# 27th Annual
# Joseph R. Royce
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Department of Psychology
University of Alberta

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Keynote Address by

Veronique Bohbot, Douglas Hospital Research Centre & McGill University

Invited Presentations by

Elena Nicoladis, University of Alberta

Weimin Mou, University of Alberta

Developmental Science Symposium

Multi-Method Perspectives on Developmental Science Across the Lifespan (Chair: Wendy Hoglund, University of Alberta)

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* Presenting Author

**Conference Organizing Committee**

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Jeremy Caplan (co-chair)
Freya (Shichen) Fang
Rui Zhang
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**Acknowledgment**

The Royce Conference Organizing Committee thanks the Faculty of Arts, the Faculty of Science, and the office of the Vice President, Research, for their generous support.

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# Invited Presentation (Telus 217/219)

9:00 **When forks and cows are boys: Culture and language effects on gender classification of objects**

*Elena Nicoladis (University of Alberta)*

Adults and school-aged children sometimes show small effects of language structure on their thinking. For example, when asked to choose a voice for a cartoon spoon, French-speaking adults often choose a female voice, corresponding to the grammatical gender of the French word. Researchers have generally failed to control for possible cultural biases in gender ascription. In the present set of studies, we compare French-English bilingual children's gender classification of objects with those of English monolingual children. The grammatical gender of the object labels in French did show a small effect on children's classifications around 8-10 years of age. However, from preschool age on, English monolinguals' classifications remained highly inter-consistent and stable. These biases are likely to reflect cultural ideas about the objects themselves. I discuss how these ideas might be conveyed to young children.

# Session 1 (Telus 217/219)

9:35 **Understanding the anchoring effect: Manipulating source credibility, context information, and the nature of the comparison question**

*C. Tam, O. Schweickart, & N. Brown (University of Alberta)*

Anchoring is a judgmental bias in which people's numerical estimates assimilate to initially presented values (Tversky & Kahneman, 1974). In the standard anchoring task, participants determine whether a target value is greater than or less than an arbitrary value (the anchor), and then provide their own estimate for the target. In two experiments, we investigate the mechanisms underlying the anchoring effect by manipulating source credibility, context information, and the nature of the comparison question. In Experiment 1, we manipulated the stated source of the anchor (i.e. "randomly generated" vs. "an estimate from another student") and the context (i.e., filler items with anchor values that were close to the correct value or were randomly generated). In Experiment 2, we manipulated the comparison question (greater/less vs. good/bad) and the design (posttest-only vs. pretest-posttest). Results indicate (a) that the size of the anchoring effect increases with source credibility and relevant context information, and (b) that the type of the comparative anchoring question fundamentally affects post-comparison estimates, with a strong tendency for consistent responding. Taken together, these results suggest that people are not uniformly influenced by anchor values, a finding that speaks against existing unitary accounts of anchoring.

9:50 **Predicting physiological and subjective engagement in a narrative task**

*L. Smithson & E. Nicoladis (University of Alberta)*

Human affinity for the production and comprehension of narratives emerges at a very young age (Alexander, Miller, & Hengst, 2001). Narrative production is thought to be strongly reliant upon three specific aspects of cognition: episodic memory, working memory, and attention (Wright, Capilouto, Srinivasan, & Fergadiotis, 2011). Though research suggests that working memory plays an important role in narrative production the specific contributions of visuospatial and verbal working memory remain unclear (Coelho, Le, Mozeiko, Krueger, & Grafman, 2012). One factor that may influence working memory is task engagement (Baddeley, 2003; Coelho et al., 2012). The purpose of the present study was to investigate whether individual differences in visuospatial and verbal working memory predict physiological and subjective measures of engagement in a narrative task. Twenty English monolingual undergraduate students (M = 18.65 years, SD = 1.57) were included in this study. Participants completed the Automated Working Memory Assessment (a standardized working memory assessment) (Alloway, 2007), watched two Pink Panther cartoons, and subsequently relayed a narrative for each cartoon to an experimenter. Physiological engagement (galvanic skin response) was measured throughout only one of their narratives. Afterwards, participants rated their subjective engagement on a Likert scale ranging from 1-5. Correlational analyses revealed that visuospatial working memory is strongly associated with physiological engagement and that story length and gesture production are strongly associated with subjective engagement. A Narrative Engagement Model is proposed and the implications of considering both cognitive resources and the externalization of cognitive resources as predictors of narrative engagement will be discussed.

10:05 **Does recent social experience influence behavioural lateralization in convict cichlids?**

*C. M. Sedlak Seaver, M. Moscicki, & P. Hurd (University of Alberta)*

Cerebral lateralization, the partitioning of cognitive function into specific hemispheres of the brain, is pervasive among vertebrates. Eye use preference for viewing stimuli is a commonly used assay for cerebral lateralization in fish, such as convict cichlids (Amatitlania nigrofasciata). Differences in sociality have been posited to underlie interspecific differences in lateralization. Species that school tend to view the same stimuli with the same eye, while non-schooling species tend to view the same stimuli with different eyes. Here, we investigate whether a similar effect exists intraspecifically, by assessing experimentally whether recent social experience influences eye preference within convict cichlids.

# Developmental Science Symposium (Telus 217/219)

10:40 **Multi-Method Perspectives on Developmental Science Across the Lifespan**

*Chair: Wendy Hoglund*

10:45 **A longitudinal case study of the acquisition of symbolic gestures as object labels**

*E. Nicoladis, J. St. Jean (University of Alberta), & P. Marentette (University of Alberta, Augustana Campus)*

Previous literature has shown that 18-month olds can equally well understand arbitrary and iconic gestures as labels for objects (e.g., Namy & Waxman, 2004). The prediction for the present longitudinal case study was that arbitrary and iconic baby signs would initially be comprehended equally well. As she got older, she might become more sensitive to iconicity (e.g., Sheehan, Namy, & Mills, 2007). A single child was taught 8 baby signs as labels for objects from the age of 9 months to 2;10 through exposure to two baby signs per week, 5 minutes per day over the two-year period. At the end of every week, the child's comprehension of the two baby signs was tested. The results showed that the child learned her first symbolic gestures (i.e., scored above chance on the comprehension task) at 2;6. After that point, there was no difference between iconic and arbitrary gestures. At 2;6, we tested how she extended iconic baby signs to novel objects; she extended the signs equally often to objects that performed the same action as the original as to objects that were the same kind. These results are consistent with cross-sectional studies we have done with other children. We argue that children learning spoken language(s) do not distinguish between a kind and action interpretation for gestures. The child's long-term failure to comprehend symbolic gestures as labels for objects was due to her lack of distinction between kind and action.

