

28th Annual Joseph R. Royce Research Conference

Department of Psychology
University of Alberta

March 28, 2014

<http://www.psych.ualberta.ca/royce/>

Keynote Address by

Mark Fenske, University of Guelph

Invited Presentations by

Fred Colbourne, University of Alberta

Don Heth, University of Alberta

Invited Symposium

Brain activity and behaviour (Chair: Clayton Dickson, University of Alberta)

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Program in Brief

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Rodent studies on the course of injury and recovery after hemorrhagic stroke
Fred Colbourne (University of Alberta)
- 9:30-10:30 **Session 1** (ECHA L1-430)
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- 9:30 Can infants use the acoustic correlates of prosody to parse a musical melody?
K. Hawthorne (University of Alberta) & L. A. Gerken (University of Arizona)*
- 9:45 The role of cultural experience on children's understanding of musical meter
J. Skolney & T. Vongpaisal (Grant MacEwan University)*
- 10:00 Predicting gesture use: Does age matter?
R. Furman & E. Nicoladis (University of Alberta)*
- 10:15 Understanding human actions as the observable component of cognition
C. S. Chapman (University of Alberta)
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Chair: Clayton Dickson
- Hippocampal theta as a biomarker for anxiety
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- The occurrence (and potential impact) of seizure activity following intracerebral hemorrhage
A. C. Klahr, C. T. Dickson, & F. Colbourne (University of Alberta)*
- Entraining (and consolidating?) memory-related hippocampal activity during slow wave states
A. Greenberg & C. T. Dickson (University of Alberta)*
- Memory consolidation: Activity dependence versus molecular dependence?
M. J. LeBlanc, T. L. McKinney (University of Alberta), T. J. Hamilton (Grant MacEwan University), & C. T. Dickson (University of Alberta)*
- The influence of Japanese culture on episodic memory-related brain activity and behaviour
M. J. Russell, T. Masuda, Y. Chen (University of Alberta), K. Hioki (Kobe University), & J. B. Caplan (University of Alberta)*

* Presenting author

- 12:00-1:30 **Poster Session and Lunch** (outside ECHA L1-490)
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When the earth is flat: Steps towards a naïve geography
Don Heth (University of Alberta)
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- 2:15 Rapid naming deficits in university students with dyslexia: A challenge for the anchoring-deficit hypothesis
G. K. Georgiou & R. Ghazyani (University of Alberta)*
- 2:30 Examining the factor structure of executive functions and its association to complex problem solving.
J. P. Das & G. K. Georgiou (University of Alberta)*
- 2:45 A comparison of various measures of transparency in English compounds
K. Nisbet, C. L. Gagné, & T. L. Spalding (University of Alberta)*
- 3:00 The role of different types of internet usage on the loneliness among undergraduate students
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- 3:15-3:30 Coffee Break and Poster Viewing (outside ECHA L1-490)
- 3:30-5:00 **Keynote Address** (ECHA L1-490)
Harnessing the brain's cognitive-affective interface to enhance self-regulation
Mark Fenske (University of Guelph)

* *Presenting Author*

Conference Organizing Committee

Sandra Wiebe (co-chair)
Jeremy Caplan (co-chair)
Sarah Elke
Matt Russell
Shannon Wowk
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Acknowledgment

The Royce Conference Organizing Committee thanks the Faculty of Arts, the Faculty of Science, the Office of the Vice-President (Research), and Pearson Canada for their generous support. We would also like to thank Kim Noels, Elena Nicoladis, and Pete Hurd for judging the Best Student Paper competition.

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- P02 **Examining switch costs in children**
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- P03 **Is order information built in to memory for associations?**
K. Kato & J. Caplan (University of Alberta)*
- P04 **What it takes to be an adult: Necessary versus sufficient criteria**
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- P06 **Can embodied cognition help preschoolers escape perseveration?**
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- P07 **Trajectories and predictors of happiness across 25 years: Findings from the Edmonton Transitions Study**
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- P08 **“Don’t buy” or “Do not buy”? When negation processing leads to conflicting product evaluations**
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J. Paquet, H. Hoang, E. Nicoladis & R. Furman (University of Alberta).*
- P11 **The effect of inducing time pressure on response inhibition in early childhood: An ERP study**
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- P17 **Teacher-child relationship quality and internalizing problems in early elementary school: The role of classroom emotional support**
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- P18 **ZENK expression in response to conspecific D notes in hand-reared black-capped chickadees**
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- P19 **An examination of ethnic groups' perceptions of being stereotyped in Canadian society**
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- P20 **Developing a pigeon model of human gambling**
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- P21 **Functional role of amygdala: A high-resolution functional magnetic resonance study of emotional processing**
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- P22 **A verification of octave equivalence in humans**
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- P24 **Features indicating sex of the caller in the chick-a-dee call of black-capped chickadees (*Parus atricapillus*)**
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- P25 **Evaluating the impact of academic mentorship on high school student researchers**
J. W. Canning & E. L. Kartes* (University of Alberta)*
- P26 **The peg list method can support memory for associations**
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- P27 **Future-oriented processing and children's understanding of self-regulation strategies**
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- P28 **Examining correlations between general sense of belonging, school sense of belonging, and Facebook use**
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- P29 **Civic engagement, work rewards, and being generative in midlife**
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- P30 **Ukrainian heritage language maintenance in Ukrainian-Canadians**
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- P31 **Rapid makes risky: More risky choices for speeded decisions**
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- P32 **Further support for the efficacy of intrinsic religiosity in buffering against existential anxiety**
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- P34 **Chickadee vocal response to threat-level varies with signaler**
*J. V. Congdon**, *A. H. Hahn*, *N. McMillan*, *M. T. Avey*, & *C. B. Sturdy (University of Alberta)*
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- P37 **Lifetime orientation and social motives in dementia**
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- P38 **Self-determined classroom engagement in Turkish adult learners of English**
*A. Dincer** (*Erzincan University*) & *K. A. Noels (University of Alberta)*
- P39 **Zip it: Zeta inhibitory peptide effectively shuts up the hippocampus**
*T. McKinney**, *M. LeBlancq*, & *C. Dickson (University of Alberta)*

** Presenting author*

Invited Presentation (ECHA L1-430)

9:00 **Rodent studies on the course of injury and recovery after hemorrhagic stroke**

Fred Colbourne (University of Alberta)

Approximately 15% of all strokes result from an intracerebral hemorrhage (ICH). There are few treatment options for this devastating stroke, but through the use of animal models substantial progress has been made in our understanding of the timing of cell death, deleterious mechanisms underlying it, and the restorative changes that ensue. In my talk I will discuss research from my lab that uses rat models of ICH to explore these issues. I will also discuss our attempts at limiting brain damage and improving functional recovery through a variety of treatment strategies from neuroprotectants to rehabilitation. The translational challenges faced in this difficult research area will be emphasized.

Session 1 (ECHA L1-430)

9:30 **Can infants use the acoustic correlates of prosody to parse a musical melody?**

K. Hawthorne (University of Alberta) & L. A. Gerken (University of Arizona)

In spoken language, particularly of the infant-directed variety, clauses are marked with prosodic cues, such as final lengthening and pitch resets at boundaries (e.g., Soderstrom et al., 2008). Though prosody is specific to language, similar acoustic cues mark phrase boundaries in music, and infants are sensitive to the correlation of these cues at musical boundaries (Jusczyk & Krumhansl, 1993). In the present study, we ask whether younger (4-month-old) and older (16-month-old) infants can use prosody-like boundary cues to facilitate recognition of music phrases. In a musical extension of Soderstrom et al. (2005), infants were familiarized with one of two brief melodies, then were tested using the head-turn preference procedure on their ability to recognize a phrase versus phrase-straddling excerpt from the familiarization melody when it is embedded in a new musical passage. Preliminary results suggest that younger infants show a familiarity preference for the test melody containing a phrase from the familiarized melody, while older infants do not discriminate between the test item types. This suggests that young infants use prosody-like cues to group acoustic stimuli in a domain-general way whereas older infants may not.

9:45

The role of cultural experience on children's understanding of musical meter

J. Skolney & T. Vongpaisal (Grant MacEwan University)*

This study explored the role of cultural experience on children's developing counting skills in music. Child (4-7 years, 8-13 years) and adult participants were presented 10 song clips from Western music and 10 song clips from South Asian music, both of which have 3-beat and 4-beat meter structures. Participants were asked to count along with the music and determine whether the song was based on 3-beat cycles or 4-beat cycles by matching the song to an image of a triangle or an image of a square, respectively. We tested adults and children of both Western and South Asian cultural background to track the role of listening experience and the developmental course of meter perception. We hypothesized that participants with experience listening to South Asian music would perform similarly in both conditions, while participants with experience listening to only Western music would perform best in the familiar Western music condition. Our findings are in line with our initial predictions; adults with South Asian music listening experience performed equally well at identifying meter across conditions, whereas adults with only Western music experience showed an advantage in identifying meter in the Western music condition. In contrast, children with South Asian music experience performed better in the South Asian music condition, while children with only Western music experience performed better in the Western music condition. Equal proficiency for the adults with South Asian music experience suggests that adults have better developed bimusicality than children.

