that if modern cognitive science has replaced theoretical psychology, then it has dramatically altered the Center's perceived relationship between theory and discipline.

Working memory (WM) is the ability to hold a limited amount of information in mind for a short period of time and then change or manipulate that information (Baddeley et al., 1992). WM deficits are associated with behavioral and learning differences in childhood, but there are inconsistencies in operational definitions and measurement that create challenges for clinical assessment and intervention planning. The present study sought to establish a replicable and age appropriate measurement model of WM in childhood. Children (N = 192) were recruited into four groups spanning early to middle childhood (nage4 = 48, nage5 = 36, nage6 = 54, nage7 = 54). Three working memory measures were drawn from the published literature: The Nebraska Barnyard (Wiebe et al., 2011), Listening Recall (adapted from Gathercole & Pickering, 2000), and Verbal Span (adapted from Nutley et al., 2011). Confirmatory factor analysis (CFA) and measurement invariance testing were used to select the best-fitting model and test its fit across age groups. A CFA model fit the data well, with each WM task score loading strongly and significantly on latent WM. Furthermore, there was support for measurement invariance across age 4 to 7 years although mean latent working memory increased with age. Given these findings, we propose this sequence of tests as a statistically sound measurement model of WM in early to middle childhood.
P35  Measuring Set Shifting in Early and Middle Childhood: Contributions of Mixing and Switching Costs
Daphne M Vrantsidis (Psychology Department, University of Alberta)
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The development of set shifting, the ability to switch between tasks or rules, is not well understood over the transition from early to middle childhood. Difficulties with set shifting can be broken down into mixing costs (decreases in performance related to holding two rules in mind) and switching costs (decreases in performance related to switching rules). This study charted the development of mixing and switching costs cross-sectionally in 4 to 7 year old children. Participants were 192 4- to 7-year-olds (48 4-year-olds, 36 5-year-olds, 54 6-year-olds, and 54 7-year-olds) recruited to participate in a longitudinal study examining executive function development in the transition from early to middle childhood. Participants completed three set shifting tasks (Advanced Dimensional Change Card Sort (A-DCCS), Shape School, and Global-Local), as part of a larger test battery. Mixing costs in accuracy were calculated for all three tasks. Switching costs were calculated for A-DCCS and Global-Local in accuracy, and for A-DCCS in reaction time. Mixing costs in accuracy significantly differed between age groups on A-DCCS and Shape School, but not Global-Local, with mixing costs decreasing in older children. There were no significant differences in switching costs in accuracy for A-DCCS and Global-Local, and in reaction time for A-DCCS. Results suggest that decreases in mixing costs, not switching costs, drive improvements in set shifting between ages 4 and 7. Results also suggest it may be fruitful to examine set shifting’s relations with key predictors (e.g., poverty) and outcomes (e.g., academic performance) over this important age range.

P36  The Role of English Use Anxiety on the Situated Ethnic Identities of International Students
Y. S. D. Zhang & K. Noels (Psychology Department, University of Alberta)

According to the Canadian Bureau for International Education (2016), there were 353,000 international students studying in Canada during the year of 2015, which signifies a 92% increase in size from the year of 2008. This study examines the identities of international students across four situational domains (family, friends, school, and public) and considers how language relates to patterns of situated identity. Specifically, this study explores the interactions of these situated identities with ethnic group importance, ethnic membership self-esteem, and English use anxiety. International students at a Canadian university (N = 109) completed a questionnaire online. A series of a mixed model ANOVAs revealed that identification with one’s ethnic group is higher than identification with Canadians in private domains (e.g., with family and friends), but the converse held in public domains (e.g., in the university and community). The patterns of situated identities were modified by English use anxiety, such that confident students reported stronger Canadian than heritage identity in the school domain, but anxious students reported no difference between identities in this domain. Moreover, a strong positive correlation was found between the heritage and Canadian identities of high English anxiety students in the “Friends” situational domain, though reasons for such association remain uncertain. The results suggest that more linguistically confident students acquire a second cultural identity more readily than less confident students, particularly in the school domain where they have regular, intensive contacts with English-speakers.

P37  Do Near Misses Influence Slot Machine Choice?
J.J.H. Yong, J.M. Pisklak, & M.L. Spetch (Department of Psychology, University of Alberta)

Near misses are considered a special kind of feedback in games of chance where losses visually approximate wins. In slot machines, these occur when all but the last reel line up (e.g., cherry-cherry-lemon). Although
near misses are presumed to contribute to gambling behaviour, current experimental findings are inconclusive. Our study examined whether near-miss feedback would reinforce people's choice behaviour on two concurrently available simulated slot machines. The slot machines differed in terms of reinforcement rate (random-ratio 4 versus RR7) or the presence or lack of near-miss feedback; one of which was held constant depending on the participant's assigned group. Specifically, participants in Group 1 (G1) could choose between a RR4 machine that presented near misses or a RR7 machine that also presented near misses. In G2, both machines were on RR4 schedules but only one presented near misses. G3 was structured as in G2 but both contingencies were RR7. G4 was structured as in G1 but neither machine presented near misses. All participants started the experiment with 2500 points and they were instructed to earn as many points as possible. Betting on a machine cost 10 points and 38 points were awarded on wins. The session ended after 300 choice trials and participants were paid up to $5 CAD depending on their score in addition to earning course credit. We found that people tended to choose machines that paid out at the higher rate, but the presence or lack of near misses did not appear to influence their choice behaviour.

**P38 Effects of temporal attention and color on visual detection: an EEG study**

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Alpha oscillations are known to impair detection of visual stimuli, but it is unclear if this is due to increased guess rate or decreased fidelity of the mental representation. Here we estimated fidelity and guess rate as a function of pre-stimulus alpha oscillations using a color memory task. The task consisted of a colored circular target (8.33 ms) followed by a backward mask. Target color was pseudo-randomly chosen from a list of 360 pre-defined RGB values. Of all trials, 20% were randomly chosen to not contain any targets. Following the mask offset, a color wheel composed of 360 evenly distributed colors appeared. Using the computer mouse, participants were asked to select a color from the color wheel that corresponded to the color of the previous target. The brightness and saturation was kept constant for each color composing the color wheel. Error was quantified as the difference between the presented target color on a given trial and the color participants selected from the color wheel. Error was computed in degrees from -180 to +180 where 0 degrees corresponds to the actual color of the presented target. During the task, EEG was recorded from 15 scalp locations (10/20 system). The power of the alpha oscillation was calculated on each trial time-locked to the onset of the colored target. Power prior to the onset of the target and color of the target were used as predictors of the error between actual target color and reported target color. In addition, the errors of each participant were fit to the standard mixture model of Zhang and Luck (2008) using maximum likelihood estimation to get the parameter values g (guess rate of the target color) and σ (precision of the mental representation of the target color). We also predict that alpha power will modulate the guess rate, but not the precision of the mental representation.

**P39 Working Memory as a Predictor of Second Language Oral Fluency in Adults**


When people are better at remembering the phonological form of novel words, they tend to have bigger vocabularies. This study investigated phonological memory as a predictor of second language oral fluency in novice adults learning Spanish or French and compared it to visuospatial memory. A sample size of eleven undergraduate students enrolled in an introductory level Spanish (n=7) or French (n=4) course participated in this study during the first (T1) and last (T2) four weeks of a 14-week semester. At T1, participants performed two language aptitude tests (a sound recognition task as a measure of phonological memory and a word recognition task as a measure of visuospatial memory). At T2, they were asked to narrate a short story in their second language. We operationalized oral fluency as the number of correct words spoken and the average length of pauses in that story. Those who scored higher in the word recognition learning task
(T1) uttered a greater number of correct words in their second language (T2). In contrast, the participants who scored higher in the sound recognition task (T1) produced fewer correct words, and had shorter pause-length and fewer fillers (T2). These results indicate that the components of working memory relate to oral fluency in different ways. We suggest that the more word-like the measure of working memory, the more closely related it is to oral fluency in a second language.