11:00 **Neural correlates of response conflict and emotional regulation in middle childhood**

*S. Elke, D. Shi, A. Kapasi, M. Khoei, Q. Beka & S. A. Wiebe (University of Alberta)*

Past research suggests emotion regulation and executive function are mediated by overlapping brain networks including prefrontal and anterior cingulate cortices. Childhood is marked by rapid development of emotional, attentional, and behavioural control, but the precise relationship between these distinct, interacting systems remains unclear. The current study investigated the relationship between emotion regulation and executive function in middle childhood using event related potentials (ERPs). The frontocentral N2, a negative deflection reflecting response conflict, and posterior-central P3, a positive deflection reflecting stimulus categorization, were examined in a modified Flanker task. Seven- and 8-year-olds were asked to "follow the middle fish" by pressing the left or right button. The target fish was flanked by fish swimming in the opposite direction (conflict), the same direction (congruent) or by starfish (neutral). Emotional regulation was manipulated across three blocks: a Baseline block where the task was presented normally; a

Frustration block where some trials included a temporal lag; and a Recovery block where the task returned to normal. There was a significant flanker effect on response times: conflicting stimuli were associated with longer RTs than congruent or neutral trials. The Recovery block was associated with significantly larger N2 amplitudes than the other two blocks. P3 amplitudes were largest in conflict trials, and P3 peaks appeared at shorter latencies in congruent trials relative to neutral trials. These results suggest that in middle childhood, recovery from frustration affects the N2 whereas the regulation of attention affects P3 amplitude and latency to a greater degree.

11:15 **The classroom context of children's peer relationship problems**

*W. Hoglund, N. Hosan, & S. Richards (University of Alberta)*

The classroom context represents an influential setting for the socialization of children. While research on how the quality of children's classroom affects their experiences of peer relationship problems is not well established, classrooms described as supportive, respectful and orderly may enhance children's relationships with peers (Gazelle, 2007). Alternatively, classrooms that exude an aura of hostility and chaos and that are populated by high aggregate levels of aggressive, disruptive children may increase children's risks for experiencing problems in their relationships with peers (Thomas et al., 2011). The current study asks whether classroom quality and aggregate levels of externalizing problems in the classroom affect changes in children's experiences of peer victimization, aggression and exclusion across one school term. Participants included 461 low-income, ethnically diverse children in Kindergarten to grade 3 in 63 classrooms in 10 elementary schools. Data were collected on three occasions during one school term. Peer victimization, aggression and exclusion were assessed from peer nominations. Classroom quality was assessed from structured observations. Classroom externalizing was assessed from teacher reports. Analyses indicated that children in higher quality and less aggressive, disruptive classrooms showed faster decreases in peer victimization relative to children in lower quality and more aggressive, disruptive classrooms. Children in less aggressive, disruptive classrooms also showed faster decreases in peer aggression and exclusion. Our findings draw attention to the protective role of supportive, organized classrooms and negative effects of aggressive, disruptive classrooms on children's risks for peer problems.

11:30 **The ebb and flow of personal control from the late teens to middle adulthood**

*D. I. Vargas Lascano, H. J. Krahn, N. L. Galambos (University of Alberta), & M. E. Lachman (Brandeis University)*

A stronger sense of personal control over one's own life has been extensively linked to better physical and psychological health as well as better socioeconomic outcomes such as higher earnings, occupational status, and job autonomy (Lachman & Weaver, 1998; Rodin, 1986; Bird & Ross, 1993; Mirowsky & Ross, 1990; Kohn & Slomczynski 1990). Although a sense of personal control plays an important role in human behavior at almost every stage of life, there is little longitudinal evidence about the life course trajectory of this construct. We examined intrainidividual change in personal control in a sample of 971 high school students followed for 25 years from the late teens to middle adulthood. Education has been identified as a potential driving force behind changes in personal control (Mirowsky & Ross, 2007). For this reason, we also investigated the covariation between personal control and education across time through parallel process latent growth models. Sense of personal

control changed in a non-linear fashion across a 25-year period. Participants whose parents had no post-secondary education (PSE) showed lower baseline levels of personal control and less increases in personal control over time compared to participants whose parents had at least one PSE degree. Initial levels of personal control contributed to growth in participants' PSE involvement and growth in personal control covaried positively over time with growth in participants' PSE involvement. The implications of the observed patterns of change in sense of personal control across time and their links to educational experiences are discussed.

11:45 **Differential processing of emotional stimuli in later life**

*L. Bohn, S. Kwong See (University of Alberta), & H. Fung (Chinese University of Hong Kong)*

Our research is grounded in socioemotional selectivity theory (SST; Carstensen, 2006), which argues that goal selection and pursuit are inextricably related to perceived time remaining in life. When the future is perceived as expansive (as in youth), knowledge related goals are prioritized. When the future is perceived as limited (as in old age), emotion regulation goals are emphasized. Proponents of SST argue that goals differentially impact the processing of emotionally valenced stimuli. Termed the positivity effect, older adults, relative to younger adults, place a stronger emphasis on positive information and are less sensitive to or avoidant of negative information. While many studies have found evidence in support of this effect, others have not. The present study sought to clarify these findings by examining attentional and memory preferences in a sample of young, young-old, and old-old adults. Interestingly, the young-old did not evince the positivity effect in recall memory performance, whereas the old-old did. The young-old did demonstrate the positivity effect in recognition memory, however, this effect was more pronounced in the old-old. This finding, that the relative salience of positive information differs between the young-old and old-old, extends previous research and suggests that, as the longevity of people increases, the positivity effect will be visible in the oldest old.

# Invited Presentation (Telus 217/219)

2:00 **Piloting and path integration within and across boundaries**

*Weimin Mou (University of Alberta)*

Three experiments examined whether navigation is less efficient across boundaries than within a boundary. In an immersive virtual environment, participants learned the objects' locations in the presence of a small square room or a large square room. Participants, while blindfolded, then physically walked a circuitous path between the learning position and the testing position. The testing position was inside the large room but outside the small room. Participants pointed to the objects' locations at the testing position. In Experiment 1, the learning room has distinctive walls to indicate unique locations for objects within the room. Half of the participants in each room condition (piloting group) saw the testing room before pointing. In particular, those, who had learned the large room, saw the same large room with the objects removed so as to know their testing position in the same room, whereas those, who had learned the small room, saw a different small room so as to know they were in a different room. The other half of the participants (path integration group) did not see the testing room before pointing. The results showed that pointing accuracy was higher for participants who learned the objects in the large room than those who learned in the small room but only when they were in the piloting group. Experiment 2 removed the possibility that the null effect of boundary crossing on pointing accuracy in the path integration group was because participants in this group did not visually see that they were in the same room or not. Experiment 3 used a simpler circuitous path and replicated the null effect of boundary crossing on pointing accuracy for the path integration group. These results suggested that navigation relying on path integration is not sensitive to boundary crossing whereas navigation relying on piloting is less efficient across boundaries than within a boundary.