10:00

Predicting gesture use: Does age matter?

R. Furman & E. Nicoladis (University of Alberta)*

Previous research has suggested that between the ages of six and adulthood, the use of gestures while telling a story increases (Colletta, Pellenq, & Guidetti, 2010). Over this age range, however, there are many aspects of storytelling that change, including the length of the story and preference for present tense. These variables have been linked with gesture use independently of age. In the present study, sixty-four people between five years and adulthood were asked to watch a cartoon and tell the story back. Half of the participants were monolingual anglophones and half monolingual francophones, matched by age. We calculated the length of participants' stories (in number of words used to tell the story), and the percentage of verbs to recount story events that were in the present tense. There were no significant differences between anglophones and francophones on any of the measures (including gesture use). As expected, the story length and the use of the present tense increased with age in both language groups. We examined the effect of age on gesture rate while controlling for story length and use of the present. For both anglophones and francophones, neither age nor story length was significantly related to gesture use. The use of the present tense was the only factor that significantly influenced gesture use for speakers of both languages. We discuss these results in terms of the vivid visuo-spatial imagery underlying the use of both the present tense and gestures.

10:15

Understanding human actions as the observable component of cognition

C. S. Chapman (University of Alberta)

Conventional thinking characterizes human behaviour as a serial process: first we receive external stimuli (Perception), then we process and select relevant information (Cognition) and finally we produce movements (Action). But something as simple as a poker game tells us this cannot be true – players struggle to maintain a poker face while trying to read other players' poker tells. That is, there is a common understanding that moving is part of thinking. In this talk, I will explore how action is best understood as an observable component of cognition, rather than an isolated, last step in a serial process. I will explore the specific example of human decision making. Usually, decision making research is restricted only to an analysis of what decisions people make. This approach overlooks the very important component of how people execute their decision. In this talk, I will show that an analysis of the physical reach movements people make to indicate a decision can reveal subtle and important aspects of decision making that would have been invisible using conventional research methods.

Invited Symposium (ECHA L1-430)

10:45-

Brain activity and behaviour

12:00

Chair: Clayton Dickson

Brain activity is imperative for behaviour, but it can be essential for influencing future behaviour in situations when there is no direct brain-behaviour link. In this symposium, presenters will discuss how measures and manipulations of brain activity are related to present and future emotional responding, outcome following stroke, and memory.

Hippocampal theta as a biomarker for anxiolysis

M. Yeung, D. Treit, & C. T. Dickson (University of Alberta)*

The occurrence (and potential impact) of seizure activity following intracerebral hemorrhage

A. C. Klahr, C. T. Dickson, & F. Colbourne (University of Alberta)*

Entraining (and consolidating?) memory-related hippocampal activity during slow wave states

A. Greenberg & C. T. Dickson (University of Alberta)*

Memory consolidation: Activity-dependence versus molecular dependence?

M. J. LeBlanc, T. L. McKinney (University of Alberta), T. J. Hamilton (Grant MacEwan University), & C. T. Dickson (University of Alberta)*

The influence of Japanese culture on episodic memory-related brain activity and behaviour

M. J. Russell, T. Masuda, Y. Chen (University of Alberta), K. Hioki (Kobe University), & J. B. Caplan (University of Alberta)*

Invited Presentation (ECHA L1-430)

1:30 When the earth is flat: Steps towards a naïve geography

Don Heth (University of Alberta)

As our everyday use of technology becomes more dependent on spatial tools—such as Google Maps or Microsoft Earth—it has been suggested that the presentation of spatial information should match our commonsensical or "naive" conceptions of geography. An understanding of Naive Geography could inform our development of next-generation Geographic Information Systems as well as help develop a natural ontology of the environment. This talk will describe studies of students' conception of the University of Alberta geography, in which some of the elements of Naive Geography are apparent. This information could be of help in developing tools for emergency management.

Session 2 (ECHA L1-430)

2:00 **Measuring number-line knowledge**

C. Piatt, M. Coret, J. Volden, & J. Bisanz (University of Alberta)*

We explored the relation between what students know about number lines and their number-line estimation abilities. To measure students' conceptual knowledge of number lines (Knum), we designed a 9-item questionnaire asking about concepts like scale changes (What number goes in the middle if this endpoint changes from 100 to 1000?) and equal intervals (Does the space between 90 and 91 have to be the same as the space between 10 and 11, or can it be bigger or smaller?). Twenty-four students in each of Grades 2, 4, and 6 estimated targets on 0-to-100 and 0-to-1000 ranges and completed the questionnaire. Knum scores increased with grade ($M = 3.96$ in Grade 2, $M = 5.32$ in Grade 4, and $M = 7.08$ in Grade 6). Higher Knum scores were associated with a decrease in estimation error for both ranges, even when controlling for grade ($r = -.43$ for 0-100 and $r = -.48$ for 0-1000, $ps < .01$). We also classified students' number-line estimation procedures in terms of their increasing sophistication. Students with higher Knum scores used more advanced procedures (proportionally estimating, for example, 33 on a 0 to 100 line) as compared with less advanced procedures (for example, counting up from 0 to find 33). Previous studies have demonstrated that students' accuracy on number-line estimation may be related to using an underlying linear representation of the number-line range. Here we illustrate that successful number-line estimation is also clearly related to conceptual and procedural knowledge about the number line.

2:15

Rapid naming deficits in university students with dyslexia: A challenge for the anchoring-deficit hypothesis

G. K. Georgiou & R. Ghazyani (University of Alberta)*

According to the perceptual anchor hypothesis of dyslexia, children with dyslexia show deficits in phonological processing tasks not because they have auditory or phonological impairments, but because of difficulties creating a ‘perceptual anchor’ in tasks that rely on a small set of repeated stimuli (Ahissar, 2007). Based on this we could hypothesize that rapid naming deficits should only be present in small sets of repeated items, not in large sets of unrepeated items. We sought to examine this hypothesis by comparing the performance on the rapid naming of a small set of repeated items with that of a large set of unrepeated items. Twenty-five university students with dyslexia and 30 controls were tested on two conditions of digit and object naming. Condition 1 consisted of 5 stimuli repeated 16 times and condition 2 of 20 stimuli repeated only 4 times each. The results showed that dyslexics were performing slower than controls on both the small and large sets of digits and objects. Importantly, the deficit was bigger for large sets than for small sets, which is the opposite of the prediction made by the anchor-deficit hypothesis. To conclude, the perceptual anchor theory does not seem to adequately explain some of the major hallmark effects of developmental dyslexia.

2:30

Examining the factor structure of executive functions and its association to complex problem solving

J. P. Das & G. K. Georgiou (University of Alberta)*

Executive functions (EF), defined broadly as the ability to regulate mental functions have been found to predict academic achievement (Chung et al., 2012; van der Ven et al., 2011). However, there is disagreement about the underlying factor structure of EF. Some researchers have suggested that EF is made up of three factors (shifting, updating, and inhibition), some others separated “shifting and inhibition” from “updating”, and some others demonstrated that all EF measures load on one factor. In addition, very little is known about what component(s) of EF predict complex problem solving. Thus, the purpose of this study was to contrast different factor structures of EF and examine what component of EF predicts complex problem solving. 186 (136 females, mean age = 22.70 years) university students were assessed on a set of inhibition, shifting of attention, updating tasks as well as on Crack the Code (a problem solving task). To examine the factor structure of EF we performed a set of confirmatory factor analyses. The results of CFA indicated the best-fitting model was the three-factor model (inhibition, shifting of attention, and updating) with the three factors correlating strongly with one another. In addition, only shifting predicted Crack the Code. These findings are in line with Miyake and colleagues’ (2000) findings and highlight the importance of recognizing both the unity and diversity of EF.

2:45

A comparison of various measures of transparency in English compounds

K. Nisbet, C. L. Gagné, & T. L. Spalding (University of Alberta)*

Semantic transparency plays a central role in psycholinguistic theories regarding the processing and accessibility of multi-morphemic words in the mental lexicon. Our research focuses primarily on compound words, which consist of more than one constituent (e.g., hog + wash). These constituents can vary in their degree of semantic transparency; semantically opaque constituents (e.g., blockbuster) do not contribute to the compound's meaning, whereas transparent constituents do (e.g., blueberry). Semantic transparency, as a theoretical construct, plays an essential role in many explanations of compound processing and has led to important insights into the human lexical system. However, there is great variability among researchers' operational definitions of semantic transparency, resulting in difficulty comparing findings. The aim of our study is to compare and evaluate the three most common measures of semantic transparency (linguistic classification, Latent Semantic Analysis (LSA), and participant ratings) to determine whether they reflect the same underlying construct. The data show that participant ratings cannot be predicted from either LSA scores or linguistic classification. This finding indicates that these measures do not reflect the same underlying aspects of semantic transparency; people rely on more than just word associations and linguistic properties when making judgments about semantic transparency. The results suggest a process of meaning construction that draws on multiple sources of conceptual, semantic, and morphological information.