**P40  The relationship between mild cognitive impairment and driving ability**  
Reyhaneh Bakhtiari, Michelle Ehmig, Stephen Langor, Joanna Scanlon, Aaron Granley, & Anthony Singhal

Mild cognitive impairment (MCI) is considered an intermediate condition between normal aging and dementia. Research suggests that people with MCI have a high rate of progression to dementia. MCI displays deficits in attention, memory, judgment, and language. An important related area of research is MCI and associated diminished driving abilities that can lead to increased risk for automobile collisions and injury. The present study compared MCI and healthy older aged adults on several indices of driving and cognitive performance in order to investigate the nature of the relationship between MCI and specific cognitive impairments.

Twenty-five MCI individuals (8 female, 73.9±9.7 yr) and 49 control participants (22 female, 65.7±7.0 yr) participated in this study. Their driving skills were measured with a 45 minute on-road evaluation, and several computer-based cognitive tasks that test response-speed, memory, perceptual-motor skills, and decision making.

Analyses of covariance (ANCOVA) with age as a covariate indicated a significant difference between the MCI and control participants in the on-road driving task, where the MCI participants were consistently driving more poorly. MCI participants showed an interesting convergence of performance on the computer task with an increased reaction time, decision-making time, and a shift in performance on the memory tasks. Performance on the bimanual perceptual-motor tasks also showed a unique response pattern by the MCI participants.

The MCI individuals performed significantly worse than the controls on most of the computer-based tasks and on-road driving assessment. The results across all tasks show a unique pattern of deficits in cognition and perceptual-motor performance that may underlie the low driving scores. These findings are important to further our understanding of this disease, and foster the development of new strategies for MCI assessments.

**P41  ZENK expression in response to playback of full-length chick-a-dee calls in black-capped chickadee (Poecile atricapillus)**  
Juliana Montoya Sanchez, Erin N. Scully, Shannon K. Mischler, and Christopher B. Sturdy

Songbirds are a good model species to investigate the neurobiological processing of vocalizations because they are one of the few species of vocal learners. Previous research has focused on immediate early gene (IEG) activation in response to individual notes of black-capped chickadee (Poecile atricapillus) chick-a-dee calls. There have been some critiques that these findings are not ecologically-valid, as individual notes of this call are not often produced in the wild. We conducted a playback study and examined IEG expression in the auditory forebrain, utilizing ecologically-valid full-length chick-a-dee calls. Our aim was to compare IEG expression in response to conspecific (black-capped chickadee) and heterospecific (mountain chickadee & red-breasted nuthatch) calls. We predicted that high neuronal expression would be observed in response to black-capped chickadee calls and the closely related mountain chickadee (Poecile gambeli) calls, medium expression to black-capped chickadee calls and mountain chickadee calls played in reverse, and low expression to both red-breasted nuthatch (Sitta canadensis) calls and the pink noise condition. These findings would suggest that chickadees respond more to conspecific calls than heterospecific calls, which supports previous research on individual elements of calls in a more ecologically valid way, using complete calls.
Hippocampal State Influences Memory Consolidation
Zemina Meghji (Neuroscience and Mental Health Institute), Claire Scavuzzo (Department of Psychology), Brandon E. Hauer (Neuroscience and Mental Health Institute), Clayton T. Dickson (Neuroscience and Mental Health Institute, Department of Psychology, Department of Physiology)

The mechanism by which our memories become permanent has been a question many neuroscientists have endeavoured to answer, and although there has been much progress towards understanding how our memories stabilize, the specific architecture of neural activity which helps with this process is largely unknown. Given that the hippocampus produces unique neural population activity signatures associated with distinct behavioural states, we are able to influence hippocampal state by encouraging specific behaviours. In this way, we can manipulate hippocampal states to test if they might benefit future spatial memory retrieval. Following a delay period during which rats were encouraged to either sleep, groom, or run/explore, we tested their ability to remember a previously learned novel location in the Morris water maze task.

Our results suggest that sleep produces the most benefit to memory recollection. This suggests that the hippocampal activity patterns during sleep (likely the slow oscillation and/or ripples) produces a benefit to future memory retrieval. To our surprise, encouraging grooming behaviour, which should promote ripples in the absence of slow oscillations, had little effect on future retrieval. Indeed, encouraging running/explores (which should promote theta activity), had an apparent detrimental effect on future retrieval. While this study is suggestive for the potential role of specific hippocampal activity patterns in the solidification of memory, it is still necessary to record the actual activities that participate in long-term memory solidification.

An exploratory look at the cognitive processes underlying the delay at the morpheme boundary by examining typing errors
M. Dang, S. Halfyard, S. Johnson, B. Rubio, C. Gagné & T. Spalding (Department of Psychology, University of Alberta)

Prior research suggests that the typewritten production of compound words makes use of morphological structures with an increase in typing latency at the morpheme boundary. Compound words are made up of two free morphemes separated by the morpheme boundary (e.g., dogsled); dog is the first constituent (C1) and sled is the second constituent (C2). Our aim is to investigate the cognitive processes that cause the delay at the morpheme boundary by examining errors. Previous research on typing latency suggested that the delay was due to planning for C2. Through examining data with errors, we hypothesize that another possible cause for the delay is error-checking for C1. Ongoing investigations focus on examining the position of the errors in the participants’ typed letter string and comparing them to the position of the participants’ correction (i.e., the point where the participant makes a deletion to correct the error). We predict a high probability of corrections around the morpheme boundary (which includes the last letter of C1 and the first letter of the C2), which will confirm error-checking as one of the processes occurring during the delay at the morpheme boundary. Further analyses will provide insight on whether the processes that occur during the delay is either error-checking for C1, planning for C2, both, or other additional processes.

Judging associations without learning associations
S. Chakravarty & J. B. Caplan (Department of Psychology, University of Alberta)

Neuropsychological and neuroimaging studies suggest that association memory (the memory for the relationship between two or more items) is dependent on hippocampal activity while item memory (the memory for single items) is not. Interestingly, one way of testing association memory, associative recognition, is independent of the hippocampus under many experimental conditions. We present a model that can use item-memory to do associative recognition, without explicitly storing associations. In
this simple model, the memory trace consists of a vector of summed feature strengths, averaged across items within a list (Anderson, 1970). We added the assumption that a given item can influence the strength of particular features of another item, in a relationally specific way. We assume that this same relational influence occurs both at study and at test. The model can produce high levels of associative-recognition accuracy by drawing inferences about whether the stored feature values are consistent or inconsistent with the relationally sensitive features of the probe pair. Parameter exploration reveals how performance level might depend on experimental conditions, and shows that under certain conditions, the strategy will break down completely. This might explain why for some patients with hippocampal damage, who are found to fail in cued recall of associations, can still perform at intact levels on certain forms of associative recognition tasks.

P45  Delay-discounting in patients with HIV-1 infection
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Delay-discounting measures the ability to delay immediate small rewards in favour of later but larger rewards. Problems with delay-discounting are well known in the context of substance- and other forms of addiction. Fronto-striatal brain regions subserve delay discounting and are particularly vulnerable to damage in HIV-infection. Few studies explored delay-discounting in HIV-positive populations. Outcomes were inconclusive regarding primary or addiction-related comorbidities as determinants of delay-discounting in the context of HIV. We explored patient characteristics influencing delay-discounting in an HIV-infected cohort from the Southern Alberta Clinic in Calgary (n=128). Discounting rate, k-coefficient, was derived from a computerized delay-discounting task. A higher k is indicative of higher delay-discounting. Pearson correlations identified the background, clinical, and cognitive variables associated with k, followed by linear regression analysis. Discounting rate was associated with demographic variables (age, place origin, education), psychiatric risk-factors (marijuana and cocaine use, depressive symptomatology, suicide risk history), duration of HIV-infection and cognition (attention, verbal abilities, executive functions). Birth place exerted dominant influences on performance. Thus, we also analysed North American (n=99) and non-North American (n=29) participants separately. In North Americans, delay-discounting was related to low executive functions as well as to a history of cocaine abuse and suicide risk. In non-North Americans, delay-discounting related to current marijuana use. In conclusion, behavioural impulsivity in HIV-infected participants was associated with a combination of substance use, psychiatric comorbidity, as well as cognitive deficits indicative of frontal lobe damage. Identifying modifiable risk-factors of impulsivity in HIV may inform the development of treatment strategies.