# Session 2 (Telus 217/219)

2:30 **Dissociating the position error and heading error of spatial updating during physical and visual locomotion**

*W. Mou & L. Zhang* (University of Alberta)*

Neuroscientific studies have indicated that place cells are sensitive to a specific position and head direction cells are sensitive to a specific heading respectively. In this study, we behaviorally dissociated between the position and heading representations that participants updated after physically walking a path or travelling a path using optical flow only. Results showed that estimations of the self-position and self-orientation were both more inaccurate in visual locomotion than in physical locomotion. However, on the one hand, when a clock wall was added to indicate the orientation during visual locomotion, the heading estimation was improved whereas the position estimation was not. On the other hand, when

participants were disoriented after they physically walked to the testing position, their position estimation was not impaired but the heading error was at the chance level. These results indicate position representation and heading representation can be dissociated behaviorally, and inertial cues available in physical walking are important to updating of both.

2:45 **Song production by female black-capped chickadees: Acoustic features contain sex and identity information**

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

In temperate songbirds, song has traditionally been considered a male-produced vocalization. However, in many temperate songbird species it is now recognized that both males and females produce song. The function and acoustic structure of the two-note fee-bee song produced by male black-capped chickadees (Poecile atricapillus) has been extensively studied, but female-produced song has not been quantitatively examined in this species. In the current study, we recorded both male and female black-capped chickadees producing fee-bee song. Using bioacoustic and discriminant function analyses we examined seven acoustic features within the songs and compared male- and female-produced song. Our results indicate that both male- and female-produced songs are individually distinctive. Additionally, discriminant function analyses correctly classified songs based on the sex of the signaler and the results indicate that at least one acoustic feature, the frequency decrease within the fee note (i.e., fee glissando), varies between the sexes. This statistical classification suggests that sufficient acoustic differences exist within the songs which would allow birds to identify the sex of the signaler; however, further research is needed to determine if black-capped chickadees perceive these acoustic differences in male and female song.

3:00 **Incidence of seizures after cortical versus striatal intracerebral hemorrhage**

*A. Klahr, M. Souza, J. Witzke*, C. Dickson, & F. Colbourne (University of Alberta)*

An intracerebral hemorrhagic stroke, caused when blood vessels rupture, leads to significant immediate, and later secondary, brain injury. Clinical data, though not conclusive, suggests post-stroke seizures could be a cause of further secondary damage after stroke. Subclinical seizures, those not detected by an overt behavior (e.g., convulsions) are easily missed, requiring constant monitoring with an electroencephalograph (EEG). The goal of our study is to document the incidence of seizures after a hemorrhagic stroke in rats. Location of the stroke may influence incidence of seizure. Therefore, a stroke will be induced in rats by injecting collagenase, an enzyme that breaks down blood vessels, in either the striatum or the cortex. The occurrence of seizures will be monitored for a month using video camera recordings and EEG data gathered from implanted telemetry (wireless) probes. Our preliminary data shows seizures do occur in rats after stroke. Our belief, based on the clinical literature, is that when seizures are present, they will be more prone in rats with cortical seizures. Our main endpoints are type, duration and frequency of seizures in rats, as well as behavioural assessment (e.g., NDS) and lesion volume. Once we understand the impact of seizures on neurodegeneration, we will conduct further studies focusing on possible neuroprotective methods, such as anti-epileptic drugs or therapeutic methods. These results can hopefully help us better understand the effect of post-stroke seizures on clinical stroke patients with an emphasis on ways of improving the recovery process.

# Keynote Address (Fine Arts Building 220)

4:00 **Nature versus nurture: Contributions towards healthy cognition from childhood to senescence in mice and humans**

*Veronique Bohbot (Douglas Hospital Research Centre & McGill University)*

A larger hippocampus has been associated with healthy cognition in normal aging and with a reduced risk of numerous neurological and psychiatric disorders such as Alzheimer's disease, Schizophrenia, Post-Traumatic Stress disorder and Depression. The hippocampus is implicated in only one of two navigation strategies utilized when finding one's way in the environment. The spatial strategy, which is allocentric, involves remembering the locations of objects in relation to landmarks in the environment placed in a virtual radial maze. The other, the response strategy, relies on making a series of stimulus-response associations (e.g. right and left turns) until all objects are retrieved. Participants who spontaneously use the spatial strategy (spatial learners) show increased fMRI activity and increased grey matter in the hippocampus relative to those spontaneously using the response strategy (response learners) who show corresponding increases in function and grey matter in the caudate nucleus. Furthermore, spatial and response learners differ in terms of cortisol levels and BDNF genotype. Recent results from our laboratory show a decrease in spatial strategies across the life span, along with a reduction in activity and grey matter in the hippocampus. In order to reverse this process and stimulate the HPC, we spent 5 years to develop a 16-h spatial memory improvement program (SMIP) that promotes the use of spatial strategies in 46 different virtual environments, varying in size and complexity. Results indicate that completion of SMIP was associated with spatial memory improvements, increases in activity and grey matter of the hippocampus. Our findings suggest that spatial memory, which involves learning the relationship between environmental landmarks, is critical to hippocampal function. Furthermore, the SMIP may have a significant effect in reversing hippocampal atrophy associated with normal aging and reducing risks of neurological and psychiatric disorders.

# Poster Abstracts

P01 **Examining Eating Habits of Undergraduate Psychology Students**

*W.L. Salvisberg, P.W. Tom & S.L Ziolkowski (University of Alberta)*

The current study examined the relationship between parenting styles, eating/dieting behaviors and self-esteem in undergraduate psychology students. Standardized assessments of eating/dieting behaviors, parent care and control, and self-esteem were collected from 99 undergraduate psychology students in November 2012. Expected associations of parent care and control with undergraduate students' eating and dieting habits and self-esteem were not found; however, results indicating the influence of maternal and paternal care on potential eating disorder diagnosis and self-esteem were found. Additionally, a predictive relationship was found between eating/ dieting behaviors and self-esteem. Together these results suggest that parent behaviors powerfully influence the development and maintenance of self-esteem and that more research is needed to explore other characteristics of parenting that may be more related to unhealthy eating/ dieting behaviors.