3:00

The role of different types of internet usage on the loneliness among undergraduate students

S.H. Daly & S.L. Ziolkowski (University of Alberta)*

The internet is a popular way for young adults to spend their time, socially and independently, and although the use of this medium has positively impacted our access to information, it has also been linked with addictive behaviour. This study examines the connection between Problematic Internet Usage (PIU) and loneliness among undergraduate students in an effort to show the pattern of usage that puts students at risk for loneliness. Loneliness is a normal experience that increases self-awareness, and is not caused by being alone, but by being without a subjective set of relationships (Ozdemir & Tuncay 2008). PIU is characterized by impulsive access to the internet, which can enhance the possibility of loneliness and depression (Bulut Serin 2011). Many university students experience adaptation issues from developing new social circles, and balancing relaxation and diligent study, difficulty in managing these adaptations can result in the increased risk for addictive behaviour. Surveying undergraduate students from introductory psychology courses, this study measured loneliness, attitudes towards internet use, and thoughts about personal internet use, as well personal duration, frequency and reason for use. Findings suggest that the reason for use has a significant effect on impulsive and distracted use. Loneliness and PIU can pose a great problem for both the mental health and productivity of a university student, but if problematic behaviours are reduced then students can maintain a healthier relationship with the internet and friends and family.

Keynote Address (ECHA L1-490)

3:30 **Harnessing the brain's cognitive-affective interface to enhance self-regulation**

M. Fenske (University of Guelph)

Functional specialization within the brain results in a variety of neural signals that constantly compete to determine what will become the focus of our thoughts and actions. Resolving this battle in the brain requires that some signals are given priority over others according to our current and long-term goals and our evaluation of the emotional and motivational significance of our surroundings. Such evaluations guide cognitive processes, including attention and response selection, to direct our efforts toward objects and events that are helpful and away from those that are not. Cognitive control is also needed to resolve conflict when different emotion- or motivation-related signals compete to drive behaviour. Work in my lab explores the nature of these interactions between cognition, emotion, and motivation. Our recent studies explore how we can use our understanding of the cognitive-affective brain to enhance self-regulation and address emotion- and motivation-related impairments

Poster Abstracts

P01 **Humour styles and peer status in an after-school centre**

B. Poulette & E. Nicoladis (University of Alberta)*

The individual and social benefits of humour have been widely studied in adults and children. These studies showed a positive relationship between humour production and social status, regard amongst peers, and leadership qualities. Recently, research with adults further identifies humour styles. In adults, positive humour styles are related to positive interpersonal relationships, whereas negative ones relate to loneliness and aggression. The present study extends this approach to children by assessing them on sociometric measures and comparing these scores to observed tendencies in humour style. Much of the previous research on children has focused on an individual's ability to produce or appreciate humour via measures of self-report. A total of 22 children between the ages of 5 and 7 years were asked to rate their peers in a sociometric test, and then were videotaped at their after-school centre for a total of 40 hours during minimally supervised normal playtime. Coders watched the videotapes and identified instances of humour use, classified by humour style. The results indicated that children who used an aggressive humour style were highly likely to be listed as being victimized, infrequently mentioned as leaders on the sociometric measure, and rarely included in peer groups. The children who used a positive humour style tended to be mentioned infrequently on the sociometric measure, but were more socially inclusive and less victimized by peers. No significant correlation was found between any humour style and popularity or leadership. Thus, the same general patterns found in adults are already present in young children.

P02 **Examining switch costs in children**

T. Harrison, S. Elke, M. Khoei, A. Abdul Rahman, & S. A. Wiebe (University of Alberta)*

Set-shifting, our ability to flexibly change behaviour in response to the surrounding environment improves substantially in childhood. We used the advanced dimensional change card sort task (A-DCCS; Zelazo, 2006) to examine switching accuracy and reaction time (RT) across two age groups (4-5 vs 6-7 years). We examined two types of switch costs: general (related to holding two rules in mind) and specific (related to switching rules in consecutive trials). We also tested whether the type of task being performed (colour vs. shape) played a factor in the children's ability to switch, as previous research has found that switch costs may be asymmetrical (Ellefsen et al., 2006). Preliminary analyses were conducted in a sample of 38 children. As expected, performance improved with age and children showed both general and specific switch costs. Asymmetrical switch costs were found for RT, such that switch costs were significant only for colour. This pattern of results may be due to task set inertia (Ellefsen et al., 2006), where the easier task set is more readily primed. Consistent with this interpretation, general patterns of performance suggested that children generally found the colour task easier.

P03 **Is order information built in to memory for associations?**

K. Kato & J. Caplan (University of Alberta)*

A major goal of memory models is to understand how people store and retrieve memory for associations (e.g., SALT-PEPPER). An overlooked question is whether the order information (was it STEPHEN-HARPER or HARPER-STEPHEN?) is a fundamental property, or must be learned separately, from associations. The two dominant mathematical operations for learning associations make opposite predictions: matrix models assume order is inseparable from the association; that is, A-B is completely unconfusable with B-A. In contrast, convolution models cannot distinguish order at all; that is, A-B is identical B-A. We therefore tested the relationship between memory for associations and memory for the order of items within associations. Participants studied word-pairs and were tested with standard cued recall, followed by associative-recognition tests. One group (Order) had to attend to the order within associations (Order group) and the other group (No-Order) could attend only to the pairings, without regard to order. With N=90 in total, the groups had very similar performance in general. In particular, cued-recall accuracy was almost the same, implying that attending order information does not require extra effort. However, the accuracies of the reverse judgment (presenting B-A to be judged as reverse) in the recognition test was better in Order group than in No-Order group. This fact implies that remembering the order in associations requires extra effort. Convolution models may explain the No-Order group better, because their associations were not learned along with very much order information. However, when constituent-order matters, convolution might need to be supplemented somehow, but with the constraint that it does not come at a cost to association-memory.

P04 What it takes to be an adult: Necessary versus sufficient criteria

S. Paton, B. Nicolas*, D. I. Vargas Lascano, & L. Daniels (University of Alberta)*

Over the past century, the transition to adulthood has changed dramatically. Continuation of education after high school, delays in the age at which young people get married and become parents, and increased heterogeneity in the order in which role transitions are experienced have prompted a debate among social scientists over the characteristics people use when defining adulthood in contemporary times. Indeed, research shows that role transitions (e.g., having a child), which were traditionally considered the most important markers of adulthood, are no longer the markers most endorsed as criteria of adulthood. Instead, more emphasis is placed nowadays on individualistic criteria (e.g. being financially independent) as markers of adulthood. Research, however, has not taken into account how wording of instructions when asking about key marker of adulthood may influence which criteria are endorsed. The present study extends previous research by examining whether asking for criteria necessary to consider someone an adult versus criteria sufficient to consider someone an adult results in differences in the endorsement rates of role transition and individualistic criteria. Pen and paper questionnaires about conceptions of adulthood and other age and aging related beliefs were completed by 300 participants. Participants were randomly assigned to a control condition or one of two experimental conditions (necessity instructions or sufficiency instructions) for the wording of the conceptions of adulthood questions. Results suggest that endorsement rates for traditional markers and individualistic markers of adulthood depend on whether it is a question of necessity or sufficiency. The implications of the observed patterns are discussed.

P05 The effect of sexual distraction on driving

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Driver distraction is estimated to be one of the leading causes of motor vehicle accidents. Roadside billboards containing negative and positive emotional content have been shown to have differential effects on driving performance, however little is known about the impact of taboo information on driving. Taboo (e.g., sexual-related) information have been shown to more reliably evoke emotional arousal than other types of emotional information. This is important because evidence suggests that taboo stimuli can lead to greater attentional capture, likely due to its 'shock value.' In the present study, we examined the potential for driver distraction from four different types of information presented on roadside billboards: highly arousing taboo words (e.g., orgasm), moderately arousing negative words (e.g., snake), moderately arousing positive words (e.g., angel), and non-arousing neutral words (e.g., prairie). Results showed that positive words were associated with significantly faster driving speeds compared to all the other words, suggesting a facilitation effect associated with positive arousal. However, taboo words were associated with significantly better lane control and memory recall compared to the other words. Taken together, our findings suggest that taboo words captured attention the most, but also led to more conscientious driving, presumably due to participants over-compensating for the greater distraction caused by the taboo words. One implication of these findings is that roadway safety could be improved with a careful consideration for where on the road certain billboard types are placed.

