

# BRIAN HARDER

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## HONOURS DAY CONFERENCE

A day to celebrate Undergraduate Psychology Honours Students



MONDAY 11<sup>TH</sup>  
APRIL 2016  
9:30AM - 3:45PM



EDMONTON  
CLINIC HEALTH  
ACADEMY  
(ECHA), L1-140



### KEYNOTE SPEAKER

Dr. Michael A. Hogg

Claremont Graduate University

Extremist Groups, Autocratic Leaders and  
Zealous Followers: Some Consequences of  
Identity Uncertainty

11:00am - 12:00pm

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ORAL PRESENTATIONS ALL DAY · POSTER SESSION: 12:00PM – 1:15PM

more info: [psych.ualberta.ca](http://psych.ualberta.ca)



UNIVERSITY OF ALBERTA  
DEPARTMENT OF PSYCHOLOGY

# About Brian Harder

Emerging from a small rural community and influenced by the Mennonite Brethren, Brian began his academic career at the University of Alberta in 1984. In his second year he majored in Drama, which likely reflected his continuing interest in creativity and creative expression. After his second year, Brian decided to travel for a year. He frequently sought out situations he knew would challenge his personal philosophies and resourcefulness; so he undertook the journey alone. He visited Europe and the Middle East and was particularly enamoured of Turkey.

In 1987 he entered the Psychology undergraduate honors program and graduated with first class standing in 1989. He married Joan Fitzpatrick in July of that year. He began his graduate studies at the University of Alberta in September 1989 and was studying dreams and the psychology of self with Professor Don Kuiken.

Brian died in July 1990 of a brain aneurysm at the age of 28. Many were shocked at Brian's untimely death. However, Brian knew he was at risk; he had already survived one aneurysm a number of years earlier. But Brian chose to live life in a way that was most meaningful to him. He was a thoughtful and contemplative individual, as much a philosopher as a psychologist. He often chose to ask the most difficult questions both of himself and of others. As a consequence, he encouraged others to think deeply about those things that matter most.



# Program

- 9:30AM - 10:45AM ▶ **Oral Presentations:**  
**3<sup>rd</sup> Year Psychology Honours Students**  
Nancy Lei • Lexi Brunner • Vivian Tran • Devyn Rorem • Jasmine Aziz
- 10:45AM ▶ **Break**
- 11:00AM - 12:00PM ▶ **Keynote Speaker:**  
Dr. Michael Hogg, Professor  
Department of Psychology,  
Claremont Graduate University
- 12:00PM - 1:15PM ▶ **Lunch & 4<sup>th</sup> Year Poster Presentations**
- 1:30PM - 2:30PM ▶ **Oral Presentations:**  
**3<sup>rd</sup> Year Psychology Honours Students**  
Samantha Fu • Taryn Buoy • Emily Friesen-Peters •  
Kelly-Ann Albrecht
- 2:30PM ▶ **Break**
- 2:45PM - 3:45PM ▶ **Oral Presentations:**  
**3<sup>rd</sup> Year Psychology Honours Students**  
Alex Choy • Sarah Poirier • Michael Warren • Chris Linden



## **Extremist Groups, Autocratic Leaders and Zealous Followers: Some Consequences of Identity Uncertainty**

**11:00am, ECHA L1-140**

**Dr. Michael A. Hogg  
Claremont Graduate University**

Feelings of uncertainty about one's self and identity can be resolved by identifying with groups, particularly highly distinctive and clearly defined groups. This fundamental premise of uncertainty-identity theory (Hogg 2007) is well supported. Today I explore how this uncertainty-identity dynamic may also lead people to identify with extremist groups, endorse autocratic leaders, and become zealous followers (Hogg, 2014). In support of this analysis I describe three studies.

The first (N = 82) showed that elevated self and identity uncertainty caused relatively moderate students to be more prepared to identify with and endorse the actions of extremist student action groups (Hogg, Meehan & Farquharson, 2010).

The second study (N = 215) showed that elevated identity uncertainty was associated with greater support for autocratic organizational leadership among business employees who generally preferred democratic leadership (Rast, Hogg & Giessner, 2013).

The final study (N = 218) focused on fraternities and sororities to investigate the conditions under which some individuals go to greater extremes for their group than do others (Goldman & Hogg, in press). It showed that the most extreme intergroup behavior was displayed by strongly identified members who were uncertain about their membership credentials and who believed that extreme behavior was likely to confirm membership – and that this behavior was most pronounced among males in fraternities. The implications of this research program for group dynamics, the behavior of group leaders, and the wider psychology of zealotry and fanaticism are discussed.

## Keynote Speaker Bio

DR. MICHAEL A HOGG (PhD Bristol, UK) is Professor of Social Psychology and Chair of the Social Psychology Program in the Department of Psychology at Claremont Graduate University, and is an Honorary Professor of Social Psychology at the University of Kent. He is a former President of the Society of Experimental Social Psychology, and is a Fellow of the Association for Psychological Science, the Society for Personality and Social Psychology, the Society of Experimental Social Psychology, the Society for the Psychological Study of Social Issues, the Western Psychological Association, and the Academy of the Social Sciences in Australia.

Dr. Hogg studied psychology at Birmingham University and obtained his PhD from Bristol University. He taught at Bristol University, Macquarie University and the University of Melbourne; and at the University of Queensland where he founded the Center for Research on Group Processes, served as Associate Dean of Research for the Faculty of Social and Behavioral Sciences and was an Australian Research Council Professorial Fellow. He also taught at Princeton University, and has been a visiting professor at the University of California, Los Angeles; the University of California, Santa Cruz; City University, Hong Kong; and the University of California, Santa Barbara. He joined the faculty of Claremont Graduate University in 2006.

Michael Hogg is a former Associate Editor of the *Journal of Experimental Social Psychology*, and, with Dominic Abrams, he founded and is Editor-in-Chief of *Group Processes and Intergroup Relations*. He has served as Guest Editor or on the editorial board of the most influential journals in the field, including *Journal of Personality and Social Psychology*, *Personality and Social Psychology Bulletin*, *European Review of Social Psychology*, *Journal of Social Issues*, *Social Psychology Quarterly*, *The Leadership Quarterly*, *British Journal of Social Psychology*, *Group Dynamics*, *Asian Journal of Social Psychology*, *Small Group Research*, *Advances in Group Processes*, and *20th Century Society*.

He is the 2010 recipient of the Carol and Ed Diener Award in Social Psychology; the Society for Personality and Social Psychology's mid-career award for "outstanding contributions to the fields of personality and social psychology". His published work has attracted 45,125 citations (h-index 92, i10-index 214).