P02 **Undergraduate Awareness and Barriers of University of Alberta Services**

*Cassandra Richards, Michaela Rebus, Nadia Dow, & Sandra Ziolkowski (University of Alberta)*

The purpose of this research project was to assess undergraduate student awareness of University of Alberta programs and services, and to identify specific barriers, which may prevent access to these services. The study sample consisted of 92 PSYCO 104 students from the University of Alberta research pool. Participants completed a survey that consisted of multiple choice questions, short answers, and a likert scale. The questions surrounded participant awareness and use of academic programs (e.g. Honor's Program), health and wellness services (e.g. Mental Health Centre), and student services (e.g. University Career Centre (CAPS)). The results showed that the majority of first-year students were not aware of many programs or services at the University of Alberta in general, but many were aware of the health services that were offered. Results regarding the main barriers preventing access to programs and services were lack of time and lack of information regarding how to access services and the benefits of including oneself in the programs offered at the University of Alberta. These findings should inform future research into student awareness deficits and other barriers to accessing university programs and services. As well, future research can explore what types of awareness campaigns are the most successful and which ones could potentially use work. Similarly, this knowledge may inform University services on how they may be able to better serve students in the future.

P03 **Personality And Gesture: Does Being Extroverted Lead To More Gesturing?**

*S. O'Carroll and E. Nicoladis (University of Alberta)*

In this study we aim to see if there is a correlation between personality traits and gesturing. We also aim to see whether or not there is a difference in gesturing when the listener is visible to the speaker (screen down condition) compared to when they are unable to see each other (screen up condition). Through the use of an object description task, the number of gestures in each condition, screen up and screen down, are coded and then compared to the results of the participants' personality test.

P04 **Subjective age and coping strategies predict daily affect in first-semester university students**

*S. Fang & N. L. Galambos (University of Alberta)*

The first semester of university presents opportunities for and challenges to psychological well-being as students encounter escalating academic demands and enter new social contexts. Individual differences in self-perceptions of maturity (i.e., subjective age) and coping styles may impact students' emotions in the stressful transition to university. The present study examined how subjective age and coping strategies were related to first-year university students' positive and negative affect across a two-week period in their first semester of university. One hundred ninety-three students answered baseline questionnaires asking about their subjective age (i.e., how old they felt) and how they coped in stressful situations (Coping Inventory for Stressful Situations – CISS). The CISS measured task-oriented coping strategies (the extent to which problem-solving was used) and avoidance-oriented coping strategies (e.g., shopping).

Subsequently, students completed web-based daily diaries indicating their positive and negative affect on 14 consecutive days. Data were analyzed using Hierarchical Linear Modeling (HLM) software. The results show that and older subjective age and both task-oriented coping and avoidance-oriented coping strategies predicted more positive affect across the 14 days. Possible explanations are discussed.

P05 **Young Adults' Perceptions of Old and Young Confederates in a Referential Communication Task**

*Lian Liu, Linzy Bohn, & Sheree Kwong See (University of Alberta)*

Young adults have overgeneralized beliefs (stereotypes) about aging and older adults. In North America old age is associated with beliefs such as poor memory and hearing loss. Negative stereotypes can impact perceptions of older people and intergenerational interaction in detrimental ways. Our study examines perceptions and differential behaviors directed towards older versus younger confederates within the context of a referential communication task. The data reported here are on perceptions of old and young people generally (age stereotypes) and the old and young confederates in the experiment. When participants were shown pictures of young adults and older adults and were asked to provide ratings on a number of measures, we found evidence of cultural stereotypes of aging. In the referential communication task participants described block patterns to a young then old confederate (order counterbalanced) behind a screen who built the pattern based on only the description. Young adults' ratings of the old confederates they interacted with in the task were more negative than ratings of young confederates, even though accuracy of the young and old confederates in the task was not different. The results suggest perceptions reflect age-based beliefs about the older confederates rather than perceptions of performance. Young adults attributed errors by older confederates in the task to poorer memory and hearing. The results provide evidence that cultural age stereotypes bias young adults' perceptions of old people during intergenerational interactions.

P06 **Fun and games — and research: simplifying complex working memory tasks for young children**

*Mahsa Khoei, Alexandra Racic, Aishah Abdul Rahman, Diya Shi, Cheri Bastien, Luiza Deaconescu, & Sandra A. Wiebe (University of Alberta)*

Working memory (WM) is the ability to store and manipulate information in mind to guide goal-directed behavior (Baddeley, 1992). Complex span tasks are considered "gold standard" measures of WM as they engage both storage and processing aspects of the WM (Conway, Kane, & Engle, 2003; Daneman & Carpenter, 1980). However, existing complex span tasks are often confusing and unengaging for young children. In this poster, we document a pilot study conducted to develop the Listening Recall Task (Gathercole & Pickering, 2000) into a child-friendly, game-like task that continues to engage both storage and processing yet is comprehensible and engaging for children. Participants included 36 5- to 7-year-old children (Mage= 6 years and 2 months, SD= 1 month; 18 girls). Stimuli on each trial were a series of sentences using age-appropriate vocabulary to describe familiar concepts. Children are asked to listen to a series of sentences (initially 2) and, after each sentence, tell the examiner whether it was true or false (e.g., "toys are fun", true; "strawberries are blue", false). After hearing both sentences, they must repeat the final words of each sentence, in the same order presented ("fun", "blue"). Initially the task was administered as described in the existing literature, and based on children's performance and the examiners' observations, we progressively implemented a series of modifications (e.g., changing the way the concepts of true and false were presented; introducing toy characters to the game; providing more examiner support). This poster will describe how the implemented changes affected children's task performance.

P07 **Do children need to justify their behaviour?**

*A. Santarossa, B. Zalkind, L. Smithson, & E. Nicoladis (University of Alberta)*

Previous research has shown that adults often justify their behaviour in such a way that it seems consistent with their own understanding of themselves. In the present study, we test whether the same is true of children. We ask four and five year old children to label themselves (gender, good/bad) and behave in such a way that could be seen to be inconsistent with those labels (e.g., a girl playing with a car; a boy playing with a pink toy). Preliminary data suggest that children may attempt to justify apparently inconsistent behaviour with their gender identity but not about their good/bad self-conception. We discuss these results in light of the development of a narrative self.