P06 Can embodied cognition help preschoolers escape perseveration?

*J. W. Witzke *, C. Stewart, & S. A. Wiebe (University of Alberta)*

Set-shifting is the ability to switch attention from one dimension (e.g., shape) to another (e.g., colour). For three-year-old children, set-shifting is difficult because they often become stuck on the first set of rules, a phenomenon known as perseveration. This study applies embodied cognition theory, the idea that cognition is rooted in physical or body representations, to develop an intervention to help 3-year-olds overcome perseveration by changing their perspective on the task - literally. In the Dimensional Change Card Sort (DCCS) task, children first sort cards by either shape or color for a block of trials, and then switch to the other category. Children between 3 and 3.5 years of age are assigned to one of three groups. The experimental group swaps chairs with the experimenter to induce a change in perspective for the post-trials. One control group completes the standard DCCS task. A second control group moves but does not change perspective, as they perform a jump in between trial blocks but sit back down in the same chair. Preliminary results (n = 28) indicate that the experimental group outperforms both the control groups. This study could broaden our understanding of set-shifting and sources of perseveration in early childhood.

P07 **Trajectories and predictors of happiness across 25 years: Findings from the Edmonton Transitions Study**

S. Fang, N. L. Galambos, H. J. Krahn, & M. D. Johnson (University of Alberta)*

Recent scientific (Stone, Schwartz, Broderick, & Deaton, 2010) and popular press (Anonymous, 2010) articles proclaim a U-shape in the positive affective component of well-being: happiness declines from age 18 to 46, after which it increases into late life. As most relevant research is cross-sectional, there is almost no evidence to support within-person changes resembling a U-bend. In fact, some longitudinal data show decreased happiness in late life (e.g., Holahan, Holahan, Velasquez, & North, 2008) and improvements in well-being from the teens to mid-20s (Galambos, Barker, & Krahn, 2006). In the longitudinal Edmonton Transitions Study, which tracked over 900 high school seniors from 1985 to 2010, happiness (“Thinking about your life in general, how happy are you?”) was assessed at each each of seven waves, enabling not only examination of age-related change in happiness into mid-life but also potential between-persons (family SES, gender) and time-varying predictors (e.g., unemployment, marriage, social support) of such change. Multilevel models examining growth in happiness found that 66% of the total variability in happiness was within-person; 34% was between-persons. Furthermore, the average trajectory across time showed an increase from age 18 to 32 in happiness, followed by a slight decrease to age 43. Family SES and self-esteem at baseline were predictors of growth trajectory parameters and significant time-varying covariates were identified (e.g., marriage, self-rated physical health). These results do not support a U-shaped function with happiness falling from age 18 to its lowest point in mid-life.

P08 **“Don’t buy” or “Do not buy”? When negation processing leads to conflicting product evaluations**

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This research investigates the novel question of how processing negations—that is, contractions (“isn’t”) versus two-word negations (“is not”)—influences product evaluations. Building on the processing fluency literature, we suggest that the way negations are stated can alter product evaluations. Specifically, contractions are much more common than two-word negations. We confirmed this in a pilot study (N = 200), where we measured the prevalence of contractions (0.52%) versus two-word (0.15%) negations in online consumer reviews. Due to their prevalence, contractions should be processed more fluently than two-word negations. The ease and fluency experienced when reading contractions results in quick and effortless processing—thus, people may not pay attention to contracted negations, resulting in faulty or inaccurate judgments. In contrast, the difficulty experienced when reading two-word negations results in slow and deliberative processing—thus, people may pay attention to two-word negations, resulting in more accurate judgments. In an initial study (N = 75), we tested the effects of contractions (“wasn’t easy to use”) and two-word negations (“was not easy to use”) on product evaluations. We presented participants with identical online reviews about a target product (a camera) that varied only in negation form. We found that in the contraction condition, participants evaluated the target product more positively than in the two-word negation condition. Our findings suggest that the linguistic style of negations can influence judgment above and beyond linguistic content, and provide novel insight into the relationship between human judgment and the cognitive processing of negations.

P09 **Gene x physical activity interactions affect executive functioning in aging: Cross domain longitudinal analyses**

S. Thibau, G. P. McFall, & R. A. Dixon (University of Alberta)*

Objective: We report a gene x environment (vascular health) x lifestyle (physical activity) study focusing on concurrent performance in executive functioning (EF). Specifically, we tested the independent and interactive effects of pulse pressure (PP; a proxy measure of vascular health in older adults) and physical activity level (PA), as moderated by two genotypes related to cognitive aging; brain derived neurotrophic factor (BDNF rs6265) and insulin degrading enzyme (IDE rs6583817). Method: We assembled a group of normally aging, genotyped adults (n = 580, M age = 70.47) from the Victoria Longitudinal Study (VLS). Initial analyses included independent groups factorial analysis of variance models to pursue the 2 main research questions. Results: First, initial results indicate individuals with higher PP had significantly lower performance on the Color Trails test and Hayling Sentence Completion test than adults with lower pulse pressure. Adults with a low PA level performed more poorly on the Color Trails test and the Brixton Spatial Anticipation test than their more active peers. Second, in concordance with previous VLS findings, individuals with the IDE major G allele performed better on EF measures than individuals with the minor A allele. No significant effect of BDNF was indicated across any of the EF measures. Conclusion: In the present case, vascular health and physical activity independently influence executive functioning in older adults. Furthermore, as previously indicated, the IDE G+ genotype is associated with stronger performance on EF measures in older adults, however, BDNF was not associated with changes in EF performance.

P10 **Don't throw it: lob it! Bilingualism and near synonyms**

J. Paquet, H. Hoang, E. Nicoladis, & R. Furman (University of Alberta)*

While child bilinguals sometimes lag in vocabulary scores relative to monolinguals, adult bilinguals can score within the same range as monolinguals. It is possible to perform well on vocabulary tests as long as someone understands the approximate semantic category of a word. This study tests whether bilinguals might differ from monolinguals in their understanding of near synonyms. Near synonyms are defined as lexical pairs that have similar cognitive means but different physical representation (e.g., lob vs. throw). We predicted that bilinguals might make fewer distinctions between near-synonyms than monolinguals. In this study, bilingual (N=14) and monolingual (N=12) participants were compared in how they enacted 16 English verbs, related to throwing (N= 4), clenching (N=6) and stroking (N=6). Their enactments were coded for multiple dimensions, including hand shape, force, start of movement, etc. There were no differences between the two groups on English vocabulary scores. The monolinguals showed high agreement in how to act out the verbs, across the multiple dimensions. The bilinguals differed from the monolinguals, sometimes making fewer distinctions between near-synonyms than the monolinguals. The results suggest that environmental exposure may be required to form distinct lexical representations within a semantic category.

P11 **The effect of inducing time pressure on response inhibition in early childhood: An ERP study**

A. Abdul Rahman, S. A. Wiebe (University of Alberta), D. J. Carroll (University of Sheffield), & K. A. Espy (University of Oregon)*

Response inhibition predicts important behavioral outcomes in childhood and develops rapidly in early childhood. In this study, we examined the neural correlates of response inhibition when time pressure was induced in a go/no-go (GNG) task; previous work has shown that decreasing the response time window increases response prepotency and thereby inhibitory demands. To investigate how this manipulation affects young children, 5-year-old children (n = 34) completed a GNG task while we recorded scalp EEG; children were divided into two groups that differed in the response time window (Fast group = 750 msec; Slow group = 1500 msec). Dependent measures included accuracy, response times (RT), and event related potentials (ERP) measures (N2 and P3 amplitude and latency). Children in the Fast group responded more quickly, suggesting that the time pressure manipulation was effective. Research in older children and adults typically finds that N2 amplitude and latency differ between go and no-go trials. In contrast, present findings in early childhood revealed P3 amplitude and latency to be the distinguishing markers between go/no-go trials, where on no-go trials P3 amplitude was higher in both groups and latency was earlier in the Fast group. Our results are in line with suggestions that neural markers of inhibition have not yet fully migrated to frontal regions in early childhood, and suggest that when children must respond quickly under time pressure, they must engage inhibitory mechanisms more quickly in order to successfully suppress prepotent responses.