P46  Ethnicity, Language, and Discrimination
Sharon Tahir and Jessika Skurski

Ethnicity encompasses a variety of facets, such as language, race, and religion, prompting individuals to carry differing definitions. Several studies have also established that discrimination is perceived to be targeted toward an individual's ethnic group more often than to themselves personally. We examined whether discrimination based on language skills correlated with how bicultural individuals defined ethnicity in relation to language. We analyzed 645 bicultural university students' (Mage = 19.36, SD = 2.58) responses to the nature of the relationship between language and ethnicity. Thematic analysis explored the extent to which participants viewed language as related to ethnicity. Next, quantitative analysis assessed whether the degree to which individual's related language to ethnicity influenced feelings of group and personal discrimination based on language skills. Thematic analysis revealed that individuals believed language was
related to ethnicity, unrelated to ethnicity, or situationally related to ethnicity, with several subthemes within each of those three categories. For example, within the “related” group, participants explained language as being intertwined with one’s ethnic identity. Within the “unrelated” group, some participants believed language was solely determined by geographical location. Quantitative analysis revealed that the extent to which bilingual individuals related language to ethnicity did not significantly correlate with the amount of group or personal discrimination perceived. However, due to incongruent perceptions of what ethnicity encompasses, future research must assess its perceived relatedness to facets other than language. This can in turn provide insight into the discrepancy between feelings of group and personal discrimination.

P47 A four-facet model of subjective memory decline in non-demented aging: Selective prediction sensitivity for women
Shannon Drouin (Department of Psychology, University of Alberta), G. Peggy McFall (Department of Psychology, University of Alberta; Neuroscience and Mental Health Institute, University of Alberta), Samantha Fu (Department of Psychology, University of Alberta), Roger A. Dixon (Department of Psychology, University of Alberta; Neuroscience and Mental Health Institute, University of Alberta)

Introduction: Recent studies investigating subjective memory decline (SMD) in aging suggest that self-perceived decline may be an early indicator of future objective decline, Mild Cognitive Impairment and Alzheimer’s disease (AD). We examine longitudinal profiles and objective memory prediction of five SMD facets: (1) memory complaints, (2) memory concerns, (3) memory anxiety, (4) memory compensation and (5) memory self-efficacy. Given sex differences in AD biomarkers and prevalence, we test models separately for females and males. Method: From the Victoria Longitudinal Study we selected cognitively normal participants (n=580, M age = 70.21, 55-95 years, 65% female) with three waves of data. The SMD facets were measured with items from established memory inventories. Validated episodic memory measures formed a latent memory variable. Mplus (7.0) was used to investigate latent growth functions and predictions of memory. Results: First, confirmatory factor analyses revealed a four-factor model of SMD with concerns/anxiety as a combined factor. Second, latent growth modeling revealed significant variability in overall SMD level (b = 0.013, p < 0.001). Prediction models with sex stratification showed selective effects: memory complaints (b = 0.076, p=0.001), memory concerns/anxiety (b = 0.043, p<0.041), and memory self-efficacy (b = 0.085, p=0.002) predicted memory change for women only. Conclusion: The subjective experience of memory decline presents as an early marker of objective decline differentially by SMD facet and sex. Such results encourage investigation of precision mechanisms and prevention strategies to target at-risk individuals before the onset of AD-related symptoms.

P48 Behavioural responses to female song playback in Black-Capped Chickadees (Poecile atricapillus)
C. Montenegro (Department of Psychology, University of Alberta), W. D. Service (Department of Psychology, University of Alberta), K. A. Campbell (Department of Psychology, University of Alberta), E. N. Scully (Department of Psychology, University of Alberta), J. V. Congdon (Department of Psychology, University of Alberta), S. Mischler (Department of Psychology, University of Alberta). & C. B. Sturdy (Department of Psychology, Neuroscience and Mental Health Institute, University of Alberta)

Songbird vocalizations, specifically songs, are used in territorial defense and mate attraction. Past research has focused primarily on male songbirds in temperate regions overlooking the possibility and function of female song. Recent studies suggest that female song serves similar functions to male song. The function of female song, the fee-bee in black-capped chickadees (Poecile atricapillus) has not been explored, however, male and female chickadees fee-bee songs differ both perceptually and acoustically. Therefore, we hypothesized that female fee-bee songs have a distinct function from male song. We conducted a behavioral playback study in which male and female chickadees were presented with playbacks of females songs. The same female chickadees’ fee-bee songs were played to pairs of males and females with the
following responses evaluated post hoc from video: (a) phonotaxis (i.e., movement towards sound); (b) general movement (i.e., beak wipes, feather ruffles, perching, and flight); and (c) vocalizations (i.e., fee-bee songs, chick-a-dee calls, gargle calls, and tseet calls). We predicted that males will move toward the direction of female song playback, become more active, and produce songs. By comparison, females will move away from the female song playback, display aggressive behaviors and vocalizations (i.e., gargle calls, and tseet calls). Further data collection and analyses are currently being conducted to determine whether significant differences between groups exist and support hypotheses regarding the function of female chickadees’ song.

P49 CRITICAL AGE VS. CRITICAL PERIOD: The Identification of the Critical Period of Adaptive Social Integration When Immigrants Move to Canada
A. N. Obiero & K. A. Noels (Psychology Department, University of Alberta)

There are mixed findings in the literature concerning whether a crucial age, a specific age criterion or a critical period, a developmental stage that we may reach at different ages, facilitates adaptive integration of first generation (G1) immigrants into their new culture. Bleakley and Chin (2010) found age nine to be a critical age, while those older than nine showed poorer integration into their host culture. In comparison, Ahn, Chang, KeKeyser & Lee-Ellis (2017), found that age twelve was the optimum age for easier integration and that those older than twelve years old displayed poorer integration. We studied 150 undergraduate students who completed an online questionnaire that assessed situated identity scales, bicultural identity scales and others. To clarify the critical age, we sought to identify the critical period for our sample. We found no significant difference between discrete age categories. However, using developmental and education level-cutoffs (e.g., ages 0-4.4 kindergarten; ages 4.4-8.9 primary school, etc.), the middle-school period (ages 6-12), emerged as the critical developmental period for identity integration. In addition, the findings exhibited a common theme: regardless of age at migration, all participants were more likely to identify as Canadian compared to their heritage culture while they were in public, whereas when they were among family, they were more likely to identify with their heritage culture rather than as Canadian. This finding suggests that we have access to cultural schemas which are activated depending on the context and/or interlocutor, in order to facilitate effective communication.

P50 Colonization: How it affects identity
Allison R. Mock, Rebecca Alexander & Dr. Kimberley Noels (Psychology Department, University of Alberta)

Current research focuses on the distinctiveness of individualistic and collectivist cultures. However, there is a lack of acknowledgement of the differences within collectivist cultures. There are many historical events that influence how certain cultures develop self concept, such as how colonized nations have been influenced by western societies. This study aims to compare collectivist cultures that have a history of British colonization and those that have no such history to see if multicultural exposure enhances a participant’s identification with Canadian culture. This study involves undergraduate students (N=251) at the University of Alberta from British-colonized collectivist countries (n=159), such as India and Nigeria, and from non-British-colonized collectivist countries (n=92), such as China and Korea. This study examines participants’ strength identification with Canadian culture and whether their heritage identity facilitates their Canadian identity. We hypothesize that due to participants multicultural exposure in their heritage culture, those from British-colonized-countries will identify more with Canadian culture than those from non-British-colonized-countries. We anticipate this prediction based on the multicultural exposure that British colonization has induced, having a lasting Western influence on colonized countries, such as India and Nigeria. This research encourages scholars to surpass the traditional binary system of individualist and collectivist cultures, establishing a deeper understanding for how historical occurrences, such as colonization, can create differences within collectivist cultures.
Focus group methodology, as an open-ended interview approach, provides an opportunity for research participants to share experiences and perceptions in group discussion. Highlighting the dynamic nature of focus groups to explore Chinese immigrants’ ethnic identities, the Chinese Longitudinal Study included focus group interviews. The focus groups implemented graph sketching to visualize participants’ identity development, to supplement data from structured interviews and questionnaires. Fifteen Chinese immigrant participants were assigned into small discussion groups that were led by two interviewers, and they were instructed to sketch the development of their ethnic and Canadian identity graphs since arriving in Canada. Analysis of the diverse trajectories showed the Chinese immigrants’ ethnic and Canadian identities development can be categorized into five patterns each. For Chinese identity, these consist of “flat”, “decreasing I”, “decreasing II”, “increasing” and “fluctuating”, whereas for Canadian identity, these consist of “flat”, “fluctuating I”, “fluctuating II”, “increasing” and “bell shape”. The study results highlight the main impacts of life events on the trajectory of participants’ identities development. The identity sketches depict a broader perspective on participants’ identities change by displaying the starting points, turning points, and trends on a line graph. This study also helps us understand Chinese immigrants’ acculturation and integration process within the Canadian cultural context, which is reflected in their identity development.