P08 **Parent-Teacher Communication and Adjustment Problems in Middle Childhood**

*Shayla R. Richards & Wendy L. G. Hoglund (University of Alberta)*

Research indicates that parent involvement in schooling, such as the degree to which parents communicate with their child's teacher, can reduce children's risks for internalizing (e.g., symptoms of depression, anxiety) and externalizing (e.g., aggressive behaviors) problems in school (Hill et al., 2004; Warner, 2010). However, the degree to which parent-teacher communication relates to children's adjustment is likely influenced by multiple factors, including the quality of relationships among children, teachers and parents (Pomerantz et al., 2007). The current study examines how growth in parent-teacher communication relates to growth in child adjustment problems. We further examine how these associations vary by levels of parent-teacher, child-teacher and child-parent relationship quality. Participants included 317 low-income, ethnically diverse children in Kindergarten to grade 3 and their parents. Data were collected on three occasions over the course of one school term. Parents reported on their communication with teachers and relationship quality with both teachers and their child. Teachers reported on children's internalizing and externalizing problems and on their relationship quality with children. As expected, associations between parent-teacher communication and child internalizing and externalizing problems varied by parent-child and teacher-child relationship quality. Parents and teachers increased their communication in response to children's adjustment problems when teachers and children shared a higher quality relationship but decreased their communication when parents shared a more positive relationship with their child. These associations did not vary by parent-teacher relationship quality. Findings from this study contribute to the understanding of the context under which parent-teacher communication may support children's adjustment.

P09 **How Culture Shapes Perspective in Art Production Throughout Development**

*Kristina Nand, Sawa Senzaki, & Takahiko Masuda (University of Alberta)*

Previous studies found that there are cultural variations in perspective in representations of artistic landscapes. Specifically, Eastern paintings have higher horizons than Western paintings, providing a bird's eye view to incorporate more contextual information into the frame. These cultural patterns of perspective in art were furthermore replicated in landscape illustrations by East Asian and Western university students (Masuda, Gonzalez, Kwan, Nisbett, 2008), and such culturally specific patterns were also observed among elementary school children once they understood the concept of a horizon, with Japanese children drawing the horizon higher than Canadian and having more objects in their landscapes (Senzaki & Masuda, 2013). An intriguing finding from these studies is that children showed a stronger cultural bias than university students. Thus, do cultural variations in landscape drawing style gradually weaken as people mature? Or, are there any significant periods during adolescence which indicates significant changes in drawing style? To comprehensively understand developmental trajectories in relation to perspective and art, we examined how secondary school students in Japan created landscapes. Results indicated that Japanese secondary school children generally showed similar aesthetic perspectives to their primary school and university counterparts by drawing high horizons and providing more contextual information; however such cultural biases observed in Japan were somewhat weak in certain grades. We will discuss the influence of picture books on Japanese elementary school children and that of Western culture on Japanese adolescents and young adults as causes of the strong and weak cultural biases, respectively. We will also discuss future data collection from Canadian secondary students.

P10 **Rapid Screening of Differential Cognitive Deficits in Schizophrenia and Substance Induced Psychosis**

*Si Victoria Tian, Dan Lafreniere, Leslie Roper, Stacy Purser, Alyssa Kluk (Alberta Hospital Edmonton & University of Alberta), Phil G Tibbo (Dalhousie University), Scot E Purdon (Alberta Hospital Edmonton & University of Alberta)*

Schizophrenia and substance-induced psychoses have similar clinical presentations (phenotypes) but are presumed to have different etiology or pathogeneis. A simple bedside screen for differentiation between the two types of psychosis would have clinical value. Ninety-nine individuals suffering from a psychotic disorder were administered a Structured Clinical Interview for DSM-IV-TR and classified into a schizophrenia (n=66) or a substance-induced psychosis (n=33) subsample. All were also administered a measure of premorbid intellect (WRAT-4 Reading) and a brief tests of cognitive status (Screen for Cognitive Impairment in Psychiatry, SCIP, Purdon 2005). Premorbid intellect was equivalent between groups but a trend was observed towards lower current cognitive status in the schizophrenia group, (p=0.11). Subscales from the SCIP showed no difference between groups in SCIP verbal list learning, delayed recall, or verbal fluency, but the schizophrenia group was worse on the SCIP test of verbal working

memory (t(97)=2.37, p=0.020, r=0.23) and visuomotor tracking (t(97)=2.14, p=0.035, r=0.0.21). The SCIP may have some value in differentiating between psychoses that are similar in phenotype but etiologically distinct.

P11 **Stigma-related empathic attitudes and behaviour associated with sub-clinical characteristics of psychosis in the observer**

*Alyssa Kluk, Si Victoria Tian, Dan LaFreniere, Angela Beierbach (Alberta Hospital Edmonton & University of Alberta), Cam Wild (University of Alberta), Philip G Tibbo (Dalhousie University), Jody Wolfe (University of Alberta), & Scot E Purdon (Alberta Hospital Edmonton & University of Alberta)*

Stigma may instill negative attitudes towards individuals with mental illness which could potentially decrease willingness of affected individuals in seeking treatment. Stigma-related attitudes and behaviour may be influenced by personality characteristics related to psychosis. Unusual ideation, for example, may render an observer more empathetic to people experiencing a psychotic episode. Alternately, social anhedonia may render them less empathetic. Healthy high school students (N=277, 170 F, 108 M, M age = 17.44, $\sigma$ = 1.39) completed the Magical Ideation Scale (MIS), the Social Anhedonia Scale (SAS), and an assessment of stigma-related attitudes and behaviors with an Attribution Questionnaire that describes a young man in a first episode of psychosis. Although the effect was small, the MIS was predictive of intended empathetic behaviour, b=.13, t(277)=2.25, p<.025, R2 =.014, F(1, 277)=5.07, p<.025. A reverse pattern of similar magnitude was apparent for expressed attitudes, b=-.19, t(277)=-3.18,p<.002, R2 =.032, F(1,277)=10.11, p<.002. As anticipated, SAS was slightly predictive of empathetic attitudes, b=-.17, t(277)=-2.90, p<.004, R2 =.026, F(1,277)=8.42, p<.004. Contrary to expectations, SAS was not related to intended empathetic behaviour. Trait-related personality characteristics may be associated with stigma, but there appears to be a significant divergence between empathic attitudes and intended behaviour.