P12 **Social comparison and language learning mindsets: Implications for international students' cultural adjustment**

D. Lam, N. Quang*, M. Lou, & K. Noels (University of Alberta)*

In a multicultural nation such as Canada, citizens with their respective perspectives and beliefs interact with a diverse range of people with their own perspectives and beliefs as well. Previous research showed that students' language learning mindsets influenced students' language learning outcomes such as language learning goals and motivation (Lou & Kim, 2014). In this study we aimed to analyze international students' or newly immigrated citizens' language learning mindsets and the impact on their adjustment to Canada. Participants consisted of international or newly immigrated students (N=149) who were randomly assigned to three conditions: comparing their English ability to Canadians, to people from their home country, or the control condition. Participants completed a questionnaire about language learning mindsets, English fluency, sense of belonging, cultural interactions and adjustment in Canada. We found that students who compared themselves to people from their home country were more likely to believe that their English ability was incremental, and participants who had incremental language mindsets had less language anxiety, stronger sense of belonging, and felt more positive when interacting with Canadian citizens. On the contrary, participants who were instructed to compare themselves with English speaking Canadians were more likely to hold an entity perspective on language ability, with more anxiety, less belonging, and more likely to report negative and fewer interactions with native English speakers. This study indicated that students learning a different language in a different country could benefit from an incremental perspective and comparing their language ability to someone in their home country.

P13 Resting rhythms and anxiety disorders

P. K. Kang , M. Bottomley, J. B. Caplan (University of Alberta)*

Depression and anxiety are common mental health problems. A type of brain activity, oscillations, recorded using electroencephalography (EEG), shows healthy young subjects have differing oscillatory peaks in comparison to young subjects who have been clinically diagnosed with anxiety or depression. In an aging study, our healthy young subjects (ages 18-29) had resting brain waves recorded during an alternating eyes open and eyes closed task. Five out of the twenty-four young subjects recruited were clinically diagnosed with anxiety and depression, and removed from analyses regarding aging. However, here we follow up, comparing the brain activity of healthy young subjects to the subjects who had been clinically diagnosed with anxiety disorders. The signal was analyzed in order to quantify oscillations with a conventional oscillation quantifying method, wavelet analysis, and with the Better Oscillation (BOSC) detection, which is more selective for rhythmic activity. The results from both conditions (eyes open and eyes closed) and measurements show a reduction of alpha peak-frequency in the patient group. Furthermore, subjects with anxiety also show less rhythmic activity in the delta range (1-4 Hz) according to the BOSC measure in both eyes open and eyes closed conditions. Three clinical subjects were prescribed antidepressants and two subjects were not using any medications for their condition, suggesting medication may not explain these differences.

P14 Don't fear the reaper: Materialism, mortality salience and religiosity

A. Khaira & J. Schimel (University of Alberta)*

This paper explores the relationship between TMT, religiosity and materialism. Essentially it builds on existing work, particularly that of Kasser and Sheldon (2000), which found a direct correlation between MS and increased materialism. This research makes use of an additional measurement, that of Christian Religiosity, using both the Christian Conservatism Scale (CCS) (Stellway, 1973), and the Christian Orthodoxy Scale Attitude Survey (CO) (Fullerton; Hunsberger, 1982; 1989). By first separating participants based on this measure into two groups, one high in Christian religiosity, and the other who are low in religiosity, we then measure the effects of MS on materialism after inducing a scriptural prime that involves participants reading a series of verses from the Bible that undermine materialism. Essentially we predict that the effects of MS on materialism will be mitigated to some extent firstly for participants who are high on Christian religiosity, and to an even greater extent for this same sub-group when the scriptural prime is activated.

P15 Decreased alpha oscillations and memory-related event-related potentials together determine better memory outcomes

Y. Y. Chen & J. B. Caplan (University of Alberta)*

Oscillations and event-related potentials (ERPs) have been linked to memory outcome, when recorded during encoding and retrieval phases of recognition-memory tasks. Jacobs et al. (2006) and Klimesch et al. (2010) suggested alpha-band (8-12 Hz) desynchronization and theta-band (4-8 Hz) synchronization correspond to so-called "dual-processes," familiarity and recollection, which in turn have been proposed for retrieval-related ERPs, the FN400 and the Left Parietal Positivity, respectively. Here we tested this oscillation-ERP mapping by quantifying oscillations and ERPs linked to memory outcome. Rather than attempt to distinguish recollection and familiarity, we tested a pre-condition for the hypothesized mapping: that oscillation- and ERP-measures explain shared variance across participants. Sixty participants performed old/new recognition memory task. We quantified oscillations and ERPs at test by computing the difference between hits (correctly identified old item) and misses (incorrectly identified old item). As predicted, the alpha measure (at Oz) correlated with the FN400 measure (at Fz, previously linked to familiarity), $r(59)=0.33$, $p<0.05$. Both the alpha and FN400 measures correlated significantly with d' and negatively with response times across participants, supporting their relevance to memory outcome. In contrast, the theta-oscillation measure (at FCz), apart from differentiating hits from misses, did not explain variability in either ERP or behaviour across participants, questioning the hypothesis that theta oscillations support recollection-based recognition-memory. Our findings are consistent with alpha oscillations reflecting visual inattention, and with frontal-midline theta oscillations reflecting relational memory processes that are not essential for item-memory tests (Glaholt & Caplan, 2007; Nyhus & Curran, 2010).

P16 Gender differences in emotion-cognition interactions in early and middle childhood

S. Elke (University of Alberta), A. Kapasi (Western University), D. Shi, & S.A. Wiebe (University of Alberta)*

In early childhood, emotion regulation and inhibitory control are more closely related in girls than in boys. This finding has been attributed to sex differences in anterior cingulate and prefrontal cortex development, important areas for cognitive and emotional regulation. The present study investigated the moderating effect of gender on the relationship between emotion regulation and inhibitory control in early and middle childhood using event related potentials (ERPs). The frontocentral N2, reflecting response conflict, and the posteriocentral P3, reflecting attentional control and working memory demands, were examined in a frustration-inducing child-adapted Flanker task. A sample of 19 4-5 year olds (10 girls) and 24 7-8 year olds (11 girls) indicated the direction a central fish was swimming on a response pad. This target fish was flanked by fish swimming in the opposite direction (incongruent), the same direction (congruent) or by starfish (neutral). Emotion regulation was manipulated across three blocks: a Baseline block where the task was presented normally; a Frustration block where some trials included a 2- to 10-second temporal lag; and a Recovery block where the task returned to normal. In the Frustration block only, girls performed the task more slowly than boys, but with equivalent accuracy. There were also sex differences in both ERP measures in the Frustration block: girls had smaller N2 peaks and larger P3 peaks. This suggests that boys and girls differ in their response to frustration, such that girls slow to deal with their frustration, decreasing their conflict sensitivity and increasing their working memory load.

P17 Teacher-child relationship quality and internalizing problems in early elementary school: The role of classroom emotional support

T. Mejia & W. L. Hoglund (University of Alberta)*

Internalizing problems (e.g., symptoms of depression and anxiety) can begin to develop in children as young as four (Luby, 2003; Luby, 2010) and may be pervasive throughout childhood and adolescence (Egger & Angold, 2006). The quality of teacher-child relationships (e.g., close, conflictual, dependent) can relate to internalizing problems over time (Buyse et al., 2008; O'Connor et al., 2011). However, the direction of these associations is unclear. Internalizing problems may contribute to poorer relationship quality over time (Murray & Murray, 2004) or these processes may also transact over time (Zhang & Sun, 2001). The current study tests three directional models of these associations (teacher-driven model, child-driven model, and transactional model) to assess which best captures associations between internalizing problems and teacher-child relationship quality. As associations between these processes may be affected by the classroom context, we further assess whether classroom emotional support moderates the directional associations between internalizing and relationship quality (Buyse et al., 2008). Children in Kindergarten to grade 3 (N = 461) in ethnically diverse, high needs schools participated in this study. On three occasions over a 6-month school term children reported on their internalizing problems (Reynolds & Kamphaus, 2004) and teachers reported on the relationship quality (Pianta, 1992). Cross-lagged path analysis indicated that associations between internalizing problems and teacher-child closeness were best described by the child-driven model. The next steps will be to assess which model best describes associations between internalizing problems and teacher-child dependency and conflict. Multiple-group models will test classroom emotional support as a moderator.

P18 ZENK expression in response to conspecific D notes in hand-reared black-capped chickadees

D. Lee, A. H. Hahn, J. Hoang, N. McMillan, L. M. Guillette, & C. B. Sturdy (University of Alberta)*

Songbirds are one of only a few animal groups that require experience with adult conspecific vocalizations to learn to produce species-typical vocalizations. The black-capped chickadee (*Poecile atricapillus*) is a species of songbird that produces a complex chick-a-dee call. This call is a learned vocalization comprised of four note types (A, B, C, D). Previous research suggests that the D-note portion of the call is robust to degradation and encodes species-specific information. In the current study, we examined immediate early gene (ZENK) expression in two songbird auditory brain regions: the caudomedial mesopallium (CMM) and the caudomedial nidopallium (NCM). Prior findings have established that these auditory areas show increased ZENK expression following presentation of conspecific vocalizations. Here, we examined how different developmental experience would affect the neural response to conspecific D notes. We hand-reared birds under three conditions: black-capped chickadees reared with black-capped chickadees, black-capped chickadees reared with mountain chickadees and black-capped chickadees reared in isolation from adult conspecifics. During playback, we presented conspecific D notes to these hand-reared birds and to a group of wild-caught adult black-capped chickadees. We quantified ZENK expression in CMM and NCM and will discuss the relationship between the amount of expression and developmental experience (i.e., experience with conspecifics (both hand-reared birds and wild-caught adult birds), experience with a heterospecific chickadee species, and no experience with adults).