Electroencephalography (EEG) records neural activity and averaging this activity around specific stimuli creates an event-related potential (ERP). In order to understand when certain events occurred, the EEG data has to be marked to indicate stimulus onset. Unplanned events, such as those occurring in daily life, are difficult and imprecise to account for in the EEG data. Here we propose a method to account for both controlled and unexpected stimuli by recording stimulus presentation using a GoPro camera. Participants completed a visual oddball paradigm whereby responses followed rare, target stimuli and were withheld after common, standard stimuli. Each experiment was recorded using a GoPro camera and the onset of each stimulus was determined in two ways: Markers were added directly into the EEG recording or the recorded video was used to determine stimulus onset. These times were then used to independently create ERPs for both targets and standards, allowing us to directly compare the efficacy of traditional EEG markers and stimulus onset times recorded by the GoPro camera.

While the unaltered stimulus times from the recorded video did not produce comparable results, a standardised adjustment could be performed so that both the marker and video stimulus times produced nearly-identical ERP waveform typical of an oddball task. The P3 response, a positive-going deflection following presentation of the rare stimuli, was observed using both sets of stimulus times. These results suggest that a GoPro video recording may be used to understand neural activity following both experimental, and unexpected, stimuli.

The quality of friendships children experience in middle childhood contributes to their school adjustment. Children can experience friendship quality as positive, seen in the degree to which children feel close to
and bond with their friend. Friendship quality may also be negative where children experience unresolved conflict with their friend. Individual characteristics and children's peers status may also contribute to the quality of friendship experienced. Children who act aggressively towards their peers may be more likely to be rejected by those peers. Over time these children may experience higher conflict and less closeness in their friendships. This may only hold true when children are in classrooms where the majority of children believe that their classmates approve of the use of aggression towards others. The purpose of this study is to investigate peer aggression and peer rejection as predictors of friendship quality across one school year, and classroom normative beliefs of aggression as a moderator of these associations. Participants included 506 children in grades 1 to 4 from high-needs schools. Children completed surveys on three occasions across one school year (fall, winter, and spring). Children reported on closeness and conflict in their friendships, and on their beliefs about the acceptability of aggression (these scores were aggregated within each classroom). Peers rated children's peer aggression and peer rejection. This study will add to the understanding of how peer aggression and rejection relate to children's friendship quality in the context of their classroom norms about aggression.

P54 Investigating the Relationship Between Hormonal Contraceptive Use and Borderline Personality, Empathy and Oxytocin Level
Irvine, T. B. & Hurd, P. L. (Psychology Department, University of Alberta)

Hormonal contraceptives (HC) alter naturally occurring levels of sex hormones in females. Previous literature has shown that fluctuations in estrogen and HC use are related to behavioural and psychological changes in women. Findings support the observation that HC use may be linked to an increase in borderline personality disorder (BPD) symptomology. In the present study, we investigate the relationship between HC use, BPD, empathy, and oxytocin. We hypothesize that HC use increases BPD-like symptoms and decreases empathy through a mechanism that interferes with oxytocin levels. 200 female participants were recruited using an undergraduate research participant pool. Participants completed the Reading the Mind in the Eyes task. This test measures theory of mind, which overlaps with the term empathy. Next, participants completed a questionnaire that assessed BPD symptoms, phase in menstrual cycle, and HC usage. Lastly, saliva was collected by passive drool. Salivary oxytocin measurements will be executed using Enzo Life Sciences enzyme-linked immunosorbent assay (ELISA) kits. We expect that HC use and low estrogen will result in increased BPD symptoms, decreased empathy scores, and decreased salivary oxytocin levels. Widespread usage of HC may have implications for the women who use them and for their relationships. Increasing our knowledge of how HC usage may interact with an individual’s behaviours and cognition is critical in informing women on potential effects of HC use as well as potentially developing more modernized forms of HC that do not alter female behaviour and cognition.

P55 Exploring gender imbalance in computing science

Science, technology, engineering, and mathematics (STEM) are often perceived as male-dominated fields. Gender gaps in some STEM fields have decreased, but not in computing science (CS). According to the 2010/2011 University of Alberta Summary of Statistics, 80 out of 93 full-time undergraduate CS majors were males. Based on previous literature, we investigated seven overarching themes that may contribute to gender disparity in CS: stereotypes, attitudes and beliefs, environmental and institutional factors, societal factors, nature of CS as a career, lack of interest, and academic course load. A total of 428 female and male undergraduate students participated in the study by completing an online survey. The data is currently undergoing analysis. Insights into this issue will provide the Department of CS at the University of Alberta with information to improve their programs and courses in attempt to address the existing gender discrepancy.
Bullying is a group phenomenon that 63-73% of adolescents report witnessing. Bullying involves not only the aggressor and target, but also bystanders. Adolescents who stand by or participate in bullying situations in some way often play one of four distinct bystander roles: outsider (e.g., ignoring or avoiding bullying situations), defender (e.g., supporting targets of bullying and encouraging others to stop bullying), reinforcer (e.g., providing an audience by laughing and inciting bullying behaviour), or assistant (e.g., participating in bullying behaviour but as a follower). Personal characteristics of adolescents have been found to predict their bystander roles, which include characteristics such as leadership skills, self-efficacy, prosocial behaviour, and use of relational and physical aggression. Yet less is known about how these characteristics interact within an individual to predict bystander roles in a group context. The current study investigates whether there are distinct leadership profiles that are associated with specific bystander roles. Participants included 1,775 adolescents in grades 7-9 from seven junior high schools in Western Canada. Adolescents were followed over two school years and completed data on four occasions (Fall 2014, Spring 2015, Fall 2015, and Spring 2016). Adolescents reported on their bystander roles, leadership skills, self-efficacy, prosocial behaviour, and use of relational and physical aggression. This study will add to an understanding of bystander roles in bullying, particularly highlighting the personal characteristics associated with specific bystander roles.

The perception of a leader’s trustworthiness is impacted by feelings of uncertainty within the leader’s group. When group members feel confident, they tend to support and trust a leader who embodies the values and beliefs of the group (i.e., a prototypical leader; Hogg, 2001). Under feelings of uncertainty, however, group members are more likely to support a nonprototypical leader (Rast et al., 2012). The effect of uncertainty on perceptions of leader trustworthiness could be moderated by whether the leader is perceived as being in power by title alone or in power through demonstrating strong ties to the group (Abrams, Randsley de Moura, Marques, & Huchison, 2008). The current study investigated the effect of acquisition of leadership, leader prototypicality, and uncertainty on perceptions of trust in the leader. Leaders either were placed into power by someone else or voted into power by the group and represented either prototypical or nonprototypical qualities. Leader prototypicality and uncertainty significantly influenced perceptions of leader trust and those effects were supported by a three-way interaction of leader prototypicality, uncertainty, and acquisition of leadership. Our results indicate that not only what the leader represents but also how the leader acquired power affects the perception of group members during uncertainty.