P12 **Effects of mindfulness training on emotion-cognition interactions in adolescents with mental health disorders**

*Vivian Chan, Sasha Vulic, Andrea T. Shafer, Sunita Vohra (University of Alberta), Florin Dolcos (University of Illinois Urbana-Champaign), & Anthony Singhal (University of Alberta)*

Mindfulness therapy (a meditation based therapy) has been shown to be effective in alleviating symptoms of depression in adults. This is thought to occur through a strengthening of neural mechanisms responsible for executive functions (e.g., attentional control). Extant research points to the adolescent population as being the most vulnerable to affective mental health problems. Moreover, once diagnosed this population is associated with higher incidence of relapse, heightened resistance to therapy, and other long-term varied health problems. Thus, it is of paramount importance to understand and implement effective therapeutic interventions in an adolescent population. With research on mental health in adolescence being strikingly sparse, whether or not mindfulness therapy is effective in an adolescent population remains unclear. This issue was investigated in 25 adolescents with mental health disorders. All participants underwent a baseline assessment and brain imaging (functional magnetic resonance imaging) session upon intake to a residential treatment facility. Twelve adolescents received mindfulness therapy in addition to their normal treatment protocol, while 13 only received the normal treatment protocol. Following eight weeks of treatment, one mindfulness therapy session/week, participants completed another assessment and brain imaging session. During the brain imaging session participants performed an emotional oddball task that has proven effective in measuring emotion and attentional control processes separately, as well as the interactions between them. Preliminary analysis of behavioral data showed an effect of mindfulness therapy on distracter and target processing, but changes in emotion modulation across pre- and post-treatment sessions were identified only for distracter processing. Preliminary analysis of brain imaging data will also be discussed.

P13 **Giant Steps In Interpreting PDP Networks For Jazz Progressions**

*Michael R.W. Dawson and Joshua Hathaway (Biological Computation Project, University of Alberta)*

Connectionist research on musical cognition is romantic in nature because researchers attempt to use networks to explore the sublime: aspects of music that cannot be formalized. However, if one interprets the internal structure of trained networks, then one can find that networks represent interesting and surprising formal properties. For instance, networks trained to process musical chords frequently represent notes using equivalence classes defined by "strange circles" of major seconds and major thirds. Below we show that these strange circles can be discovered in very simple networks trained to generate two important chord progressions for jazz, the II-V-I and the Coltrane changes. Network interpretation is a reliable source for discovering new formalisms that can be used to represent musical structure, and to inspire new musical creations.

P14 **Timbre Influences Saliency of Auditory Stimulus Properties**

*Lee M. Vilinsky, Pardeep Kang, Christopher B. Sturdy (University of Alberta)*

The pitch of a sound is commonly referred to as the percept of its frequency. A sound that has consonance/dissonance is heard as stable/unstable, respectively. Together, these properties provide more information in a stimulus than their absence. However, the extent to which the saliency of these properties varies as a function of timbre, a property that distinguishes two sounds of the same pitch and loudness, is unknown. We examined how the presence or absence of timbre influences response strategies in a go/no go operant task where human subjects had to discriminate musical intervals. Each subject was randomly assigned to one of two groups in which the stimuli presented were a specific timbre: sine waves or piano. Over 96 trials, each subject heard five stimuli (minor second, tri-tone, perfect fifth, major seventh, and octave) chosen at random, but only one stimulus was reinforced while the other four were non-reinforced. In a subsequent phase, they were exposed to the same stimuli created using a different root note in order to test for generalization. We compared response rates between each group's reinforced stimulus (hits) to their respective non-reinforced stimuli (false alarms) over time. Subjects that were exposed to sine waves had proportionally higher error rates to stimuli that were close in pitch. Furthermore, subjects exposed to piano sounds had proportionally higher error rates to stimuli that were similar in consonance/dissonance. These findings show that timbre modulates whether consonance/dissonance or pitch is more salient as a cue for auditory discrimination.

P15 **Task-dependent Octave Equivalence in Humans**

*John Hoang, Marisa Hoeschele, Ubah Mohamoud (University of Alberta), Ron G. Wiesman (Queens University), & Christopher B. Sturdy (University of Alberta)*

Octave equivalence is the perception of notes differing in pitch by one or more octaves as similar (also described as pitch chroma perception). Accurate 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, two notes separated by one-third octave may sound less similar than two notes separated by a full octave because the notes have the same pitch chroma, despite the larger difference in pitch height. The perception of octave equivalence in humans is often observed, for example when choir members sing, harmonization requires members to match notes in different octaves. Previous research has yielded confusing results: past studies indicate musical training can improve octave equivalence but other research has found non-musicians can also perceive equivalence. Here, we tested for octave equivalence using a Go/No-Go discrimination task that divides the twelve note chromatic scale into either half-octaves (top six and bottom six notes) or middle-octave (bottom three, middle six, and top three notes), participants were reinforced during training for responses to the bottom or middle range. We observed octave equivalence as generalization in the middle-octave but not in the half-octave task. Generalization in the middle-octave task only occurs from the fourth octave to the fifth octave but does not generalize to the sixth octave. Results suggest that use of octave generalization is task dependent and generalization over multiple octaves may be limited by the interference of pitch height or higher harmonics.

P16 **The Embodiment of Mind Wandering**

*J. Farley (University of Alberta) & A. Kingstone (University of British Columbia)*

Attentional states fluctuate across time and embodied cognition predicts that these states may be observed in motor activity (i.e., fidgeting). The present study addresses the related research questions of i) whether fidgeting is predictive of attentional state, and ii) whether related visual cues are spontaneously used to infer these states in others. In the first experiment, participants watched a video lecture and self-reported their attentional state at regular intervals. These viewing sessions were recorded and at the end of the lecture comprehension was assessed for each interval. Motor activity was subsequently quantified and found to be negatively correlated with both subjective (self-report) and objective (comprehension) measures of attentional state, providing converging evidence that such activity may index attentional fluctuations in certain contexts. In the second and third experiments, new participants viewed clips randomly drawn from those recorded during the first experiment and made judgments about the attentional state of the participants within. In addition to gauging their perceived attention level, the new participants provided free-form written explanations outlining which cues/heuristics they used in forming their judgements. Participants were able to (relatively) accurately infer the self-reported attentional state of the individuals in the videos. Furthermore, certain cues (including fidgeting) were reliably invoked as evidence for their judgements. These results support the notion that people tend to fidget as their attention wanes, as well as suggesting that such cues are both readily interpreted and actively utilized in the context of inferring attentional states of others.

P17 **A comparison of measures of semantic transparency in English compounds**

*Kelly Nisbet, Sarah Cheung, Christina L. Gagné, & Thomas L. Spalding (University of Alberta)*

Compound words (e.g., hogwash) consist of more than one constituent (e.g., hog + wash). Constituents vary in semantic transparency; opaque constituents do not contribute to the compound's meaning whereas transparent constituents do. The aim of this study is to compare different measures of semantic transparency to determine whether they differ across compound type and to see whether the different measures reflect the same aspect of transparency. The measures used in this study include linguistic classification, Latent Semantic Analysis (LSA), and participant ratings. Prior to the experiment, the constituents of compound words were classified by the researchers as transparent or opaque using linguistic criteria . Additionally, LSA scores were obtained for each of the constituents in relation to the whole word. For the experiment, two types of ratings were collected. First, participants rated the compound on "the extent to which the word parts contribute to the overall meaning" and, second, participants rated both constituents independently on "the extent to which the word parts retain their meaning in relation to the whole word". The data show that participant ratings cannot be predicted from LSA scores or linguistic classification. This 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 processing compound words. The results suggest a process of meaning construction that draws on multiple sources of conceptual, semantic, and morphological information.