Information above found at: <http://cgu.edu/pages/3948.asp>

# Oral Presentation Schedule

| Time    | The Presenters<br>3 <sup>rd</sup> Year Department of Psychology Honours Students   |
|---------|--|
| 9:30am  | <b>Nancy Lei, Supervisor: Dr. Wendy Hoglund</b><br><i>"Does parent-child attachment mediate the association between parental discipline and child internalizing problems?"</i>                     |
| 9:45am  | <b>Lexi Brunner, Supervisor: Dr. Jennifer Passey</b><br><i>"Getting schooled on relationships: examining changes in ITRs before and after an interpersonal relationships class"</i>                |
| 10:00am | <b>Vivian Tran, Supervisor: Dr. Marcia Spetch</b><br><i>"The effect of relative rank feedback on risky decision making"</i>  |
| 10:15am | <b>Devyn Rorem, Supervisors: Dr. Wendy Hoglund</b><br><i>"Sexual orientation and peer victimization in early adolescence"</i>  |
| 10:30am | <b>Jasmine Aziz, Supervisor: Dr. Frederick Colbourne</b><br><i>"Timing of enriched rehabilitation influences treatment efficacy and hematoma clearance after intracerebral hemorrhage in rats"</i> |
|         |  |
| 1:30pm  | <b>Samantha Fu, Supervisor: Dr. Roger Dixon</b><br><i>"A longitudinal study of age and sex differences amongst four dimensions of subjective cognitive decline"</i>                                |
| 1:45pm  | <b>Taryn Buoy, Supervisor: Dr. Elena Nicoladis</b><br><i>"Reactions to codeswitching among monolinguals and bilinguals in Alberta"</i>   |
| 2:00pm  | <b>Emily Friesen-Peters, Supervisor: Dr. Jennifer Passey</b><br><i>"Teaching from the book of love: Evaluating effects of relationship education on implicit relationship theories"</i>            |
| 2:15pm  | <b>Kelly-Ann Albrecht, Supervisor: Dr. Don Kuiken</b><br><i>"Metaphoric Processes Following Awakening"</i>   |
|         |  |
| 2:45pm  | <b>Alexander Choy, Supervisor: Dr. Sheree Kwong See</b><br><i>"The effect of care recipient cognitive status on perceptions of a conflictual caregiving interaction"</i>                           |
| 3:00pm  | <b>Sarah Poirier, Supervisor: Dr. Wendy Hoglund</b><br><i>"Parent discipline and emotional regulation in early childhood"</i>  |

*continued on next page*

# Oral Presentation Schedule

3:15pm

**Michael Warren, Supervisor: Dr. Sandra Wiebe**

*"Are portion size measurement aids feasible in early childhood? Testing size estimation in preschool children"*

3:30pm

**Chris Linden, Supervisor: Dr. Peter Dixon**

*"The effect of narratorial attitude on readers' perceptions of contradictions within narrative literature"*

## Oral Presentations: Session #1

**9:30am-9:45am**

**Nancy Lei, Supervisor: Dr. Wendy Hoglund**

*Does parent-child attachment mediate the association between parental discipline and child internalizing problems?*

This study proposes a mediation model testing the association between parental discipline and prospective levels of child internalizing problems (symptoms of depression and anxiety), and whether this relationship can be mediated by parent-child attachment over two school years. The attachment theory tests the hypothesis that parental discipline contributes to the initial levels and changes in child internalizing problems over the course of pre-kindergarten and kindergarten. The attachment perspective also tests the hypothesis that parent-child attachment mediates the correlation between parental discipline and child internalizing problems. The hypothesized mediation model will be tested with a sample of 214 low-income, ethnically diverse children who have been followed over a two-year period from the fall of preschool year to the spring of kindergarten.

**9:45am-10:00am**

**Lexi Brunner, Supervisor: Dr. Jennifer Passey**

*Getting schooled on relationships: Examining changes in ITRs before and after an interpersonal relationships class*

Individuals who possess unrealistic beliefs about love and those who behave destructively in conflict with their romantic partners are at risk for dissatisfaction and even dissolution of their relationships. The current study examines how 65 students taking an interpersonal relationships course (in comparison to 65 students enrolled in another course) may experience a reduction in their maladaptive implicit theories of relationships and increase constructive styles of conflict. In particular, the current study focuses on whether the interpersonal relationships course will increase cultivation orientation (high growth and low destiny beliefs) and subsequently reduce evaluation orientation (high destiny and low growth beliefs) in romantic partnerships. Furthermore, the present study examines whether becoming more cultivation oriented mirrors changes in conflict styles, whereby these individuals will employ more compromise in conflict compared to their evaluation oriented counterparts. Implications regarding this research are multifaceted; prior research demonstrates that cultivation oriented individuals have more satisfying and long-lasting romantic partnerships compared to evaluation oriented individuals, and likewise compromise is shown to be the most adaptive conflict style. A longitudinal, correlational design (three waves of data

collection) will be used in assessing the effectiveness of integrated education on romantic relationships.

### **10:00am-10:15am**

**Vivian Tran, Supervisor: Dr. Marcia Spetch**

*The effect of relative rank feedback on risky decision making*

This study aims to determine whether feedback about how an individual is performing relative to others affects their proportion of risky choices and their overall performance score. Participants will perform an experience-based risky decision-making task on the computer. Some choices will be between options that lead to outcomes of different values, so that learning to choose the higher valued options will lead to higher scores. Other choices will be between options that have the same overall expected value but differ in risk. Participants will be told that their goal is to earn a score that is above the average of their peers. Participants will be randomly assigned to one of three feedback groups: 1) a control group which will receive no feedback, 2) an above-average feedback group which will be told their performance is above average, and 3) a below-average feedback group which will be told their performance is below average. It is hypothesized that the two feedback groups will score higher than the control group since their feedback will give them an idea about where they stand relative to their goal. It is further hypothesized that the feedback will affect risky decision making. Specifically, the below-average group is predicted to be more risk-seeking and the above-average group is predicted to be more risk-averse than the control group.

### **10:15am-10:30am**

**Devyn Rorem, Supervisor: Dr. Wendy Hoglund**

*Sexual orientation and peer victimization in early adolescence*

The proposed study examines how sexual orientation is related to changes in four subtypes of peer victimization (physical, relational, cyber, and homophobic) across two years during early adolescence. Grade and participation in the Beyond the Hurt prevention program will be assessed as moderators for these associations for sexual minority adolescents. These associations will be tested using self-report data from a sample of adolescents in grades 7, 8, and 9 in Edmonton, Alberta schools.