P19 An examination of ethnic groups' perceptions of being stereotyped in Canadian society

N. Corbett, S. A. Chanminaraj*, H. Kil, & K. A. Noels (University of Alberta)*

The Stereotype Content Model (SCM; Fiske et al., 2002) hypothesizes that social groups are stereotyped along trait dimensions of competence and warmth, which are predicted by status and competition, respectively. This study examined whether the SCM can be applied to the kinds of stereotypes that different ethnic groups perceive in Canadian society. A total of 1184 participants from various ethnic groups answered items from the SCM, reworded to investigate stereotype perceptions along SCM traits and predictors. All participants completed the questionnaire online during a mass testing session. Responses were categorized by the participants' ethnic identification, resulting in 8 ethnic groups: Caucasian, East Asian, South Asian, Southeast Asian, Middle Eastern, African, Hispanic, and Aboriginal. Correlation analyses found that the two predictors were positively correlated and the two traits were also positively correlated. A significant relationship existed between competence and status, warmth and status, as well as competition and competence. However, warmth and competition were not related. Cluster analyses conducted with trait and predictor means suggested that stereotype perceptions differed by ethnic group. Specifically, Caucasians perceived that they were seen as highly competent and warm, while Aboriginal and Metis groups perceived that they were stereotyped as low in both competence and warmth. All other ethnic groups considered themselves as being stereotyped moderately, falling between the high-high and low-low clusters. The results of the present study may be useful in better understanding ethnic relationships by bringing awareness to stereotype perceptions, thereby strengthening inter-ethnic interactions in both formal and informal encounters.

P20 Developing a pigeon model of human gambling

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In an operant conditioning setup, pigeon behaviour seems to contain many parallels to the experienced-based learning that occurs in certain types of human gambling. Pigeons, like humans, are naturally sensitive to the contingencies governing reinforcer delivery and show many of the same decision biases as humans when analogous types of choice tasks are administered. This has led some researchers to suggest that a pigeon model of human gambling behaviour may be appropriate. In order to test the feasibility of this claim, we constructed a comparative experiment testing our recent findings with humans demonstrating that it is the extreme outcomes within a decision context that exert the largest control on choice behaviour. Consistent with this previous work, both humans and pigeons demonstrated significantly greater risk-seeking for higher value choices than lower value choices, even when equivalent amounts of trials between the two species were used, thereby lending support for a pigeon model of human gambling behaviour.

P21 Functional role of amygdala: A high-resolution functional magnetic resonance study of emotional processing

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The neuroanatomical substrate of emotional processing has been studied using functional magnetic resonance imaging (fMRI) for a number of years. While much of this research has focused on the amygdala, most studies have not had the spatial resolution required to isolate the amygdala proper from the surrounding structures in the medial temporal lobe. In addition, partial volume effects from the adjacent vasculature and white matter have also prevented accurate localization of the BOLD response within the amygdala itself. In the present study we developed a high-resolution fMRI scanning and analysis protocol aimed at elucidating the functional significance of the amygdala in emotional processing. Healthy volunteers rated images of varying levels of emotional arousal (high, medium, low, and neutral) in an event-related fMRI task. T2*-weighted axial EPI volumes were acquired on a Varian Inova 4.7T scanner (30 axial slices, TE = 19ms, TR = 2000ms, 74 volumes, resolution = 1.5x1.5x1.5mm³). An ultra-high resolution structural T2-weighted 2D Fast Spin Echo (FSE) scan (90 coronal slices, TE = 39ms, TR = 11000ms, resolution = 0.52 x 0.68 x 1.0mm³) was also acquired for high-precision manual anatomical tracing of the amygdala using a reliable volumetric protocol developed by our group. Results showed that BOLD signal change co-varied with the emotional arousal level of the image in the left amygdala, with some individual variability based on the subjective ratings of emotional arousal. Subdivision of each amygdala into centromedial (CeM), basolateral (Bla), and lateral (La) sections revealed that the left CeM subregion experiences the greatest modulation of BOLD response based on the emotional demands of a task.

P22 A verification of octave equivalence in humans

*J. Hoang**, *D. Cervantes (University of Alberta)*, *M. Hoeschele (University of Vienna)*, *R.G. Weisman (Queen's University)*, & *C.B. Sturdy (University of Alberta)*

Octave equivalence is the perception of notes differing in frequency by one or more doublings (i.e., octaves) as similar. Accurate absolute pitch judgments rely on the use of both pitch chroma and pitch height, but the two are sometimes conflicting mechanisms of pitch perception. For example, despite a larger difference in pitch height, when two notes are separated by an octave they may sound more similar than notes separated by one-third of an octave due to pitch chroma. Our previous research demonstrated octave generalization in humans using a go/no-go discrimination task that divided the twelve note chromatic scale into three four-note ranges. This previous study didn't differentiate between pattern generalization, which would rely on pitch height, and octave generalization strategies, which would rely on pitch chroma. The current experiment tested the two generalization strategies by dividing the twelve note scale into six pairs of sequential ranges. Participants were trained with the first three pairs of the fourth octave (C4/C4#, D4/D#4, E4/F4), and tested with either the last three pairs of the fourth octave (Intra-octave group: F#4/G4, G#4/A4, A#4/B) or the first three pairs of the fifth octave (Inter-octave group: C5/C5#, D5/D#5, E5/F5). We rewarded 'go' responses to D4/D#4 notes during training, and then tested for generalization and transfer. Without any pitch chroma cues, the Intra-octave group did not show generalization or transfer, while the Inter-Octave group which had pitch chroma cues show generalization and transfer. Our data strengthens our previous work showing that humans use octave equivalence to solve these discrimination tasks.

P23 The effect of reward value on implicit memory

*I. Ober**, *C. R. Madan*, *E. Fujiwara*, *S. E. Gilliam*, & *J.B. Caplan (University of Alberta)*

Animals, including humans, can prioritize their behaviour to maximize reward. Do people have a bias to items associated with higher values, even when there is no current advantage in doing so? We thought such a bias might be useful in realistic learning situations. One would think this question has already been tested; however, previous studies investigating the effect of reward value on memory have used procedures for which there is a rational advantage to learning about high-value items more than low-value items. To avoid this confound, in our procedures, learning only about high-value items could earn the same amount of reward as learning about only low-value items. Participants had to bet on, or against, a single word at a time (36 words total), where each word was associated with a probabilistic reward (high-value words: 80% high reward, 20% low reward; vice-versa for low-value words). In a subsequent, unrewarded lexical decision task, we found enhanced memory accessibility (faster lexical decision response times) for the high-value than low-value words. In a second experiment, we asked whether the bias would generalize to deterministic reward outcomes and a larger stimulus set— 48 words. The lexical-decision bias was replicated. This may be the first effect of value on behaviour, a fundamental bias that may 'snowball' into larger and more complex biases in learning, favouring high-value over low-value items, as those items are re-used in future learning experiences.

P24 Features indicating sex of the caller in the chick-a-dee call of black-capped chickadees (Poecile atricapillus)

*K. A. Campbell**, *A. H. Hahn*, & *C. B. Sturdy (University of Alberta)*

Black-capped chickadees (*Poecile atricapillus*) are North American songbirds with a wide geographical distribution. Black-capped chickadees produce a variety of learned vocalizations, including their namesake chick-a-dee call. Work from our group and other labs have found that this complex call contains information regarding species and individual identity. In addition, using immediate early gene assays, we showed that black-capped chickadees have different levels of gene expression in response to male and female chick-a-dee calls. The ability to perceive an individual's sex from their call alone is an ecologically relevant skill for chickadees as it could be used to identify a potential mate and allows for identification without visual contact. Although it seems that there may be perceptible differences between male and female calls, we are unsure which features these are. Recently, we demonstrated that there are acoustic features within the black-capped chickadee fee-bee song that indicates the producer's sex, but sex-specific features in chick-a-dee calls have not been identified, although previous studies have demonstrated that there are perceptible differences between male and female calls. In this study I measured acoustic features of male and female black-capped chick-a-dee calls and used permuted discriminant function analyses to compare the calls based on sex. The results of this study will lead to a more complete understanding of the features within the chick-a-dee call. Future research will involve operant discrimination of male and female calls with manipulation of features that identify sex.