Coordinated neural activity during sleep has a positive influence on memory processes. The slow oscillation (SO), a ~1 Hz cortical rhythm apparent during slow-wave sleep, has a demonstrated role in solidifying episodic-like memories. This may be a consequence of its dynamic coordination with a similar form of hippocampal activity, allowing for staged synchronization of widespread ensembles of neurons important for a memory trace. Effectively, the SO may be a potential offline platform for information to be replayed between hippocampus and neocortex, allowing for consolidation. In the context of this SO circuit, we have been studying the role of the nucleus reuniens (RE) thalami, which mediates a direct connection between
cortex and hippocampus. Using an optogenetic approach, we selectively stimulated RE inputs to the hippocampus and could reliably generate a hippocampal evoked response. Consistent with an important role in coordinating the two areas, multi- and single-unit recordings showed SO-correlated activity in RE cells. Crucially, when RE cells were chemogenetically inhibited, the synchronization between cortical and hippocampal sites decreased. The RE appears to be an integral part of the slow-wave memory circuit, acting as a mediator between cortex and hippocampus, especially for slow oscillatory activity.

**P59  Commonalities of Unconsciousness: Sleep-like EEG dynamics under anaesthesia**

Rachel Ward-Flanagan (Neuroscience and Mental Health Institute, University of Alberta), Alto Lo (Department of Psychology, University of Alberta), Marissa Sobey (Department of Psychology, University of Alberta), Clayton T. Dickson (Neuroscience and Mental Health Institute, Department of Physiology, Department of Psychology, University of Alberta)

Sleep is a neurobiological process vital for basic physiological functions and thus, survival. Yet, despite the fundamental significance of sleep, delineating its underlying mechanisms has been slow to progress since the most common model for sleep has been sleep itself. Naturally, anaesthesia, which has direct behavioural parallels to natural sleep, such as reversible loss of consciousness, decreased sensory awareness and reduced behavioural responsiveness, presents a potential alternative model for natural sleep. Our aim is to characterize how clinically relevant anaesthetics promote specific electrophysiological components resembling natural sleep in order to identify how anaesthesia may co-opt endogenous sleep mechanisms. The archetypical EEG dynamics of natural sleep consist of spontaneous alternations between activated and deactivated forebrain states, known as REM and non-REM sleep, respectively. These spontaneous alternations are correlated with several critical physiological functions, including modulation of respiratory activity during sleep, changes in heart rate, as well as higher order neural functions such as memory consolidation. Currently, our data suggests that only urethane shows robust spontaneous forebrain state alternations which strongly resemble the REM/nREM cycle observed in natural sleep in terms of these physiological correlates, dependence on ascending anatomical pathways, and electrographic (EEG) components and their temporal dynamics. Subsequently, urethane is the most viable anaesthetic model for natural sleep that we have assessed at present.

**P60  Black-capped chickadee (Poecile atricapillus) response to altered syntax fee-bee song**

W. D. Serviceac, C. Montenegroac, K. A. Campbellac, S. Mishlerac, E. N. Scullyac, J. V. Congdonac, & C. B. Sturdyabc (Department of Psychology, Neuroscience and Mental Health Instituteb, University of Alberta)

The two-note fee-bee song of the black-capped chickadee (Poecile atricapillus), primarily used by males for mate attraction, is typically produced with reasonably rigid temporal sequence and structure (Smith, 1991). Our lab has found evidence that chickadees sometimes produce extended versions of this song containing additional fee notes at the beginning of the song and/or additional bee notes at the end of the song. Previous studies have altered the individual notes to examine the salience of the components within the song (Roach et al., 2017), and explored some alterations in note repetition and the salience of the song (Ratcliffe & Weisman, 1986). We propose a novel investigation into whether the repetition of the whole fee-bee song or the repetition of the individual notes produces a more salient song. To answer this question, we will present both male and female chickadees with male-produced and female-produced songs with altered syntax: fee-bee-fee-bee and fee-fee-bee-bee. We intend to record movement toward and away from the playback speakers as well as any vocalizations made towards the sound and body movements (e.g., gaping, body ruffling, wing quivering). We predict that females will respond more to fee-bee-fee-bee variation of the song and males will respond more to the fee-bee-fee-bee songs based on past research on internote-intervals and fee glissandos (Roach et al., 2017). Data is currently being collected and will be discussed.
P61 Matrix model for associative memory using spiking model of neurons
Kaiyuan Xu (Department of Computing Science, University of Alberta), Kelvin E. Jones (Faculty of Kinesiology, Sport and Recreation, 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)

Cued recall is a memory test that uses unrelated pairs of words during the encoding stage and performance is tested by presenting one word and asking the participant to respond with the other. One popular theoretical model of this process is matrix model for associative memory (Anderson, 1970). The assumption of this model is that the brain will allocate a fixed number of neurons, some of them belong to the input layer and some belong to the output layer, to store the associations in synaptic weights between the layers. We explored an implementation of the matrix model in a simulation with spiking neurons, to evaluate the effectiveness and challenges introduced by a more neurally realistic model. We chose the Izhikevich model for spiking neurons because it exhibits neuro-computational properties of biological neurons and easily scales to large networks. The performance of the model was measured by the cosine of the angle of the mean centered vector of recovered input and the mean centered vector of actual input, and random noise was added to the model by randomized currents sent to the output layer of neurons. The model demonstrates that it is possible to store some associations, but much less than what would be stored in non-physiological neuron.

P62 Age differences in Amatitlania nigrofasciata telomere dynamics
K. L. Fjellner (Psychology Department, University of Alberta), S.C.P. Renn (Department of Biology, Reed College), P. L. Hurd (Psychology Department, University of Alberta)

Telomeres are composed of non-coding DNA sequences located at the end of chromosomes. They are comprised of TTAGGG repeats and their complements, part of which are lost after each cell replication. Telomeres serve as end caps to protect the integrity of our genes but when they become too short, the cells cannot replicate any further. Telomere attrition has been associated with normal aging and abnormally short telomeres have been linked to early-life stress as well as negative health outcomes in humans. Similar results have been shown in medaka fish (Oryzias latipes). However, telomere length in relation to age has not been examined in any other teleost species. We examined Amatitlania nigrofasciata brain, liver, and fin tissue from fish at one year of age and fish at three years of age. Genomic DNA was extracted from tissue and then a modified qPCR protocol was used to measure telomere length and single gene copy ratios for each age group. The data collected from this study serves as a methodological verification and a foundation to examine telomere dynamics in relation to the lifelong effects of early-life stress in fish.

P63 Heritage language anxiety as a moderator for situational ethnic identity
Ferdose Mohamed & Kimberly A. Noels

Language anxiety can affect people’s sense of belonging in a community or in a country. The present study examined how heritage language anxiety in immigrants and their offspring affects sense of identification as members of their heritage group and as Canadians. More specifically it investigated differences and similarities in situated ethnic identity means across people who feel low or high anxiety when using their heritage language. We hypothesized that participants who had high heritage language anxiety would identify more as Canadians than as member of their heritage group across the situational domains, and that participants who had low heritage language anxiety would identify more as members of their heritage group. Two hundred and ninety students at the University of Alberta completed a questionnaire assessing their multicultural identity and language anxiety. An ANOVA compared patterns of situated ethnic identity across four situational domains (family, friends, university and community), and two identities (Canadian and heritage), and heritage language anxiety (low and high). The results showed that participants with low and
high heritage language anxiety had similar situational identity patterns. Differences arose when comparing the means of their identities in different situational domains; participants with low heritage language anxiety identified more as Canadians only in the school and community domains, whereas participants with high heritage language anxiety identified more as members of their heritage group only in the family domain. The results can help language instructors and settlement service providers better understand how language anxiety relates to patterns of identity acculturation.

P64  Cytoarchitectural organization of the telencephalon and diencephalon of Amatitlania nigrofasciata
B. Hope (Neuroscience and Mental Health Institute), K. Wonsiak (Psychology Department), & P. Hurd (Psychology Department, University of Alberta)

Neurobiological research uses the neuroanatomical organization of teleost fish to explain and model systems of functional lateralization and evolutionary differences between species. Notably, cichlid fish consist of over 3,000 species and are popularly studied due to their complex plastic social behaviour and cognitive abilities. Despite this increasing interest, few descriptions of structures in the central nervous system of cichlids have been established, limiting the ability for cross-species comparisons. We mapped the cytoarchitecture of Amatitlania nigrofasciata, a highly territorial and aggressive breed of Central American cichlid. Using a Nissl stain, we examined cell density and distribution across both the telencephalon and diencephalon. Our atlas indicates that the cytoarchitectural organization of the telencephalon and diencephalon of A. nigrofasciata is similar to other teleost species, including the presence of highly differentiated nuclei with some observed differences.

