



Inquiry@Queen's

11th

Annual

Undergraduate

Research Conference

Program

March 9 & 10, 2017
Queen's Learning Commons
Stauffer Library

queensu.ca/iatq

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March 2017

We are now in our 11th year of celebrating the discoveries of a new generation of scholars at the Annual Inquiry@Queen's Undergraduate Research Conference. We have two full days to share, discuss, think, learn and feel excited about the research of our undergraduate students. The work they will present comes from many avenues - course work, theses, design projects, and summer research opportunities; some came simply from an interest in a topic, and a desire to know more and think more. For the first time this year we are excited to have student researchers from outside Queen's - from University of Guelph, University of Toronto, Carleton University, and Bridgewater State University (New York).

Inquiry@Queen's is more than a conference; it is an approach to learning where the teacher and the learner reside in the same person. It is a natural extension of a university that prides itself on the quality of undergraduate education and its scholarship and research.

We invite you to attend the oral presentations, to view the posters and talk to the presenters, to ask questions, to attend the opening ceremonies and the special events, but most certainly to enjoy the breadth of undergraduate student scholarship. Drop by for an hour, an afternoon, a day or two days! To all those who have supported us in many ways over the last eleven years...we thank you! Congratulations to all participants! On behalf of Inquiry@Queen's,

Vicki Remenda
Associate Dean (Acting) (Teaching and Learning)
Faculty of Arts and Science

Jackie Druery
Head Humanities & Social Sciences Librarian
University Library

Nathalie Soini
Head, Information Services Division
University Library

Patrick Patterson
Reference Assistant
William Lederman Law Library

CONFERENCE AGENDA

Thursday, March 9, 2017

- 9:00-9:15 Coffee (Speaker's Corner, Stauffer Library)
- 9:15 Session I: Identity, Othering, and Gender (Speaker's Corner)
- 9:30 Session II: Competition and Collaboration (Seminar Room, Stauffer Library)
- 11:30 Keynote: (Speaker's Corner)
- 1:00 Session III: Reimagining & Innovation 1 (Speaker's Corner)
- 1:00 Session IV: Patient Care 1 (Seminar Room)
- 3:15 Session V: 5, 6, 7, 8 (Speaker's Corner)
- 3:15 Session VI: Stimuli (Seminar Room)

Friday, March 10, 2017

- 9:00 Session VII: Community & Identity (Speaker' Corner)
- 10:30 3 Minute Thesis (Speaker's Corner)
- 11:30-1:00 Session VIII: Lunch with Poster Presenters (Seminar Room) All Welcome!
- 1:30 Session IX: Curios (Union Gallery, Stauffer Library)
- 1:00 Session X: Reimagining & Innovation 2 (Speaker's Corner)
- 1:30 Session XI: Patient Care 2 (Seminar Room)

ORAL PRESENTATIONS

Session I: Identity, Othering & Gender

Speaker's Corner

Thursday, March 9, 9:15-11:15

Moderator: Dr. Brian Payne, Bridgewater State University

Forge a strong, Independent Nation! : The Role of the Discourse of Autonomy in Creating Internal Repression in North and South Korea from 1945 to 1979

Presenter: Ann Choi

Faculty Supporter: Dr. Konrad Lawson, School of History, University of St. Andrews

This paper compares how the North and South Korean government from 1945 to 1979 used a rhetoric that emphasized individuals' autonomy and unity with their nations to create internal repression. This rhetoric, which the paper terms as "the discourse of autonomy", emerged during the Japanese Occupation when politicians posited Korean identity as a unique and homogenous entity. By analyzing the speeches, autobiographies, as well as economic and educational policies published by the North Korean president Kim Il Sung and South Korean president Park Chung Hee, this paper illustrates how self-strengthening movements in agricultural and educational sectors punished individuals who failed to conform to societal standards. Because of the division between two nations, the discourse of autonomy further repressed members of South and North Korean societies whose occupations bore association to their enemy nation.

Hell Hound Rogers or The Great Town Benefactor: Who Was Henry Huttleston Rogers?