P25 Evaluating the impact of academic mentorship on high school student researchers

J. W. Canning & E. L. Kartes* (University of Alberta)*

There have been many initiatives designed to showcase post-secondary education as a promising option for continued education after high school to current high school students. The aim of the current pilot study is to provide high school students with the opportunity to gain experience with academic research in a professional setting by participating in the study as student researchers as well as explore the opportunities available to them in university. High school students from the Sturgeon School Division were invited to participate in a research project on high school completion within their school division by helping to generate surveys, conducting focus groups, and finally providing recommendations to the Board of Trustees. After completing the preliminary project on high school completion, students shared their experiences in the project. Students who participated in the project indicated that they enjoyed and valued their experience. In this poster, we will provide further data and analysis from the students' feedback. We will also develop recommendations based on the students' feedback that will be used to improve the project for future participatory research involving high school students as researchers.

P26 The peg list method can support memory for associations

S. S. Sahadevan, Y. Y. Chen, & J. B. Caplan (University of Alberta)*

Much evidence favours positional coding models of serial-recall, memory for an ordered list. Such models link list items to a representation of position. A popular strategy, the peg list method, resembles positional-coding— a pre-memorized list of ten highly imageable words, “pegs,” which rhyme with numbers (e.g., one-bun, two-shoe) is used to learn new lists by forming an image of a list item with the corresponding peg word. We use a strategy, the peg list method, to test a hypothesis derived from modeling work. Caplan (2005) showed that a positional-coding model could be used to learn a set of pairs (associations). Therefore, we tested whether the peg list strategy, developed for serial lists, could also be used with sets of word-pairs. We instructed three groups of participants (N=309): the one peg/pair group linked both words in a pair to one peg, the two peg/pair group linked each word to a different peg, and the serial-list group was told that the words formed a serial list, and linked each word to a different peg. All three groups successfully learned sets of word-pairs, even when screening for high-compliance, with the one peg/pair group outperforming the other groups. Interestingly, many participants reported forming item-item images, despite being instructed not to. In sum, the peg list method, with little training, can support memory for associations, as predicted by modeling work, but this positional-coding-like strategy may be mixed with inter-item associations, deviating from hard-line distinctions in mathematical modeling.

P27 Future-oriented processing and children's understanding of self-regulation strategies

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The ability to delay gratification is a marker of the early emergence of self-regulation (Mischel, Shoda & Peake, 1988). Most existing research has explored children's efficacy in implementing delay strategies suggested to them by researchers, but there is little research exploring children's independent, spontaneous utilization and understanding of such strategies. The present study fills this gap in our current understanding. Participants were children between 4 and 6 years old. After completing a 2-minute delay of gratification task to familiarize the concept of waiting for a reward, participants completed a choice task, in which they selected items that they believed would help them delay gratification and explained their reasoning to the experimenter. Arrays of possible choices included target items that children could use to deal with the demands of waiting for a reward (e.g., an interactive toy to deal with boredom). Preliminary analyses on a subsample of children (n = 20) revealed significant age differences in performance on the choice task. More specifically, six-year olds performed significantly better than 4-year olds, but there appear to be no significant differences in performance between 4- and 5-year olds. These findings therefore suggest a developmental shift in children's ability to consider their future needs when faced with immediate temptation.

P28 Examining correlations between general sense of belonging, school sense of belonging, and Facebook use

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This study determined if general sense of belonging is associated with a school sense of belonging and if Facebook use (social or non-social) influences perceptions of general and school belonging. The 87 participants were University students recruited by convenient sampling in first-year undergraduate psychology classes and completed a questionnaire reporting on: general need to belong, perceived sense of school membership, personality, and Facebook use. Hagerty et al. (1992) define a general sense of belonging as the experience of personal involvement in a system or environment; feeling connected to one's campus would be related to a general sense of belonging. Thus, we hypothesized that general and school belongingness would correlate significantly. As the modern world evolves, more human interactions occur online on social networking sites (SNSs) like Facebook (Park et al., 2012). Socializing on Facebook may increase the likelihood of feeling valued, needed, important, and congruent with others, which Hagerty et al. (1992) state as the fundamental characteristics of sense of belonging. We predicted social Facebook use would be correlated with both a general and school sense of belongingness. There were no significant correlations between: general and school sense of belonging; social belongingness and extraversion; social and non-social Facebook users with general sense of belonging. Social Facebook users reported a significantly higher sense of school belonging compared to non-social Facebook users. Participants may have utilized Facebook mostly to interact with new campus friends and not to maintain old friendships. New friendships associated with the University may have been conceptualized as increased school belonging, consequently leading to social Facebook users to feel school belongingness.

P29 Civic engagement, work rewards, and being generative in midlife

J. Chen, N. L. Galambos, H. J. Krahn, & M. D. Johnson (University of Alberta)*

Generativity, the seventh stage of Erik Erikson's theory of psychosocial development, focuses on how individuals in midlife take stock of whether they have contributed to the continuity and betterment of society by nurturing and guiding the next generation through productive and creative endeavors. In this study we investigate the effect of parenting satisfaction, civic engagement, and work rewards on generativity in midlife. First, we hypothesize that raising one's offspring and contributing to his/her well-being offer a chance to fulfill a person's generative needs. Our second hypothesis is that civic engagement, voluntary activity in organizations for the improvement of the community and society, is positively associated with generativity. Our third set of hypotheses predict that social work rewards, having the chance to help other people at work, and intrinsic work rewards, opportunity for individual creativity at work, are positively associated with generativity, while extrinsic work rewards, good pay and job security, are unrelated to generativity. Data were drawn from the 2010 wave of the 25-year longitudinal Edmonton Transitions Study (N = 405). This panel study first interviewed high school seniors in 1985; six follow-up interviews were conducted in 1986, 1987, 1989, 1992, 1999, and 2010. Results from our preliminary analysis suggest that more civic engagement and higher (self-reported) social and intrinsic work rewards predict higher levels of generativity. Surprisingly, greater parenting satisfaction was not related to feeling generative. Further analyses will be performed through structural equation modeling using Mplus. Implications of the findings will be discussed.

P30 Ukrainian heritage language maintenance in Ukrainian-Canadians

I. Dymouriak-Tymashov, N. Hawryluk, & K. Noels (University of Alberta)*

The number of persons identifying with a Ukrainian heritage in Canada is one of the largest after the number of those in Ukraine itself and Russia. However, it is rare to hear Ukrainian spoken in Canada and rarer still to find those who speak it fluently, particularly among younger populations. This study examines the role of Ukrainian identity and immersion in Ukrainian communities on the maintenance of Ukrainian language in Canada. Focus groups were used to gain a better understanding of the correlation of ethnic identity and Ukrainian fluency in Canadian Ukrainians, if any does exist.

P31 **Rapid makes risky: More risky choices for speeded decisions**

C. R. Madan (University of Alberta), E. A. Ludvig (University of Warwick), & M. L. Spetch (University of Alberta)*

Time pressure is a common constraint on many real-world decisions, such as those made by traders placing orders in the stock market, bidders in an auction, or gamblers at a casino. Many of these situations also involve elements of risk or uncertainty. Previous research on the impact of time pressure on risky decisions has yielded mixed results: some studies found that people become more conservative and gamble less under time pressure, whereas other studies found more risky choices. These previous studies, however, have focused on decisions made from probabilities that were explicitly described, rather than learned through experience. Here we tested how time pressure influences risky decisions from experience, while manipulating the expected value of the outcome. Participants who had greater time pressure chose risky options more often, independent of outcome magnitude. These results suggest that people may be particularly susceptible to gamble when under time pressure and operating with partial information gleaned from experience.

P32 **Further support for the efficacy of intrinsic religiosity in buffering against existential anxiety**

M. Sharp, J. Schimel (University of Alberta), D. Webber (University of Maryland; University of Alberta), & J. Blatter (University of Alberta)*

Terror management theory (TMT) posits that worldviews and self-esteem buffer against the existential anxiety inherent within the human awareness of mortality. An especially effective worldview is that of religion, but work in the psychology of religion has shown that there are different ways one can relate to their religion. Research investigating religion's role in terror management processes has found that higher levels of intrinsic religiosity, using religion as a guiding force, can act as an effective buffer against existential anxiety when confronted with a worldview threat, as measured by death thought accessibility (DTA) and worldview defense. Conversely, extrinsic religiosity, using religion for social or personal needs, and lower levels of intrinsic religiosity has been shown to be ineffective in buffering against existential anxiety. Interestingly, previous research has neglected using worldview threats related to different religious elements, such as belief and community. Thus, to fill this gap, the current study had intrinsically or extrinsically religious participants read an article that was aimed to threaten either intrinsic (belief) or extrinsic (community) elements of religion or a control article. After reading the article, participants completed a word fragment task to measure DTA. It was hypothesized that participants who read articles threatening to their particular religious orientation would show higher levels of DTA than participants who read the other articles. A main effect of religious orientation was found, with extrinsically religious participants exhibiting higher levels of DTA than intrinsically religious participants. Results support the efficacy of intrinsic religiosity in buffering against death-related existential anxiety.