P65  Effects of recipient cognitive status on perceptions of mistreatment while in care
Rachel Elyse Runac & Sheree T. Kwong See (Psychology Department, University of Alberta) & Alexander Choy (University of Calgary)

Research has shown older adults with dementia are at a greater risk for mistreatment while in care compared to cognitively healthy older adults (VandeWeerd & Paveza, 2006). While the focus in literature has been to implicate caregiver burden, our research has examined the impact of dementia stereotypes (see Runac, Kwong See, & Choy, 2017). We found that when a care recipient was described as being in care because of Alzheimer’s dementia (cognitively unhealthy) compared to diabetes (cognitively healthy), viewers of a video tape depicting an abusive exchange perceived cognitive and physical competence as lower when the care recipient had dementia. The caregiver responsible for the abusive care was perceived as more respectful, nurturing, competent, and benevolent when the care recipient had dementia compared to diabetes. This study added another cognitively healthy comparison (broken hip) to examine if the stereotype of enhanced physical ability within a dementia status would emerge. As we had found previously, a care recipient with dementia was perceived as lower in cognitive and physical competence compared to cognitively healthy conditions (broken hip, diabetes), as behaving more respectful compared to diabetes, and more satisfied compared to the broken hip condition. The caregiver was generally perceived more positively in the dementia condition. Our research illustrates how dementia stereotypes may lead to the abuse of a person with dementia being perceived more leniently.

P66  Teacher’s feedback influences students’ mindsets and motivation
Camilla Osman, Nigel Mantou Lou, Kimberly A. Noels

Language learning is an important factor for the cultural adjustment of students whose second language is English (ESL) in Canada. The purpose of this experiment is to determine whether a teacher’s feedback could influence beliefs about whether language intelligence is malleable or fixed in ESL students. Participants were international university students in introductory psychology. Experimenters who were native English
speakers posed as English teachers and administered a difficult English test to 187 participants before providing them with three different feedbacks: consoling, constructive, or control. Consoling feedback implied a fixed mindset, while constructive feedback, a malleable mindset. Following the test, participants completed a questionnaire to measure mindset, language intelligence beliefs, and basic psychological needs satisfaction. The results indicated that participants who received the control feedback indicated less autonomy and competence compared to participants who received both the constructive and consoling feedbacks. This suggests that more specific feedback may lead to greater autonomy and competence for students compared to general feedback. We found no significant differences in students' language intelligence mindsets across all conditions. The results may reveal the impact and importance of how feedback is delivered to students in a learning environment.

P67 Exploration of the associative recognition task in a Bayesian model
Sophie Taylor (Department of Physics, University of Alberta), Sucheta Chakravarty (Department of Psychology, University of Alberta) and Jeremy Caplan (Department of Psychology, University of Alberta)

Association memory refers to the relationship between two or more items (for example, a pair of words). Association memory can be tested with the associative recognition task, where participants study a list of word pairs, and are asked to determine whether a probe-pair was in this original list (intact probe) or composed of words from different pairs (re-arranged probe). In contrast, in item recognition, participants study a list of single words and judge whether a given word was in the list (target) or not (lure). Here we demonstrate item recognition using the Bayesian computational model, Retrieving Effectively from Memory (REM; Shiffrin & Steyvers, 1997) and compare with associative recognition. In REM, a “word” is a vector of feature values which are drawn probabilistically from a geometric distribution. To model the study phase, a list of words is stored with some probability of features being stored incorrectly. Each recognition probe is evaluated based on a Bayesian calculation to determine the likelihood that the feature values of the probe match each memory trace, then averaged to obtain a global familiarity value. For associations, paired words are concatenated, doubling the length of the stored vectors. Because the lures in associative recognition are composed of studied words, this results in a decreased ability of the model to differentiate between intact and rearranged probes, explaining the greater difficulty of associative recognition than item recognition.

INVITED SYMPOSIUM

12:45 - 1:45 PM  |  Room: ECHA 2-140

Social Identity and Existential Threats

Co-Chairs: Kenda Burke and Brittany Hope

Speakers: Christine Kershaw, Michael Sharp, and Andy Scott

Speaker 1  When to not blur the lines within a group: The interaction of leader rhetoric and threat
Christine Kershaw (Psychology Department, University of Alberta)

Intergroup leadership, a leader who represents a group with distinct subgroups, is a common situation
for many companies, teams, and political groups (e.g., Deans provide leadership to many university departments). Addressing groups with strong divisions between distinct subgroups is a difficult task for a leader; the leader needs to unite the subgroups without provoking intergroup conflict by threatening subgroup distinctness. Three studies (Ns = 393) were conducted to compare three prominent intergroup relations theories: the common ingroup identity model, social identity theory of intergroup leadership, and the dual identity hypothesis. We were interested in whether leadership rhetoric promoting a superordinate identity, intergroup relational identity, or dual identity was impacted by feelings of identity threat among the subgroups. We found that as feelings of identity threat increased, group members were more supportive of a leader that advocated distinct subgroup identities and focused on the positive relation between subgroups that would benefit both subgroups. When group members felt less threatened, however, they were more supportive of the leader who promoted a superordinate identity among subgroups. These results indicate that although addressing groups as one unit is a common practice, it may not be consistently effective when speaking to groups comprised of strongly divided and distinct subgroups.

Speaker 2  Passing Death’s (p-)Curve: A p-Curve Analysis of the DTA Hypothesis
Michael Sharp, Jeff Schimel, & Jamin Blatter (Psychology Department, University of Alberta)

The tendency for academic journals to publish only novel significant findings is well known to psychological researchers and may mask the true nature of an effect. This issue is made more problematic by a lack of replications, leaving false-positives unaddressed. In addition, because academic journals may only publish significant findings, researchers may engage in practices (e.g., p-hacking) that can increase the likelihood to achieve such findings, regardless of whether the effect under investigation truly exists or not. Overall, these tendencies on behalf of both the journals and researchers call into question underlying assumptions of the scientific process. By acknowledging the tendencies of both parties, Simonsohn, Nelson, and Simmons (2014) developed a new method, the p-curve, which tests the evidential value of a collection of published studies. The p-curve analysis tests the distribution of published significant p-values to examine the likelihood that an effect truly exists, is nonexistent, or found due to p-hacking. In this presentation, I will discuss the theory underlying the p-curve. Then, I will review research related to terror management theory, focusing largely on the death-thought accessibility (DTA) hypothesis. Afterwards, I will report a p-curve analysis showing the evidential value of studies investigating the DTA hypothesis. To end, I will discuss the importance of the p-curve analysis in today’s peer-reviewed world.

Speaker 3  The immortality hypothesis: on the human obsession with conquering death
A. Scott, J. Schimel, M. Sharp, J. Blatter (Psychology Department, University of Alberta)

Terror management theory (Greenberg, Pyszczynski, & Solomon, 1986) posits that the awareness of our own mortality leads to anxiety, necessitating robust psychological mechanisms aimed at its resolution. It is hypothesized that by investing in and identifying with cultural worldviews that provide avenues to literal (e.g., afterlife) or symbolic (e.g., legacy) immortality, we are able to alleviate the anxiety arising from the awareness that we will one day die. Previous research has detailed the ways in which death reminders provoke worldview defense; however, few studies have examined the implicit theoretical assumption that cultural worldviews are existentially protective because of their role as immortality projects. I will review findings supporting this underexplored theoretical link as well as some of the implications arising from this perspective.
RC1  Real brains in virtual environments: An investigation of attention in depth using a novel depth P3 task
Room: ECHA 1-131
Eden X. Redman (a), Jonathan W. P. Kuziek (a), Abdel R. Tayema (a), Jeff Murray (c), Jenna Reinen (c), Aldis Sipolins (c), Kyle E. Mathewson (a), (b)
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(c) IBM Research: Education & Cognitive Sciences
Electroencephalography (EEG) research is typically conducted in a highly controlled laboratory setting. However, this often limits the generalizability of results to real-world situations. Contemporary research has shown that alternative means of stimulus presentation can yield results comparable to traditional EEG methods. Currently, we are exploring the use of virtual reality for presenting stimuli within an EEG study. This may serve to characterized brain states in novel or otherwise inaccessible research environments. In the present study we used an HTC Vive head mounted display (HMD) within a Faraday chamber to assess brain states during a novel depth-based P3. For this task, stationary participants responded to either near or far (size-matched) target orbs within a virtual environment. Standard orbs were presented 80% of the time and target orbs only 20%. Typical oddball task EEG waveforms such as the MMN and P3, negative and positive deflections respectively, were elicited following target orb presentation. Additionally, horizontal electrooculography (EOG), fitted to measure eye convergence and divergence, was shown to be related to orb depth. Further research will differentiate how neural activity is modulated by objects presented at varying depths. Additionally, it may also be possible to use informative cues to promote attention at specific depths. Current results suggest that virtual reality can serve as a valid means of stimulus presentation in novel or otherwise inaccessible environments for EEG experimentation.