### **10:30am-10:45am**

**Jasmine Aziz, Supervisor: Dr. Frederick Colbourne**

*Timing of enriched rehabilitation influences treatment efficacy and hematoma clearance after intracerebral hemorrhage in rats*

Intracerebral hemorrhage (ICH) is a devastating stroke subtype characterized by vessel rupture. Since there is no established cure, rehabilitation is the gold standard of treatment, but the mechanisms of rehabilitative recovery remain poorly understood. Following the initial bleed, the hematoma breaks down into cytotoxic blood products, which contribute to chronic injury. Given that this damage occurs over days to weeks, rehabilitative timing is important for maximizing treatment efficacy. Our lab has recently found evidence that enriched rehabilitation (ER), or skilled reaching training combined with environmental enrichment, may accelerate hematoma clearance in an ICH rat model. The proposed research aims to examine how onset delay of ER influences efficacy after ICH, and whether this efficacy relates to the mechanism of hematoma clearance. Rats will be given an ICH and randomly assigned to an ER onset delay of three, seven, or 14 days, or to a control group. Motor recovery and tissue loss will be assessed up to six weeks post-ICH to determine efficacy. To evaluate the link between ER onset delay and hematoma clearance, hematoma volume will be assessed in a follow-up experiment. We anticipate earlier rehabilitation to be associated with greater efficacy and smaller hematoma volume. This project has the potential to relate rehabilitative timing to hematoma clearance, establishing a novel mechanism of rehabilitation-induced recovery specific to ICH, a connection that would inform future stroke treatment studies.

## **Oral Presentations: Session #2**

**1:30pm-1:45pm**

**Samantha Fu, Supervisor: Dr. Roger Dixon**

*A Longitudinal Study of Age and Sex Differences amongst Four Dimensions of Subjective Cognitive Decline*

Subjective cognitive decline (SCD) is the self-perception that one's cognitive abilities are declining with age, despite whether or not this can be detected with standard neuropsychometric tests. Ongoing research is being conducted to examine (1) specific dimensions of SCD and (2) their potential in predicting memory decline, impairment, and Alzheimer's disease. This longitudinal study will analyze four dimensions of SCD: participants' (1) subjective beliefs that their memory performance is declining, (2) concerns or worries about this experienced memory decline, (3) sense of self-efficacy regarding their ability to control memory decline, and (4) self-reported use of everyday memory compensation techniques. Data will be retrieved from the Victoria Longitudinal Study archives, using specific items from the Metamemory in Adulthood Questionnaire and Memory Compensation Questionnaire, as well as an objective episodic memory performance measure (word recall). Approximately 600 adults aged 55-95 years old will be included in this study over the course of three waves spanning 9 years. Differences between sex and age groups (55-74; 75-95) will be examined for each SCD dimension at baseline and over time. A

second line of investigation will follow, forming groups of high and low SCD levels for each dimension to analyze differences in memory performance between them at baseline and over time.

## **1:45pm-2:00pm**

**Taryn Buoy, Supervisor: Dr. Elena Nicoladis**

*Reactions to Codeswitching among Monolinguals and Bilinguals in Alberta*

Codeswitching is switching between two languages within a single sentence or conversation. This study will examine whether codeswitching in Alberta is perceived as courteous or impolite. Participants will be English monolinguals and French-English bilinguals. Monolinguals and half of the bilinguals will watch conversations in English; half of the bilinguals will watch conversations in French. Participants will watch videos of short conversations between two people; one person will have a word-finding difficulty, and the other will exhibit one of three responses: codeswitching, ignoring the word-finding difficulty, or using substitute words from the language already being spoken. Participants will watch one video that contains each response, for a total of three videos each. After watching each video, participants will complete a questionnaire relating to the video clip, which will include the measure of courtesy. After completing the third video questionnaire, participants will complete a personal language history questionnaire. Lastly, participants will indicate whether they thought any of the individuals in the videos spoke French. I predict that monolinguals will perceive codeswitching as less courteous than bilinguals, and that codeswitching from English to French will be perceived as less courteous than from codeswitching from French to English. This study will provide insight not only into how codeswitching is perceived, but into the purpose of codeswitching, and may provide additional evidence for a social function of codeswitching.

## **2:00pm-2:15pm**

**Emily Friesen-Peters, Supervisor: Dr. Jennifer Passey**

*Teaching from the book of love: Evaluating effects of relationship education on implicit relationship theories*

Prior research on Implicit Theories of Relationships (ITRs) has explored the importance of ITRs (destiny and growth beliefs) in interpersonal relationships, the adaptiveness of beliefs related to ITRs, and the efficacy of educational interventions in changing beliefs about relationships. However, these studies have not evaluated whether a non-interventional educational course can influence ITRs in an adaptive way. This study will compare 130 undergraduate students, half of which enrolled in a course on interpersonal relationships, to the other half who enrolled in course not focused on interpersonal relationships. I will evaluate if taking a university course on interpersonal relationships that does not have an

interventional structure correlates with an adaptive change in one's ITRs over the course of the semester. Additionally, I will evaluate if conflict tactics used in relationships correlate with certain ITRs, and if a change in the endorsement of relationship conflict tactics following participation in the interpersonal relationships course mirrors changes anticipated in ITRs. Further, I will determine whether changes in beliefs regarding ITRs and conflict tactics remain several months later. I hypothesize that taking a non-interventional course on interpersonal relationships will increase growth beliefs of ITRs (promoting a cultivation orientation). I also hypothesize that those participants whose increase in growth beliefs followed participation in the interpersonal relationships course will show a change in their endorsement levels of conflict tactics associated with growth beliefs. I will explore other relationship correlates to rule out alternative explanations.

## **2:15pm-2:30pm**

**Kelly-Ann Albrecht, Supervisor: Dr. Don Kuiken**

*Metaphoric processes following awakening*

The phenomenon of dreams affecting waking thought, termed carry over effects, presently lacks a concrete understanding. Heightened levels of creativity have been studied upon awakening. However, most dream studies have yet to investigate post-dream metaphoricity, a key characteristic of dreaming. Previous research has identified three types of impactful dreams: existential dreams, transcendent (or archetypal) dreams, and nightmares. Existential dreams have been shown to increase in frequency following a significant loss. Such dreams may boost the metaphoric quality of dreams consequently enhancing metaphoricity upon awakening. Kuiken and Porthukaran conducted an online study on associative processes upon awakening with a loss and trauma factor (in preparation). Their results indicated that existential dreams (a type of impactful dream) were followed by an interactive combination of associative fluency and associative restraint. This study will replicate their work; undergraduate students will complete Kuiken's and Porthukaran's original three association tasks (associative fluency, associative inhibition, and associative combination) as well as an additional class inclusion task to further investigate metaphoricity. We suspect that following existential dreams, participants will show a higher measure of creativity and an increased readiness to place distant metaphoric vehicles and topics in the same category.