P33 **Studying morphological processing of English compounds using typing time**

K. Robertson, S. Gore*, K. Nisbet, C. L. Gagné, & T. L. Spalding (University of Alberta)*

Many studies have explored the comprehension of compound words (e.g., strawberry). However, there has been very little focus on the production of compounds. In our study, we used a typing task to examine the extent to which morphological structure and semantic transparency affect the written production of compound words. Although compounds have morphological structure (i.e. they are composed of two constituents such as [snow] + [ball]), it is undetermined whether the production of compounds is influenced by the semantic transparency of the constituents. We used compounds that varied in semantic transparency; some were transparent (e.g., blueberry) and others were opaque (e.g., hogwash). To manipulate the accessibility of the first constituent, we presented a prime word that was semantically related or unrelated to the first constituent of each compound. To analyze the written production of compound words, we measured the inter-letter typing speed of the compound, as well as the first letter of the second constituent and the letters adjacent to it. Typing time increased between the first and second constituents across all compound types. In addition, a priming effect was found only for compounds with transparent second constituents. These results suggest that the semantic transparency of the second constituent influences the priming effect. The results also show that the morphemic structure of compound words is involved at the level of production.

P34 **Chickadee vocal response to threat-level varies with signaler**

J. V. Congdon, A. H. Hahn, N. McMillan, M. T. Avey, & C. B. Sturdy (University of Alberta)*

Chickadees produce several vocalizations critical to their survival. One of these vocalizations is the chick-a-dee call, which chickadees use as a mobbing call in the presence of predators to recruit and coordinate conspecifics and heterospecifics. Chick-a-dee calls are comprised of four notes types (A, B, C, D). Previous research has shown that these mobbing calls contain more 'D' notes when exposed to a high-threat predator than a low-threat predator. Here we examined chickadee vocal responses to playback of predator calls and mobbing calls to determine: (1) if chickadees produced similar vocalizations to matched predator and mobbing calls (e.g., a low threat predator call and a low threat mobbing call); (2) which threat level elicits the most vocalizations; and (3) whether chickadees produce more D notes in response to a high threat versus a low threat vocalization, for both predator calls and the corresponding mobbing calls. We analyzed audio recordings, originally collected as a part of Avey et al.'s (2011) study, in which wild-caught black-capped (*Poecile atricapillus*), wild-caught mountain (*P. gambeli*), and isolate-reared black-capped chickadees were played predator calls, mobbing calls, or non-threat calls. Preliminary results indicate that black-capped and mountain chickadees vocalize less to high threat predator calls than to the corresponding mobbing calls and that black-capped chickadees vocalize more in the first 10 minutes of playback than baseline to chickadee-produced mobbing calls regardless of threat level. Our results indicate that chickadees respond similarly to mobbing calls produced by conspecifics or heterospecifics (in the case of mountain chickadees), and both species vocalize less in response to predator vocalizations.

P35 **Effects of chunking on memory judgements of relative order**

Y. S. Liu & J. B. Caplan (University of Alberta)*

In serial recall, participants are asked to remember a list of items in its original order. A chunking strategy, where items in a list are grouped into chunks, is known to help serial recall performance. When lists are temporally organized into groups of three items, "chunks," serial recall is improved. The dominant explanation of this facilitation is that chunking causes participants to store item positions more accurately, with one code for item position and another for the position of each item within its chunk. If this were true, then one would predict that chunking should facilitate judgements of relative order. In judgements of relative order, participants are asked to judge the order of a pair of probe items from the list they just studied. We presented participants lists of 9 consonants. For half the participants, the lists were grouped in 3s, with longer inter-stimulus intervals between chunks than within chunks, and for the other half, items were presented at an even presentation rate. We found chunking facilitated both serial recall (Experiment 1) and judgement of relative order (Experiment 2) accuracy. This suggests the judgments of relative order and serial recall test may share the same underlying representation of order.

P36 **Vocal response of black-capped and mountain chickadees to conspecific and heterospecific calls**

R.M. Robertson, A.H. Hahn, & C.B. Sturdy (University of Alberta)*

Black-capped chickadees (*Poecile atricapillus*) and mountain chickadees (*P. gamebeli*) are closely-related songbird species that produce namesake chick-a-dee calls. The introductory chick-a portion of the call is comprised of higher frequency A, A/B, B, or C notes, while the terminal dee portion of the call is made up of lower frequency D or D-hybrid notes. Perceptual tests have demonstrated that the dee portion of the chick-a-dee call contains more species-typical information in comparison to the introductory chick-a portion; however, birds can identify the species of the vocal producer using any of these note-types. We will present behavioural data that is part of a larger neurobiological study examining the neural response in auditory areas in chickadees presented with playback of the chick-a portion of calls produced by four songbird species of varying phylogenetic relatedness. Black-capped and mountain chickadees heard playback of vocalizations produced by either: (1) black-capped chickadees, (2) mountain chickadees, (3) boreal chickadees, (4) gray-crowned rosy-finches, or (5) black-capped chickadee calls played in reverse. Our aim was to examine whether phylogenetic relatedness influenced the vocalizations produced by the chickadees during playback. Preliminary data reveals that chickadees produced the most vocalizations in response to calls produced by conspecifics or closely-related heterospecifics (black-capped or mountain chickadees). Future work will assess the neural responses in chickadees to determine whether there is differential gene expression following these playback conditions. This will provide us with a more comprehensive understanding of the importance of phylogeny versus acoustic structure when birds hear and perceive conspecific and heterospecific vocalizations.

P37 **Lifetime orientation and social motives in dementia**

L. Bohn, S. T. Kwong See (University of Alberta), H. H. Fung (Chinese University of Hong Kong), P. Goel, & J. Nathoo (University of Alberta)*

Our research examined social motivation in dementia within the theoretical framework of socioemotional selectivity theory (SST). SST is a lifespan theory of social motivation that argues goal selection and pursuit are related to subjective time horizons. Knowledge-related goals and novel social partners are prioritized when the future is perceived as expansive. Emotion-regulation goals and familiar social contacts are prioritized when the future is perceived as constrained. Although it is widely understood that dementia is associated with disorientation to age and time (e.g., clock and calendar), little is known about the impact of dementia on orientation to lifetime. This research examined how dementia affects subjective time horizons, and the implications this holds for (1) the relative prioritization of social goals and (2) social contact preferences. Participants were 23 individuals in the moderate stages of disease progression. Twenty-five young adults, 25 young-old adults, and 25 old-old adults served as the comparison populations. Time perspective was assessed by the Future Time Perspective scale and by showing participants a line and asking them to place a mark on the line that represents their temporal position in life. Social goals were examined by asking participants to tell the researcher up to four goals they have when they think about the future. Partner preference was inferred by asking participants to indicate whether they would like to spend 30 minutes of free time with a member of their immediate family, a recent acquaintance, or a famous person they admire. Theoretical and practical relevance of our findings are discussed.

P38 **Self-determined classroom engagement in Turkish adult learners of English**

A. Dincer (Erzincan University) & K. A. Noels (University of Alberta)*

Engagement is a buzzword in higher education and it has been widely researched in relation to motivation, achievement, drop-out in different educational domains. Self-Determination Theory (SDT) assumes the universality of basic psychological needs and proposes the influence of social context over many academic dynamics, including engagement. The English as a foreign language (EFL) context includes many barriers hindering students' effective learning of English, and it is not unusual to find reticent learners who do not engage in classroom activities. Considering the above issues, this study hypothesizes that EFL students' classroom engagement including behavioral, emotional, cognitive and agentic, is correlated their perceptions of their instructors, and this relation is mediated by students' perceptions of their own autonomy, competence and relatedness. EFL students responded to a questionnaire regarding their EFL course instructor' motivating style, students' psychological needs satisfaction and English course engagement. The study findings indicated that there are significant correlations among aforementioned educational constructs, and autonomy, competence and relatedness feelings mediated the relationship between perceptions of teaching style and students' engagement. These findings are important for understanding adult EFL learners' motivation in classroom settings and the increasing their course-specific engagement.

P39 **Zip it: Zeta inhibitory peptide effective shuts up the hippocampus**

T. McKinney, M. LeBlancq, & C. Dickson (University of Alberta)*

PKMzeta has been implicated as "the memory molecule", but recent concerns regarding its absolute necessity for learning and memory process have been raised. To better address the methods used to assess PKMzeta function we infused zeta inhibitory peptide (ZIP) into the hippocampus and recorded spontaneous brain activity at the local infusion site. We found that ZIP suppresses neural activity, not unlike the local anesthetic lidocaine. These findings suggest that the typical methods used for evaluating PKMzeta functions in learning and memory are non-specific.

Campus Map