RC2  Latin in a contemporary setting: A thematic analysis of motivation to learn the classical language
Room: ECHA 1-131
J. W. Katz, K. A. Noels, & A. R. Fitzner (Psychology Department, University of Alberta)
Few studies have examined why people learn classical languages, and none have grounded learners’ reasons within theories of motivations for language learning. We conducted interviews with 12 intermediate to advanced-level Latin learners (M = 39.58, SD = 4.11) to investigate why they chose to learn the classical language. A thematic analysis of interview transcripts revealed nine themes. Some themes were consistent with self-determination theory, including the themes “intrinsic interest” (intrinsic motivation), “sense of prestige” (introjected regulation), and “program requirements” (external regulation), while other themes were consistent with notions of Gardner and Lambert’s model of language learning (e.g., “transferable language benefits” and the instrumental orientation). Other themes have not been addressed in motivational models, and seem specific to learning classical languages like Latin. Some themes addressed by extant motivational models were not evident in the transcripts, or necessitated a reinterpretation of extant
constructs (e.g., the integrative orientation). Given these findings, it would appear that motivation to learn classical languages can be explained using theories of motivation to learn modern languages, however, we did find themes that did not align with characteristics of these theories. For example, “methodological approach to learning” describes facets of Latin that enable people with specific personality characteristics to more easily learn the language. The results of this study are discussed in terms of contemporary theories’ ability to predict motivation to learn classical languages.

**RC3 Predicting Colour Memory Behaviour Based on Evoked Neural and Oscillatory Activity**

Room: ECHA 1-121

Jonathan W. P. Kuziek (Department of Psychology, Faculty of Science, University of Alberta), Abdel R. Tayem (Department of Psychology, Faculty of Science, University of Alberta), Eden X. Redman (Department of Psychology, Faculty of Science, University of Alberta), Jeff Murray (IBM Research: Education & Cognitive Sciences), Alysha Rajaram (Department of Psychology, Faculty of Science, University of Alberta), Jenna Reinen (IBM Research: Education & Cognitive Sciences), Aldis Sipolins (IBM Research: Education & Cognitive Sciences), Kyle E. Mathewson (Department of Psychology, Faculty of Science, University of Alberta & Neuroscience and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta)

Neural activity can be monitored using electroencephalography (EEG), which is indicative of certain mental processes, cognitions, or behaviours. Virtual Reality (VR) may allow greater freedom for creating simulated environments that are more ecologically valid than normal lab settings, potentially allowing for greater predictability of neural activity. The goal of the present study is to employ a colour memory task, using either a VR headset or a traditional computer monitor, while simultaneously recording EEG data. Participants briefly see several coloured objects followed by a colored cue and participants select the object that matches the cue. The participant is given feedback on their selection being correct or incorrect. Throughout this process, we are interested in the oscillatory and evoked activity during the study phase, or an event-related potential (ERP). We expect that the predictive strength of the ERPs and oscillations, with respect to participants’ responses will be greater in VR. Our preliminary results suggest that ERPs and oscillatory activity during study are modulated based on whether or not the task is performed in VR or using a traditional monitor. This activity is also modulated based on the subsequent response of the participant for that particular trial. These results suggest that further study on oscillatory activity and ERP would allow us to make reliable predictions of participant activity, especially within VR. This will allow us to present the participant with feedback or change stimulus features based on their neural activity, which may potentially enhance their performance on a given trial.

**RC4 Similar to me, different to you: Differences in similarity perception of objects between monolingual English speakers and bilingual English-Chinese speakers**

Room: ECHA 1-121

K. Koh & T. Masuda (Psychology Department, University of Alberta)

The linguistic relativity hypothesis posits that language influences thought and perception. In the proposed study, we assume that perceived similarity between two objects that are referred to by the same word in one language, but by two words in another, will be used to assess the linguistic relativity hypothesis. Fifty monolingual English speakers and fifty bilingual English-Chinese speakers will be recruited from the psychology pool at the University of Alberta. Participants will view several pairs of object images and rate how similar they perceive each pair to be on a scale of 1 to 7. Monolingual participants will do the study in English, while bilingual participants will do the study in Chinese. In some pairs, the two object images use the same word in English, but different characters in Chinese, to describe them. For these pairs, we expect that perceived similarity between the objects is expected to be higher in monolingual English speakers than bilingual English-Chinese speakers. In the remaining pairs, the two object images use the same characters in Chinese, but different words in English, to describe them. For these pairs, we expect that perceived similarity
between the objects is expected to be higher in bilingual English-Chinese speakers than monolingual English speakers. A significant result will show that the language individuals speak influences their thought patterns, specifically perceived object similarity. This research will address a gap in the intricate dialogue regarding the linguistic relativity hypothesis and provide evidence that cultural differences exist.

Keywords: Linguistic relativity hypothesis, Culture, Similarity perception, Bilingualism.

RC5  A ride in the park: Cycling in different outdoor environments affects the auditory N1
Room: ECHA 1-125
J. E. M. Scanlon, E. Redman, K. E. Mathewson (Psychology Department, University of Alberta)

Mobile EEG allows the investigation of brain activity outside of the lab and in increasingly complex environments. In this study, EEG equipment was adapted for use and transportation in a backpack while cycling. Participants performed an auditory oddball task while cycling outside either in a quiet park or near a noisy roadway. In both conditions, we were able to accurately measure reliable event related potentials (ERP). The P3 was similar in topography, and morphology, with no differences in amplitude between conditions. An increased N1 amplitude was observed when evoked by both standards and targets while cycling by the noisy roadway compared with the quiet park. This may be due to an attentional process in which the brain emphasizes the processing of sounds the individual considers to be important or interesting, in order to attempt to perform the task in a noisy environment at an equivalent quality as when they were in the quiet park. No behavioural differences were found between environmental conditions, indicating that this process is an effective compensatory mechanism. This study established methods for mobile recording of ERP signals in outdoor natural environments. Future directions include investigating the auditory N1 and other ERP components in more rigorous and ecologically valid studies outside of laboratory.

RC6  Using a deep artificial neural network to classify Veromessor pergandei trajectories when displaced from their feeding column
Room: ECHA 1-125
M. E. Cselinacz, E. Schumacker Soares, M. Spetch (Psychology Department, University of Alberta), & V. Bulitko (Computing Science Department, University of Alberta)

Ants display different travel patterns depending on many factors including their habitat and where they are displaced from their nest, such as landmark-rich versus bare habitats (Narendra et al., 2008; Cheng et al., 2014). Specifically, Veromessor pergandei ants have significantly different trajectories depending on where they are displaced from their feeding column – at 25% or 75% away from the nest, or at the foraging fan (Spetch et al., in preparation). To confirm the differences, deep learning was used to see if an artificial neural network could detect differences between ant trajectories from different displacements. A deep artificial neural network was trained with approximately 70% of the ant trajectories from each of the positions they were displaced from the feeding column, and then tested on the other 30% of the trajectories to see how accurately it classified the new trajectories. An additional set of 23 ant trajectories was also tested on, using 100% of the trajectories to see how the network dealt with novel images. The procedure was then reversed, with the network being trained with 70% of the 23 trajectory set and tested with 100% of the 28 trajectory set. Overall, results indicate a statistically significant difference between the different ant trajectories as recognized by the artificial network; that is, the network could recognize a trajectory of a certain displacement as belonging to that displacement. The results encourage future research on using deep artificial neural networks to classify other behaviors in humans and animals.