## **Oral Presentations: Session #3**

## **2:45pm-3:00pm**

**Alexander Choy, Supervisor: Dr. Sheree Kwong See**

*The effect of care recipient cognitive status on perceptions of a conflictual caregiving interaction*

Persons with Alzheimer's disease (AD) and other dementias are at an elevated risk of experiencing mistreatment in caregiving settings. The proposed study examines the role of stereotypes about AD as a contributor to increased risk for mistreatment in care. It is possible that beliefs about physical and cognitive change in AD, beyond what is expected in normal aging may underlie suboptimal or even abusive care (i.e., "she won't remember it anyway"). Undergraduate students will view a caregiving exchange between a caregiver and a frail older care recipient in which there is conflict but motivation for the conflict is ambiguous. To examine the impact of beliefs on interpretation of the exchange, participants will be told the care recipient is cognitively alert (has diabetes) or is not cognitively alert (has AD dementia). Participants will then rate the respectfulness, nurturance, competence, and benevolence of the caregiver and the satisfaction of care received and competence of the older adult care recipient depicted in the exchange. If beliefs about AD impact perceptions of caregiving and what is acceptable in caregiving of persons with dementia, it is expected that after viewing a caregiving interaction involving conflict, ratings of the caregiver will be rated more positively when the care recipient is perceived to have dementia versus being frail without dementia (diabetes). It is also expected that the care recipient will be rated as less competent and more satisfied with the care received when participants believe that the care recipient has dementia. Understanding beliefs about aging and AD in a caregiving context can move society towards reducing the incidence of harmful stereotype-guided behaviors in caring for older adults with dementia.

**3:00pm-3:15pm**

**Sarah Poirier, Supervisor: Dr. Wendy Hoglund**

*Parent discipline and emotional regulation in early childhood*

The goals of the present study are to examine 1) how emotional regulation changes from preschool to kindergarten, 2) if parent discipline predicts levels of a child's emotional regulation across preschool to kindergarten and 3) whether the association between parent discipline and emotional regulation differ between boys and girls. The socialization and social interactional theories are used to hypothesize that higher levels and more consistent disciplinary methods will result in higher levels of emotional regulation. The sample consisted of approximately 200, ethnically diverse children aged 4-5 years old who have been followed over a span of two years beginning fall of preschool until the spring of kindergarten.

**3:15pm-3:30pm**

**Michael Warren, Supervisor: Dr. Sandra Wiebe**

*Are portion size measurement aids feasible in early childhood? Testing size estimation in preschool children*

The prevalence rate of obese and overweight children is growing and presents a substantial problem for society. Dietary management tools are commonly used with both children and adults, yet there is a lack of tools appropriate for use during early childhood. Portion size measurement aids (PSMAs) present a cheap and effective method for teaching adults proper portion sizing. However, the potential effectiveness of PSMA use during early childhood remains unknown. The proposed study will begin to address this issue by constructing a task to measure young children's ability to estimate the sizes of everyday objects, a key component of using PSMAs. Data from a parent survey will be used to determine age-appropriate stimuli for the size estimation task. The estimation task will be constructed adapted from an existing measure for adults. In the task, children will view images of common object on a touch-screen and then slide a scale to shrink or expand the image to match the true size of the object. There will be two conditions to test accuracy based on memory relative to perception: the first will be size estimation from memory alone, and the second will be size estimation while viewing the physical object. The proposed study will offer insight into an under-studied field of early childhood cognition and provide key information into the feasibility of PSMAs with preschool children.

**3:30pm-3:45pm**

**Chris Linden, Supervisor: Dr. Peter Dixon**

*The effect of narratorial attitude on readers' perceptions of contradictions within narrative literature*

Prior research has demonstrated that concepts in a narrative can be automatically reactivated when similar ideas are encountered later in the text. When the reactivated concepts are inconsistent with earlier aspects of the text, this leads to a "contradiction effect," which slows reading time for the inconsistent sentence. Alternate theories suggest that this effect is the result of rote memory processes, however the proposed research will explore the effect of the narrator's attitude on the reader's experience of the contradiction. We expect that when the narrator is skeptical about an aspect of the story, the reader will be able to use this skepticism to guide their understanding of the story, which will reduce the contradiction effect. Participants will read short narratives and reading times will be recorded for each sentence. Half of the narratives will contain contradictions between the initial and target sentences. A first-person narrator will express either a skeptical, credulous, or neutral attitude toward an aspect of the story in the initial sentence. We expect that reading times will be faster for contradictory target sentences if the narrator is skeptical toward the critical aspect of the narrative, as compared to when the narrator's attitude is credulous or neutral. These results would indicate that the reader uses the narrator as a guide to understanding the story.

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# Poster Presentations

## The Presenters

4<sup>th</sup> Year Department of Psychology Honours Students

### **Tieghan Baird, Supervisor: Dr. Sandra Wiebe**

The predictive relationship between language development and working memory

### **Caroline Bélanger, Supervisor: Dr. Cor Baerveldt**

How people with a disability create possibilities for agency in talk

### **Veronica Bergstrom, Supervisor: Dr. Jennifer Passey**

Keeping relationships afloat: An investigation of factors that correlate with implicit theories of relationships

### **Kelsy Cahill, Supervisor: Dr. Wendy Hoglund**

Economic hardship, teacher-child relations, and literacy skills in middle childhood

### **Jenna Chamberlain, Supervisor: Dr. Thomas Spalding & Dr. Christina Gagné**

The role of morphemes in word processing: The transposed letter effect in compound, monomorphemic, and pseudocompound words

### **Kate Dawson, Supervisor: Dr. Kim Noels**

Towards a conceptualization of the role of language norms in situational variations in ethnic identity

### **Kennedy Fjellner, Supervisor: Dr. Pete Hurd**

Transgenerational effects of stress on the behaviour of convict cichlids

### **Bryan Halabi, Supervisor: Dr. Wendy Hoglund**

Peer victimization and internalizing symptoms in adolescence

### **Kerry A. Howell, Supervisor: Dr. Jeff Schimel**

A unique self-threat: Self-affirmation exacerbates guilt and distress after killing

### **Emily Hussey, Supervisor, Dr. Sheree Kwong See**

Children's beliefs about older adults: Language, cognition, and personality

### **Kristen Kelly, Supervisor: Dr. Pete Hurd**

Male-biases and aggression in *Pelviachromis pulcher*

### **Isabel Light, Supervisor: Dr. Carmen Rasmussen & Dr. Jeff Bisanz**

*Adverse childhood experiences and executive functions in children with FASD and PAE*

### **Nuha Mahdi, Supervisor: Dr. Marcia Spetch**

The effect of music tempo on gambling behaviour

*continued on next page*

# Poster Presentations

**Biruk Negash, Supervisor: Dr. Clayton Dickson**

Hyperoxia enhances slow-wave states under urethane anesthesia and during natural sleep

**Vanessa Peynenburg, Supervisor: Dr. Elena Nicoladis**

Using verbal and nonverbal indices to identify autism spectrum disorder in anorexia nervosa