P18 **Modelling Congruity Effect with Relative Order Judgment Across Scales**

*Yang S. Liu & Jeremy B. Caplan (University of Alberta)*

The judgement of relative order (JOR) procedure is used to investigate serial-order memory. Previously we found that both error rates and response times to "which item came earlier" favour earlier serial positions whereas responses to "which item came later" favour later serial positions on both subspan [list length (LL) = 4 consonants] and supraspan (LL = 6, 8, 10 nouns) lists. A scale-invariant, temporal distinctiveness-based direct-access model (SIMPLE; Brown, Neath, & Chater, 2007) with an added gradient of discriminability across serial positions provide a unified qualitative account of congruity effect on error rates. In the present study, we tested the same relative order judgement using pairs of English alphabet (LL = 26), to investigate the congruity effect in longer, semantic-memory lists. We found a reliable congruity effect, along with serial position and distance effects. Semantic lists present a challenge to SIMPLE, as temporal information can no longer be used to compute discriminability. We therefore, instead, apply Slow Fast-Guessing Theory (Petrusic, 1992), an accumulator model, to the congruity effect in response times and error rates across scales. This analog model can produce congruity effects, but additional assumptions are required to model serial position effects.

P19 **Get Out Of The Corner: Inhibition and the Effect of Location type and Number on Perceptron and Human Reorientation**

*B. Dupuis & M.R.W. Dawson (University of Alberta)*

Spatial learning and navigation has been frequently investigated using a 'reorientation task' paradigm [Cheng, K., 1986. A purely geometric module in the rat's spatial representation. Cognition, 23(2), 149–78]. However, implementing this task typically involves making tacit assumptions about the nature of spatial information. This has important theoretical consequences: theories of reorientation typically focus on angles at corners as "geometric cues" and ignore information present at non-corner locations. We present a neural network model of reorientation that challenges these assumptions, and use this model to generate predictions in a novel variant of the reorientation task. We test these predictions against human behaviour in a virtual environment. Networks and humans alike exhibit reorientation behaviour even when goal locations are not present at corners or when additional locations are present. Our simulated and our experimental results suggest that angles are processed in a manner more similar to features, acting as a "focal point" for reorientation, and that the mechanisms governing reorientation behaviour may be inhibitory rather than excitatory.

P20 **Simple Neural Networks And Bayesian Inference: A Computational Account**

*Michael R.W. Dawson, Brian Dupuis and Sheldon Jans (University of Alberta)*

There is a growing movement in cognitive science to replace the logicism that defines classical cognitive science with a new formalism, probability theory. Inevitably this leads to using Bayesian inference as a norm to which human cognition can be compared. Critics of this perspective argue that Bayesians study cognition exclusively at the computational level. Bayesians themselves suggest that lower level accounts (algorithmic, architectural, implementational) will at best approximate Bayesian theory. Some critics contend that biologically plausible mechanisms capable of implementing Bayesian theory have not been found. Here we show that simple artificial neural networks may serve as Bayesian mechanisms. Simulation studies show that these networks generate responses consistent with Bayes' rule. Formal analyses prove that one can translate Bayes' rule into the parameters that describe network structure. Posterior perceptrons don't approximate Bayes – they bring it to life!

P21 **Emotional arousal disrupts associative learning: Evidence from simultaneous fMRI and eyetracking**

*C. R. Madan (University of Alberta & University Medical Center Hamburg-Eppendorf), J. B. Caplan, E. Fujiwara (University of Alberta), & T. Sommer (University Medical Center Hamburg-Eppendorf)*

Emotional experiences are often remembered better than neutral ones. Due to the self-important nature of emotional experiences, one might also expect it would be adaptive to remember information related to emotional better than information related to neutral experiences. However, behavioural studies are now finding that association-memory is in fact impaired by emotional arousal. We hypothesized that this reduced association-memory is caused by reduced hippocampal engagement during study of emotional pairs compared to neutral pairs. We tested for this pattern of influence on hippocampal, as well as amygdalar, engagement during picture-association-learning with fMRI, and on fixation patterns with concurrent eyetracking. Behavioural results replicated the impairment of pairs of emotional items relative to pairs of neutral items using image stimuli and a 5-alternative forced choice associative recognition task. Subsequent memory effect (SME) analyses showed that the hippocampus was engaged more for correctly later-recognized emotional than neutral pairs. No SME was found in the amygdala for emotional pairs. The eye-fixation patterns showed a SME: Association-memory was better when participants made more saccades between the two images of a pair. Saccades between images may reflect a participant trying to relate to-be-associated items to one another. Additionally, participants made fewer saccades between the items of emotional pairs than neutral pairs. Taken together, effects of emotional arousal led to decreased hippocampal engagement and in-turn impaired learning of emotional than neutral pairs. Results further suggest that impaired association-memory due to arousal may be driven by modulating distribution of attentional allocation during association learning.

P22 **The brain's representation of stimuli may be compatible with convolution-based memory models**

*Kenichi Kato & Jeremy B. Caplan (University of Alberta)*

Convolution is a mathematical operation used in vector models of memory that have been successfully in explaining a wide range of human memory behavioural data, including memory for associations between pairs of items. When naturalistic signals, such as visual images, are stored and retrieved in a convolution model, the retrieved image does not look similar to the original (target) image. The problem is caused by autocorrelation of the cued image. Rather, it has long been known that convolution models only work effectively if items have statistical properties that resemble white noise. This, understandably, has been a weakness of convolution as a plausible account of human memory. It has also long been known that the visual system tends to reduce such a effect of autocorrelation. On-center ganglion cell in the retina has this effect, approximating a difference-of-Gaussians (DoG) filter. A DoG filter enhances edges, but it also turns natural images into images that are closer to being statistically like white noise. We applied a DoG filter to natural images and encoded, then retrieved pairs of these stimuli using convolution and correlation. The DoG images survived the convolution model better than naturalistic images. There were more altered than precisely-whitened images, but apart from a high-frequency distortion, resembled the original DoG images well. Thus, the way in which brains represents information may act synergistically with the constraints required by convolution models, strengthening the case for their neural plausibility.