RC7  Affect of Acute Exercise on Spatial Navigation
Room: ECHA 1-144
Danielle Olafson, Ford Burles, Dr. Giuseppe Iaria, Dr. Kyle Mathewson, Dr. Claire Scavuzzo
Aerobically fit individuals have been shown to consistently out-perform their sedentary counterparts on cognitive measures. Hippocampal tissue is particularly sensitive to the neurogenic and metabolic enhancements mediated by exercise in general. During high intensity exercise interventions, the hippocampus adapts physiologically by increased volume, vascularization, and metabolism. Additionally, the hippocampus adapts behaviourally through improved spatial learning and memory. We tested how acute high intensity exercise influenced hippocampal sensitive performance of a spatial configuration task (SCT). Immediately following a bout of acute high intensity exercise on a spin bike, subjects showed learning enhancements in the SCT compared to low intensity exercise controls (n=20). We believe that these cognitive enhancements are mediated by acute increases in blood and brain lactate. As a follow up, we plan on measuring both peripheral and neural lactate following acute high intensity exercise and comparing this measurement to performance on the SCT. Lactate has been shown to act as an alternative to glucose, and powers the energy needs of neurons. Hippocampal neurons seem to utilize lactate as fuel far more efficiently than other tissues in the brain. Thus, we predict higher rates of hippocampal based spatial improvement succeeding acute high-intensity exercise as this is expected to produce more metabolic substrates, in the form of lactate.

**RC8  The effect of different stressors on the behaviour of both wild-reared and captive-reared convict cichlids (Amatitlania nigrofasciata)**  
Room: ECHA 1-144  
Emily Frey, Michele Moscicki (Psychology department, University of Alberta), Pete Hurd (psychology department, University of Alberta)

We studied the behavioural responses of both wild-reared and captive-reared convict cichlids to different stressors (i.e., the presence of a live predator, Gobiomorus dormitor, or the presence of alarm cues without an actual predator present). In a quasi-experimental design, we assessed where fish fall along the shy-bold continuum using an emergence task. Subsequently, fish were assessed for behavioural responses in an open field task when exposed to different types of stressors. Specifically, we calculated the amount of time spent in various areas of the tank (i.e., corner, edge, and middle squares). Finally, for wild-reared fish, we also calculated the proportion of time fish spent facing the predator with either their right or left eye. Our main findings included a significant difference in emerge time between wild-reared and captive-reared fish. In addition, we found a significant interaction between sex and stress treatment on time spent in various areas of the open field tank. Furthermore, we found significant relationships between emerge time in the boldness task and time spent in various areas of the open field in female fish only. Lastly, we found a significant relationship between emerge time and eye used to view the live predator in wild-reared fish. Possible explanations for the sex and stress differences we found will be discussed: these include freezing behaviour as a survival strategy and potential sex differences in either sensitivity to or responses to stressful situations.
T5 Feedback Error-related Negativity as a Control Signal for the Attention System  
*D. Robles & Kyle E. Mathewson (Psychology Department, University of Alberta)*

The Feedback Error-related negativity (fERN) is an event related potential (ERP) component associated with error feedback regarding incorrect motor responses in experimental tasks and it is characterized by a negative decrease of amplitude approximately 200 ms after feedback onset. Here we investigated in a novel task whether this component is involved in feedback about the outcome of shifts in covert attention. In order to explore the impact of rewards and losses in attentional processing, thirteen participants completed a modified two-arm bandit task. Such tasks randomly switch the probability of obtaining a reward from a set of two squares and provides participants with feedback for each time they chose a square. We recorded ERPs over frontal brain regions (FCz) evoked by the feedback that participants received in each trial. Preliminary results show that on loss trials participants display a pronounced fERN that is not present for winning trials. These results are consistent with previous studies exploring error feedback in ERPs. It has been proposed that the ERN component is an adaptive preparatory response to negative reinforcement originated in dopaminergic areas that allows for motor adjustments in task performance. A modified version of a bandit-task in which the response is a lateralization of attention is currently being developed in order to test if this same dopaminergic system is involved in the control of covert attention.

T6 A Workout for your brain - Neurofeedback training to develop the capability to modulate one’s own brain activity  
*McKenzie A.C. (Department of Psychology, University of Alberta), Sheldon S.S. (Department of Psychology, University of Alberta), & Mathewson, K.E. (Department of Psychology, University of Alberta; Neuroscience and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta)*

Performance on cognitive tasks can be altered via manipulation of brain waves in the frequency range of 7-12 Hz. This frequency range is referred to as “Alpha” and it plays an important role in cognitive performance in addition to the perception, attention, and detection of visual stimuli. Previously published literature has demonstrated that various aspects of alpha frequency can be modulated through reinforcement via a real-time neurofeedback paradigm. The purpose of this study is to investigate if individuals have the ability to improve relative performance on a visual detection task. Some participants will be increasing alpha, others decreasing alpha, and the control group will receive sham feedback. All participants will have their baseline alpha power recorded during a one minute “eyes open” (looking at a monitor and not doing anything) period before performing a target detection task involving perception of visual stimuli presented briefly. Participants then undergo a training session composed of 5 blocks of 5 minutes of neurofeedback training in which they attempt to change their alpha power. In between the blocks, the baseline level of alpha will be changed to the average of the last minute of the previous block. In this way the threshold for altering alpha is always changing to ensure the largest training effect is seen in brain activity. During training participants are presented with a box on a computer screen and EEG is recorded and analyzed in real-time. If the alpha
power is above the baseline threshold then the box will fill with color. After feedback training, the cognitive task is performed again and any changes detection rates are noted and analyzed. We predict that increasing alpha will decrease detection and vise versa. The ability to control oscillations and modify behavior is an important tool for both neuroscience research and also technological applications outside the lab.

**T7 Metabolic modulation of brain states and memory**

C.J. Scavuzzo (Psychology Department, University of Alberta), I.H. Rakotovao (Psychology Department, University of Alberta), A. Shienh (Psychology Department, University of Alberta), C.T. Dickson (Psychology Department, Neuroscience and Mental Health Institute, University of Alberta)

Slow wave states of sleep are associated with enhanced memory consolidation processes. Previously we have shown that systemic L-lactate, a metabolic substrate, increases slow wave brain states under urethane anesthesia. To assess if long lasting increases in slow wave states following systemic L-lactate administration contributes to memory processing, rats were trained on the inhibitory avoidance task and given immediate post training injections (s.c.) of L-lactate or saline. Lactate-treated rats showed significant memory enhancement compared to controls, suggesting that the metabolic substrate supports memory enhancements. Future studies will investigate if post training L-lactate injections influence slow wave EEG states, and/or ongoing waking or sleeping behaviours, and if the change in brain state or behaviour induced by lactate, contributes to future memory performance.

**INVITED INTERNAL ADDRESS**

**Improving Children’s Understanding of the Equal Sign: From Experimental Control to Chaos and . . . Maybe Beyond?**

Dr. Jeff Bisanz

University of Alberta

In psychological research we typically start with a phenomenon we do not understand and then we conduct a series of studies to help us understand that phenomenon better. In the present case the approach is somewhat different: We started with a phenomenon that was fairly well understood psychologically, and we then conducted a series of studies to explore what it takes to move from psychological understanding to having an impact outside our laboratory on, in this case, children's learning. The vast majority of children in elementary school solve equivalence problems, such as “2 + 4 + 6 = 7 + __”, incorrectly, despite being perfectly able to perform the necessary calculations. They fail because they interpret the equal sign in an operational manner (“put the answer next”) rather than in a relational manner (“the sum of the numbers to the left of the equal sign is equal to the sum of the numbers to the right”). A team of researchers at the University of Alberta and Concordia University undertook a series of studies (a) to identify and test methods for improving children's performance, (b) to design and test instructional methods that could be used in classrooms, and (c) to implement and test those instructional methods using online professional development for teachers. At each step the instructional interventions we tested produced sizeable increases in children's performance. Lessons were learned during the process of “scaling up” from small-scale experimental and developmental investigations to effecting instructional change broadly in classroom environments.
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