**Megan Pinkoski, Supervisor: Dr. Sandra Wiebe**

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

**Nicole Denise Salvador, Supervisor: Dr. Elena Nicoladis**

Catching English: Co-constructing language choice between tagalog-English bilingual siblings

**Brian Steele, Supervisor: Dr. David Rast**

Uncertainty and leader rhetoric in defining canadian identity

**Auriele Volk, Supervisor: Dr. Sandra Wiebe**

Maternal parenting and early childhood response inhibition development in the mother-child dyad

**Wesley Vuong, Supervisor: Dr. Clayton Dickson & Dr. Kyle Mathewson**

Oxygenating the brain: Examination of spontaneous EEG activity across normoxia and hyperoxia

**Jasen Zielinski, Supervisor: Dr. Michael Dawson**

Neuronal regulation and gradient descent

## **Tieghan Baird, Supervisor: Dr. Sandra Wiebe**

*The predictive relationship between language development and working memory*

There has been considerable research examining how working memory drives language acquisition. However, little research has investigated the reverse relationship, that is, whether language abilities predict working memory abilities. This study investigated the relations between early language development, current verbal ability, and working memory. We hypothesized that children who attained language milestones earlier would have better working memory performance. We also hypothesized that children with better verbal ability scores would perform better on working memory tasks. The sample included 189 children (male=91) aged 4 to 7 years. Children completed four working memory tasks: Nebraska Barnyard, Forward Word Span, Backward Word Span, and Listening Recall. Caregivers reported on age, gender and language milestones. The Woodcock Johnson III Test of Cognitive Abilities Vocabulary subtest was used to assess current verbal ability. A confirmatory factor analysis showed that all four working memory measures loaded onto a single latent factor ( $\chi^2(df=13) = 15.13, p = 0.30, CFI= 0.99, RMSEA= 0.03$ ) with factor loadings ranging from 0.71 to 0.88. A structural equation model was also completed to determine the relationship between language and working memory. Language milestones significantly predicted working memory ( $\beta = -0.10, p=0.03$ ), as did verbal ability ( $\beta = 0.37, p<0.001$ ). Better concurrent verbal abilities were correlated with reaching language milestones earlier ( $r(189)=-0.20, p=0.01$ ). These findings support our predictions that both early language development and current verbal ability have an independent relationship with working memory, which suggests that both past and present language abilities are important for working memory development.

## **Caroline Bélanger, Supervisor: Dr. Cor Baerveldt**

*How people with a disability create possibilities for agency in talk*

The literature on disability is dense, especially with regards to questions of identity; however it is relatively silent on issues pertaining to agency. This study examines how people with a disability, construct possibilities for agency in talk, specifically in their relationships with their aids and the general public. My study is informed by a Discursive Psychology (DP) perspective. DP assumes that various versions of reality are constructed in discourse and that talk is a social action that aims to orient the audience in a specific context. DP focuses on how people orient their audience and manage their stakes and interests by using various discourse practices, i.e. the ways in which people express themselves (interpretative repertoires and discourse strategies). In order to show the various discourse practices people with a disability engage in to construct possibilities for agency, I interviewed three

individuals with motor impairment (brain stem and C4 to C6 spinal cord injuries). Upon analyzing the recorded verbal data, two types of agency stand out. One arises within the intimate relationship between the person with a disability and their aid. The other type of agency arises in the impersonal relations formed in the public realm (e.g. banks, restaurants, etc.). In the public realm, the person with a disability's agency is mainly based in language, in part, due to the nature of the relationship, but also because verbal communication constitutes the vehicle par excellence ("I only have a voice") of that agency. Language is also central to the development of the relationship between the aid and the person with the disability. Participants use verbal communication as dialogical "scaffolding" to assist the aid into their constructed world. As the foundations of the relationship develop, a dialogical agency, or co-agency, progressively emerges rendering the dialogical scaffold superfluous. For some participants, this was expressed by a "letting go" of having tasks accomplished "their way" and the aid performing tasks without verbal cues from the person with the disability. The types of agency described here can be experienced in other contexts, between spouses for example, but the relationship between the aid and the person with a disability represents a paradigmatic case exemplifying these types of agency.

### **Veronica Bergstrom, Supervisor: Dr. Jennifer Passey**

*Keeping relationships afloat: An investigation of factors that correlate with implicit theories of relationships*

This study investigated familial, relationship, and media factors that may correlate with implicit theories of relationships (ITRs). ITRs are comprised of destiny and growth beliefs. Growth beliefs involve believing that relationships are malleable; they involve beliefs that relationships require maintenance, and conflicts can bring couples closer together. Conversely, destiny beliefs involve believing that relationships are rigid; they involve beliefs that relationships should be effortless, and conflicts are a sign that a relationship should end. Ninety-seven undergraduates at the University of Alberta completed a questionnaire for course credit. Results indicated that participants high in growth beliefs perceived their parents as possessing more growth beliefs, were more willing to initiate relationship discussions with their companion, were less likely to listen to music for under two hours per week, were more likely to have parents who stayed together, and were more likely to take higher-level science and math courses during high school. Participants who held more destiny beliefs perceived their parents as possessing more destiny beliefs, were more likely to seek revenge before terminating a relationship after extradyadic behaviour, and were more likely to be in relationships. These relationships between ITRs and the other factors remained when controlling for differences in attachment style, lay dispositionism, self-efficacy, and incremental vs. entity mindsets. The results of this study are important because the more we know about the factors that predict adaptive and maladaptive relationship beliefs, the more we can work towards reducing the gap between individuals' desire to be in romantic relationships and their ability to maintain them.

## **Kelsy Cahill, Supervisor: Dr. Wendy Hoglund**

*Economic hardship, teacher-child relations, and literacy skills in middle childhood*

The current study examined the associations between family economic hardship, teacher-child relations, and literacy skills during middle childhood. Specifically, we examined growth in children's literacy skills over two school years and assessed whether family economic hardship and teacher-child relationship quality predicted growth in literacy skills, and whether family economic hardship moderated the association between teacher-child relationship quality and literacy skills. Data were collected on six occasions over two school years with a large sample of low-income, ethnically diverse children in kindergarten to grade 3 (N = 506). Data were analyzed using latent growth curve models. Our findings indicated that there was a positive association between teacher-child relationship quality and literacy skills at baseline and change in these constructs across the two years for children in more economically disadvantaged families. These associations were not significant for children in families who experienced less economic hardship. Our findings suggest that higher quality teacher-child relationships act as a buffer for the literacy skills of children in economically disadvantaged families.