P23 **Memory encoding and retrieval oscillations are related**

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

Memory-related EEG oscillations at study show analogous effects on memory. At study, the subsequent memory effect (SME; activity during hits minus activity during misses), points to alpha (8-12 Hz) desynchronization and concurrent theta (4-8 Hz) synchronization associated with better subsequent memory (Klimesch, 1997, 1999). At test, the retrieval success effect (RSE) also reveals reduced alpha and increased theta power associated with better memory (Burgess and Gruzelier 1997, Düzel et al, 2003, 2005; Klimesch, 1997). We hypothesized that reduced alpha (visual attention) combined with theta synchronization reflects activation of item-context representations at both study and test. We tested the prediction that memory-related oscillations at study would correlate with the same memory-related oscillations at test, across participants. Participants were given 9 25-word lists for study, each followed by old/new recognition. Findings replicated the alpha/theta pattern for both the SME and RSE, using a duration-of-oscillation measure that has high sensitivity to rhythmic activity relative to non-repeating signal that has energy at a particular frequency (Caplan et al., 2001). More specifically, we found support for our prediction: SME and RSE correlated positively in the alpha band at electrode Oz [$r(29)=0.94$, $p<0.01$] and the theta band at Fpz [$r(29)=0.66$, $p<0.01$]. Thus, study and test oscillatory patterns explained common subject variability and indicate that alpha may have a similar effect on memory function during study and test, and the same may be true for the involvement of theta.

P24 **Functional Specialization of the Right Hemisphere for Memory-Guided Sensorimotor Tasks**

*Sylvia Romanowska, Larissa M. Shapka, Leanna C. Cruikshank, Jeremy B. Caplan, & Anthony Singhal (University of Alberta)*

The N170 event-related potential is an indicator of ventral-stream engagement and is associated with visual perceptual functioning. Recently, it has been suggested that the N170 may reflect more general ventral-stream processes, and evidence has linked this component to motor planning and perception for action (Cruikshank et al., 2012). A more negative amplitude N170 in memory-guided reaching tasks is thought to be indicative of an increase in ventral-stream activity, as memory-guided tasks rely heavily on perception-based information. We hypothesized that sensorimotor tasks performed with opposing hands would exhibit a lateralization effect, as reflected by the N170 amplitude. Initial studies by Cruikshank et al. (2012), determined that when participants completed a reaching task with their right hand, the N170 amplitude was more negative in the left hemisphere. If the proposed lateralization exists, it is predicted that the amplitude of the N170 should be most negative over the right hemisphere when the left hand is used. Previous studies have indicated that the left hemisphere is functionally specialized for visually-guided actions (Gonzalez, Ganel, & Goodale, 2006). Similarly, we predicted that the right hemisphere would be functionally specialized for memory-guided action. Participants performed a reaching task while electrical activity was recorded via electroencephalography. They were auditorily cued to touch target dots on a touchscreen in two conditions. One condition was visually-guided, while the other was memory-guided. Preliminary results of right-handed participants suggest that the N170 is larger in amplitude for

memory-guided actions, as opposed to visually-guided actions. This effect is observed over both the left and right ventral stream regions. This result is a direct replication of what was found in the aforementioned Cruikshank et al. study. ERP results suggest that a laterality effect exists for memory-guided actions. Hemispheric differences were also suggested in the behavioural results – when using the right hand, visually-guided actions were performed better than memory-guided actions with respect to absolute errors made. When using the left hand, participants performed memory-guided actions better than visually-guided actions.

P25 **ZENK immediate early gene expression in female black-capped chickadees in response to songs produced by dominant or subordinate males**

*Daniel Lee, Allison H. Hahn, Marisa Hoeschele, Lauren M. Guillette (University of Alberta), Ken A. Otter (University of Northern British Columbia), & Christopher B. Sturdy (University of Alberta)*

Black-capped chickadee (Poecile atricapillus) males produce a two-note fee-bee song, important for mate attraction and defending a territory. Acoustic features within the song contain information regarding a male's dominance rank. When presented with songs produced by dominant or subordinate males, the behavioural responses of female black-capped chickadees differ according to the acoustic signals based on dominance rank. In the current study, we examined the underlying neural correlates of dominance perception in black-capped chickadees by examining immediate early gene (ZENK) expression in the telencephalic auditory areas of female black-capped chickadees presented with playback of fee-bee songs produced by males of varying dominance status. Specifically, we wanted to determine whether neural response varies with the perceived dominance status of males conveyed by the fee-bee song. During playback, female black-capped chickadees were presented with either: dominant songs, subordinate songs or dominant songs played in reverse (i.e., control condition). We quantified and report on ZENK induction in the caudomedial mesopallium and the caudal medial nidopallium. The relationship between ZENK expression and dominance are discussed.

P26 **2,2 Dipyridyl Or Bipyridine, An Iron Chelator, Does Not Reduce Intracerebral Iron Toxicity Or Improve Outcome After Intracerebral Hemorrhagic Stroke In Rats**

*Jayalakshmi Caliaperumal, Shannon Wowk, Sarah Jones, Yonglie Ma & Frederick Colbourne (University of Alberta)*

An intracerebral hemorrhage (ICH) causes considerable tissue destruction from mechanical trauma with later secondary degeneration. Iron is released from degrading erythrocytes over days, which causes secondary damage by increasing free radicals. Iron chelators, such as deferoxamine, lessen injury, but not all studies support this claim. Due to the conflicting results of DFX, we chose to study another iron chelator 2,2' dipyridyl (or bipyridine - a ferrous iron chelator) as it has better membrane permeability. So we wanted to test whether bipyridine will decrease injury after ICH. In experiment 1, rats were given a collagenase-induced striatal ICH. In experiments 1 and 3, we tested whether behavior was improved (e.g., walking) from administering bipyridine (25mg/kg/day, 12 hours after surgery for 3 days). Rats were euthanized after 7 days to determine non-heme iron levels in the brain. In the second experiment, rats were injected with bipyridine (20mg/kg) 6 hours after collagenase infusion and every 24 hours till euthanasia at 3 days for measuring edema. In experiment 3, after injecting $FeCl_2$ in the striatum, rats were given bipyridine (25mg/kg every 12 hr starting 2 hours prior to surgery for 3 days). The volume of tissue loss and fluoro-jade staining (degenerating neurons) was measured. We found that bipyridine did not improve behavioral or histological outcome or reduce edema in either the collagenase ICH or $FeCl_2$ model. Bipyridine also did not affect parenchymal non-heme iron level. In conclusion our data suggests that bipyridine on its own is not an effective strategy for ICH.

# Campus Map


Presentations and Posters

Keynote Address

Psychology Department