## **Jenna Chamberlain, Supervisor: Dr. Thomas Spalding & Dr. Christina Gagné**

*The role of morphemes in word processing: The transposed letter effect in compound, monomorphemic, and pseudocompound words*

It is well established that morphologically complex words are decomposed into morphemes during processing. However, it is unknown whether a similar process happens for pseudocompounds (e.g., carpet), where the morphemes are embedded and the meaning of the embedded morphemes does not relate to the meaning of the whole word. To explore this question, we conducted four experiments using an error detection task, in which participants were asked to determine if words have a spelling error. Using this task we compared the processing of monomorphemic words (e.g., tomato), transparent compound words (e.g., snowball) and pseudocompound words (e.g., carpet). In the compound and pseudocompound words, spelling errors were created by transposing adjacent letters at the morpheme (or embedded-morpheme) boundary and, in monomorphemic words, errors were created by transposing letters at the same location as matched compound or pseudocompound words. The response time and number of correct responses were analyzed. We found that pseudocompounds were not as fast as compounds when there was no error. We also found that pseudocompounds were slower than monomorphemic words when there was an error. That the responses to pseudocompounds were different than the responses to both compound and monomorphemic words suggests that the embedded morphemes in pseudocompounds are accessed during word processing.

## **Kate Dawson, Supervisor: Dr. Kimberly Noels**

*Towards a conceptualization of the role of language norms in situational variations in ethnic identity*

Situational perspectives on acculturation emphasize that ethnic identities shift depending on where, why and with whom one interacts. Clément, Noels, and Deneault (2001) argued that such variations are linked to communication processes, including norms regarding appropriate language use. To date little research has articulated situational norms for language use in bilingual/bicultural persons. Accordingly, 243 people from immigrant families who spoke at least one native language other than English, completed a survey assessing their heritage and Canadian ethnic identity across four situational domains (i.e., family, friends, university, community); their perceptions of normative pressure to use the heritage language and English across the same domains; as well as language use in each domain. Consistent with previous research, the results showed that heritage identity was stronger than Canadian identity in relatively private domains, but the reverse was true in more public domains. Language norms followed a similar pattern. Regression analyses examined the relative importance of language norms and use for variations in ethnic identity. The results have implications for understanding the dynamics of normative language use and acculturative changes to the ethnic identity of bicultural people living in Canada.

## **Kennedy Fjellner, Supervisor: Dr. Pete Hurd**

*Transgenerational effects of stress on the behaviour of convict cichlids*

Stressful experiences, especially during early life, may have a detrimental effect on development, though recent research has suggested that moderate developmental stress exposure may provide increased resilience later in life. In the present study, convict cichlid fish (*Amatitlania nigrofasciata*) were used to investigate the effects of transgenerational and juvenile stress exposure on adult stress coping styles. A group of parent fish were exposed to a stressful daily net-chasing treatment for two weeks in the moderate stress exposure group and two months in the prolonged stress exposure group while a control group was not exposed to a stress treatment. After maturation, the fish were bred with others from the same cohort and the subsequent offspring of these fish were separated into either a control or moderate stress group. The moderate stress group was subjected to the net-chasing treatment for two weeks starting one day after they became free-swimming fry. The fish were assessed for behavioural performance in boldness, plus maze, and open field apparatuses to examine resilience in relation to the degree of exposure to early life stress. The present study aims to determine if varying levels of early life stress affect the allostatic load in convict cichlids and alter resilience by creating the ideal amount of stress exposure to produce proactive coping styles in novel environments and predator avoidance. Proactive coping styles would include more ambulatory and explorative

behaviours, whereas reactive coping styles would result in freezing or hiding behaviour. Fish that experience moderate levels of stress during development should exhibit proactive coping styles during adulthood.

**Bryan Halabi, Supervisor: Dr. Wendy Hoglund**

*Peer victimization and internalizing symptoms in adolescence*

The current study examined the associations between four subtypes of peer victimization (relational, physical, ethnic, and cyber) and internalizing symptoms (depression and anxiety) during adolescence. Gender, racial/ethnic, and age-related differences in these associations were examined. Data were collected in the fall and spring of one school year with a large sample of ethnically diverse adolescents in grades 7 to 9 (N = 1,427) in 8 junior high schools. Our findings indicated that youth who experienced more internalizing symptoms at the start of the school year were more likely to be victimized by peers by the end of the school year. This was true for all peer victimization subtypes. Further, girls experienced more relational and cyber victimization, while boys experienced more ethnic and physical victimization at both the start and end of the school year.

**Kerry A. Howell, Supervisor: Dr. Jeff Schimel**

*A unique self-threat: Self-affirmation exacerbates guilt and distress after killing*

Recent research has shown that self-affirmation reduces defensive reactions to self-threats, presumably because the act of affirming the self functions to restore or maintain the overall integrity of the self. The current study assesses the effect of self-affirmation on a unique type of self-threat: killing. If self-affirmation bolsters one's perception of the self as moral and good, then doing so prior to killing may exacerbate the threat of killing and the resulting negative emotions such as guilt and shame. This hypothesis was tested using a recently developed bug-killing paradigm. Self-affirmation was manipulated between-subjects, with participants randomly assigned to a self-affirming writing task or a parallel control task. Participants then completed a bug-extermination task, which lead them to believe they systematically killed a set number of bugs. Subsequently, levels of guilt and shame were measured using questionnaires and a behavioral hand-washing measure. Results showed that participants who self-affirmed experienced more guilt and shame than those who were not affirmed. These results have implications for the conditions that foster or dampen guilt in soldiers who have killed at war, which could affect their risk for developing post-traumatic stress disorder.

**Emily Hussey, Supervisor: Dr. Sheree Kwong See**

*Children's beliefs about older adults: Language, cognition, and personality*

Old age stereotyping and behavior in line with age stereotyping (ageism) have been extensively demonstrated in younger adults. However, few studies have examined children's beliefs about and behaviours directed toward older adults. Past research suggests that children as young as 3 age stereotype and have negative attitudes towards older adults and aging, and these attitudes are well-defined by the age of 8 (Gilbert & Ricketts, 2008; Isaacs & Bearison, 1986). In the current study, children aged 7-10 ( $n=11$ ,  $M=8.73$ , 54.5% male) completed a block building task with either a younger (female in her 20s) or an older (female in her 70s) confederate. On average, based on parent reported contact with seniors, these children had positive interactions with seniors in their lives and these interactions are mostly with a grandparent(s). To examine age stereotyping about language, children completed a modified version of the Language in Adulthood Questionnaire (Ryan, Kwong See, Meneer & Trovato, 1992). In counterbalanced order, children indicated the extent to which younger and older adults would experience receptive (e.g., losing track of what is being said during a conversation) or expressive (e.g., trouble keeping facts straight when telling a story) language problems in conversation. Children also answered questions about cognition (e.g., wise, easily confused, forgetful, slow), and personality (e.g., friendly, kind). As measures of ageism, the distance that children sat from either the younger or the older confederate and how long they talked with the confederate during the block building task was recorded. We found that, relative to younger adults, children believed that older adults experience more receptive but not expressive problems in communication. Children also believed that older adults are wiser, friendlier, and kinder, but are also easily confused and slower. No differences were found across confederate condition in the distance the child sat or how long they spoke to confederates. This study provides support for previous research demonstrating that children do have stereotypes about older adults, which has implications for understanding the development of age stereotypes and ageism.

**Kristen Kelly, Supervisor: Dr. Pete Hurd**

*Male-biases and aggression in **Pelviachromis pulcher***

According to the Trivers-Willard hypothesis, changing environmental conditions can cause a species to alter their sex ratio in order to promote reproductive success. One species that has been shown to be particularly sensitive to environmentally influenced sex differentiation is the African cichlid fish, *Pelvicachromis pulcher*. Previous research has shown the effect of abnormal environmental temperature on sex determination in *P. pulcher*. Typically, a higher temperature results in a more male-biased sex ratio, whereas, a lower temperature promotes female differentiation. This altered sex ratio may also influence morphology, physiology and behaviour. Though sexual differentiation induced by environmental modifications has been well examined in *P. pulcher*, little is known about the behavioural characteristics associated with an altered sex ratio, particularly changes in behaviour, such as aggression. The proposed study will focus on how environmental sex determination can

influence social behaviour within a sex in P. pulcher. We shall investigate aggression, and other social behaviours and their neural basis as a function of how our manipulations “masculate” them.

**Isabel Light, Supervisor: Dr. Carmen Rasmussen & Dr. Jeff Bisanz**

*Adverse childhood experiences and executive functions in children with FASD and PAE*

Individuals with Fetal Alcohol Spectrum Disorder (FASD) often face a “double- jeopardy” with both organic deficits in neurological functioning and high rates of adversity in childhood. In non-clinical populations adverse childhood experiences such as neglect and abuse are related to deficits in executive functioning (DePrince et al., 2009; Spann et al., 2012; Viola, Tractenberg, Pezzi, Kristensen, & Crassi-Oliveira, 2013). This study is the first to examine the relation the frequency of adverse childhood experiences as measured by the Adverse Childhood Experiences questionnaire (ACE) in children with PAE/FASD and to further examine the relation between ACE scores and executive functioning. Childhood adversity was measured by scoring the Adverse Childhood Experience Questionnaire (ACE) retrospectively on clinical files. Children in the study had experienced a high rate of adverse childhood experiences as measured by the ACE. The amount of childhood adversity experienced as measured by the ACE was not related to performance on measures of EF in children with PAE or FASD.

**Nuha Mahdi, Supervisor: Dr. Marcia Spetch**

*The effect of music tempo on gambling behaviour*

In this study, we examined the influence of background-music tempo on gambling behavior. We compared risk preferences in participants who completed a risky choice task while listening to either fast music, slow music, or no music. The risky choice task included two decision formats (described or experience-based) and two outcome valences (gains and losses). For described decisions, participants were provided the probabilities of each outcome when making choices, whereas for experience-based decisions, participants chose between doors presented on a computer screen and learned the probabilities through experiencing the outcomes of their choices. In both formats, participants chose between risky options that probabilistically led to different outcomes or a safe option that had a guaranteed outcome. Our results replicated the choice type and outcome valence interaction seen in previous studies: participants gambled more for losses than for gains in described choices but showed the opposite effect in experience-based choices. However, there were no significant effects of music tempo on either gambling behaviour or reaction time.

## **Biruk Negash, Supervisor: Dr. Clayton Dickson**

*Hyperoxia enhances slow-wave states under urethane anesthesia and during natural sleep*

Oxygen (O<sub>2</sub>) is a crucial element for physiological functioning in mammals. In particular, the appropriate functioning of the brain is critically dependent upon a minimum amount of circulating blood levels of O<sub>2</sub> and immediate and lasting dysfunction can occur following hypoxic episodes. Although hypoxia and its effects are well studied, less is known about the influence of elevated levels of O<sub>2</sub> (hyperoxia) on the brain under typical ranges of atmospheric pressure. Using field (EEG) recordings in spontaneously breathing urethane-anaesthetized and naturally sleeping rats, we sought to characterize the influence of different levels of O<sub>2</sub> in inspired air. Under urethane anesthesia in which spontaneous alternations of brain state were present, administration of 100% O<sub>2</sub> elicited a significant and reversible increase in time spent in the deactivated (i.e. slow-wave) state, with concomitant decreases in both heart and respiration rates. Blood gas analysis across experiments showed a concomitant increase in oxygen saturation, and also increased partial pressures of both O<sub>2</sub> and CO<sub>2</sub>. In contrast, administration of 5% CO<sub>2</sub> in air produced a decrease in the time spent in deactivated state, suggesting that it is the relative concentrations O<sub>2</sub> that mediates brain-state effects. In support of this, by mixing either O<sub>2</sub> or N<sub>2</sub> in normal air, we found graded effects on forebrain EEG with elevated O<sub>2</sub> promoting a deactivated state and diminished O<sub>2</sub> promoting the activated state. During natural sleep, hyperoxia similarly promoted the proportion of time spent during slow-wave (nonREM) states. Thus, alterations of O<sub>2</sub> appear to directly affect forebrain EEG states, a finding that has implications for brain function, as well as for the regulation of brain states and levels of forebrain arousal during sleep in both normal and pathological conditions.

## **Vanessa Peynenburg, Supervisor: Dr. Elena Nicoladis**

*Using verbal and nonverbal indices to identify autism spectrum disorder in anorexia nervosa*

Recent research has found similarities in the cognitive, social, and emotional profiles of individuals with Anorexia Nervosa (AN) and Autism Spectrum Disorder (ASD). Estimates of the prevalence of ASD in AN are usually in the range of 20 to 25%, but these estimates are problematized by the use of measures typically utilized for male participants. This study used a novel method to investigate the more subtle verbal and nonverbal indices of ASD. Video blogs from individuals with AN were transcribed and coded for speech rate, sentence length, references to food and calories, gesture frequency, and gesture synchrony. Compared to controls with bulimia nervosa (BN), it was hypothesized that participants with AN would have a slower speech rate, longer sentences, more references to food and calories, less frequent gestures, and more asynchronous gestures. Overall, there was support for the hypothesis that individuals with AN have more linguistic indices of ASD, as they had longer sentences and more asynchronous gestures. Unexpected results, such as

insignificant differences in speech rate between groups, and less frequent gestures in BN, are explained by a possible confounding variable of depression in BN. Implications for social and treatment settings are explored, including the possibility of social skills training in populations with AN.

### **Megan Pinkoski, Supervisor: Dr. Sandra Wiebe**

*Parent-child shared book reading and the development of children's executive function*

Parental behaviour and activities have been shown to affect children's development of executive function. This study examines the relationship between quantity and quality of parent-child book reading and children's executive function (EF) development. The participants included 11 children aged 36-43 months old. Parents and children completed a book reading interaction in the lab, which was video-recorded and coded offline for engaging reading behaviours/parental scaffolding behaviours and parental warmth and sensitivity. Children completed a short EF battery measuring working memory, inhibition, and delay of gratification. Parents also completed a questionnaire reporting on their shared book reading experiences with their children, family background information, and an indirect measure of children's exposure to books, and children completed a standardized vocabulary test. Correlations were used to examine the relationship between parent-child book reading measures, EF measures, and child vocabulary. Quantity and quality of shared book were not significantly correlated with children's executive function scores. This may be because there was little variability in parents' reading, perhaps because of the sample make-up, which was composed of a higher socio-economic status background. Future research should examine this relationship with a larger and more diverse sample.

### **Nicole Denise Salvador, Supervisor: Dr. Elena Nicoladis**

*Catching English: Co-constructing language choice between tagalog-English bilingual siblings*

In a multicultural setting like Canada, preserving the heritage language (HL) is an issue for some immigrant families. Although many immigrant parents report that they want their children to speak the HL, they do not necessarily speak that language consistently at home (Nagpal & Nicoladis, 2010). Older siblings, too, may start speaking the HL less after school transition (Bridges & Hoff, 2014). As a consequence, later-born children of immigrants often become passive bilinguals. This study looked at the language choice among Tagalog-English bilingual siblings living in an English-majority community in Canada. Sibling pairs, drawn from three age groups (i.e. both preschool-aged, one preschool and one school-aged, both school-aged), were videotaped while they talk about six different scenarios: half of which were deemed as Tagalog-oriented (e.g. grandparents), and the other half, English-oriented (e.g. school). After measuring the percent English-only utterances of these sibling pairs, we found that children in all three age groups spoke primarily English

regardless of context. These results suggest that the children are sensitive to the majority language even before starting school. Immigrant parents who would like their children to maintain their HL must start promoting that language early and consistently.

### **Brian Steele, Supervisor: Dr. David Rast**

*Uncertainty and leader rhetoric in defining Canadian identity*

In times of uncertainty, individuals look to strong leaders who provide clear and unambiguous visions for their group. Leaders serve a social-identity function, and can employ rhetoric to reinforce, change, or modify group identity (Rast, Van Knippenberg, Hogg, & Crisp, 2012). Previous work shows that uncertain individuals favor leaders who use concrete language (“as x, we are y”) rather than abstract language (“as x, we are not y”) to define the group. The present study examines whether this effect persists in rhetoric defining a group’s relationship with minority group members and how subtle changes in rhetoric negatively affect intergroup attitudes.

200 Canadian-born undergraduates first complete an implicit association test (IAT) to assess the potential moderation of associating Aboriginals as “foreign” or “Canadian”. After being instilled with differing levels of uncertainty, participants read a speech from an anonymous Canadian politician (with either concrete or abstract language) and rate their trust, support, and perceived prototypicality of the leader. They also complete measures of self-uncertainty, rate political issues relating to minority treatment, and complete demographics measures.

The potential results are discussed in relation to the social identity theory of leadership and uncertainty-identity theory, examining how rhetoric impacts leader support under uncertainty.

### **Auriele Volk, Supervisor: Dr. Sandra Wiebe**

*Maternal parenting and early childhood response inhibition development in the mother-child dyad*

The present study investigated the relationship between maternal parenting behaviour (responsive involvement, constructive discipline, and problematic discipline) and 3-year-old child response inhibition. The explanatory variables were the 3 domains of maternal parenting behaviour and the response variable was child performance on a Go/No Go (GNG) task. It was predicted that greater maternal responsiveness, greater constructive discipline, and less problematic discipline behaviours would predict child GNG performance. Interestingly, a stepwise regression analysis resulted in a greater constructive discipline, less problematic discipline, and child sex predicting child GNG performance. Male child participants had better GNG performance as compared to female participants. Contrary to previous findings, maternal responsive involvement did not predict child response inhibition in early childhood. Limitations include complexity of the maternal coding

measure, applicability of the maternal coding measure in professional settings, and use of one task to measure response inhibition in early childhood. The results of this study can be used to further the development of intervention programs, as well as further knowledge on the predictability of the childhood outcomes from the maternal-child dyad.

### **Wesley Young, Supervisor: Dr. Clayton Dickson & Dr. Kyle Mathewson**

*Oxygenating the brain: Examination of spontaneous EEG activity across normoxia and hyperoxia*

Recreational uses of oxygen bars have increased over the past decade. Oxygen bar providers claim that recreational uses of oxygen can help reduce fatigue, increase alertness, and improve attentional capacities. Our lab has recently demonstrated that hyperoxia can promote deactivated (slow-wave) states of brain activity in both anaesthetized and naturally sleeping rats. However, very few studies have evaluated these benefits relating to attention in human subjects. Currently, we are studying the hyperoxic effects on resting states in awake human subjects by examining spontaneous EEG activity across normoxic and hyperoxic situations within-subjects for both eyes open and eyes closed conditions. We also measured respiration rate, heart rate, and blood oxygen saturation levels (SpO<sub>2</sub>). Based on past research, we hypothesized that increased levels of oxygen in the blood will decrease the amount of alpha power during hyperoxia in both eyes open and closed conditions. However, we observed no significant changes in alpha power with increased levels of blood oxygen caused by hyperoxic inhalation. Surprisingly, we found a reliable, frontal decrease in beta under hyperoxia during eyes open conditions. Our results suggest that oxygen administration modulates brain activity, at least with oscillatory processes. As increased beta activity is associated with states of alertness, concentration, and focus, our results find no evidence to support the claims of recreational oxygen providers.

### **Jasen Zielinski, Supervisor: Dr. Michael Dawson**

*Neuronal regulation and gradient descent*

This study proposes a learning rule for feedforward artificial neural networks that combines neuronal regulation and gradient descent. Learning multiple problems through gradient descent is often difficult due to catastrophic interference, i.e. forgetting a prior problem due to modifying relevant weights in the network when learning a subsequent problem. Neuronal regulation creates sparse, distributed representations in autoassociative networks by degrading weak weights and strengthening others. Neuronal regulation has never before been studied in network architectures based on gradient descent. To see whether combining neuronal regulation and gradient descent affects catastrophic interference, a combined learning rule is developed and examined on catastrophic interference problems. Neuronal regulation decreases the amount of catastrophic interference but the

frequency of network responses reaching a global error minimum also decreases. Neuronal regulation also increases the sparsity of representations in the network and moves the network's responses up the error gradient. Although these latter properties of neuronal regulation are potentially useful, the decreased rate at which networks reach a global error minimum makes neuronal regulation a poor solution for the problem of catastrophic interference.

# Conference Map