Presenter: David Braga, History/Bridgewater State University

Faculty Supporter: Dr. Paul Rubinson

The Gilded Age was a period in American History from the end of the Civil War lasting until around 1900, known for big business ruling the country. Henry Huttleston Rogers was a prominent figure in the Gilded Age but has seldom been talked about because other figures of the period such as John D Rockefeller have overshadowed him. Rogers was the Vice President of Standard Oil, the most powerful trust in United States history. The lack of scholarship on Rogers and his historical significance created the need for him to be researched. Rogers' business dealings helped lead to comprehensive legislation that regulated business, particularly President Theodore Roosevelt's square deal. This research project sought to investigate who Henry Huttleston Rogers was and his role in the Gilded Age.

Sources on Rogers either portray him in a positive light and talk about him as The Great Town Benefactor of his native town, Fairhaven, Ma or as a robber baron who cared solely about his own wealth. Primary sources on Rogers include first hand accounts published in book form by Thomas Lawson, letters between Rogers and Mark Twain, which were published, political cartoons and archival research materials that included personal correspondence, newspapers, and building deeds. Secondary sources include a biography on Rogers and various sources published by local writers from the town of Fairhaven. With all of this taken into consideration it became evident that there was a dual personality to Rogers but that he cared about his wealth more than anything else.

Downtrodden Peoples or Illegal Migrants?

The Role of Parliamentary Speeches in Perceptions for Refugees to Canada

Presenter: Carling Counter, Political Studies

Faculty Supporter: Dr. Jessica Merolli

The Syrian Refugee Crisis weighs heavily on the minds and shoulders of Canadian politicians. This project explored how the victims of this crisis and other refugees are discussed in Parliament. Parliamentary speeches were collected and coded to see what themes run through these discourses and whether they change based on time or party affiliation. It was found that humanitarian concerns were a thread through all parties, but these concerns came in at different times depending on party. Additionally, there were some concerns that were more prevalent in other parties in the refugee discourse, such as terrorism in the Conservative party, nationalism and the Liberal party, and deservingness and the NDP.

Unity or Identity? European Disintegration and WWI Culture Conflict

Presenter: Conor Hannigan, Political Studies

Faculty Supporter: David Haglund

A resurgence of nationalism in Europe risks undermining the European integration project. Social Psychology and International Relations (IR) literature have explored how identities are created and strengthened through a process called 'othering' in which groups define themselves in opposition to others. Several variables contributing to this resurgence of nationalism exist, but 'othering' as a means of strengthening group identity appears to be among the most salient factors. This paper draws on previous academic research and uses a historical case study to argue that 'othering' in times of trouble and insecurity is not a new phenomenon. My research has focused on the changing public opinion among American citizens of English, German, and Irish descent during World War I. The methodology for this research required surveying primary and secondary sources published during the period August 1914 – April 1917 in order to glean evidence of changing public opinion of specifically the English diaspora. Throughout this process, it became apparent that a resurfacing of cultural and civilizational identities among the diasporas were often the source of changing opinion. Moreover, attempts by Irish and German-Americans to discredit English civilization and the Entente cause during the war actually served to strengthen Anglo-American ties and identities. This case study illustrates how the process of 'othering' may be used to bolster a sense of group identity in times of insecurity. This is something that appears to be occurring in Europe and has begun a process of European disintegration.

Examining the Connection between Exposure to People with Physical Disabilities and Staring Behaviour among Able-bodied Adults

Presenter: Shannon Weissman, Kinesiology and Health Studies

Faculty Supporter: Dr. Amy Latimier-Cheung

Previous work suggests that interacting with people with disabilities is an effective strategy for improving attitudes and behaviours towards this stigmatized group. However, the optimal context for such interactions is unknown. Studies have found that portraying an individual with a disability as physically active may improve how able-bodied individuals perceive him/her. This study applies the stereotype content model to evaluate whether experience interacting with people with physical disabilities in a physical activity setting is a more effective strategy for mitigating negative behavioural reactions (staring) towards this population than interaction in a non-physical activity setting, or no interaction at all. The study uses eye tracking to evaluate staring behaviours in response to four image types: disabled/active, disabled/inactive, able-bodied/active, and able-bodied/inactive. Thus, this

research will also examine interaction effects between experience level and image type. This study will provide evidence as to whether interacting with individuals with physical disability in a physical activity setting should be targeted as a real-world intervention for improving the way in which people with physical disabilities are treated.

The Juvenile Justice Programs: An Institutional Ethnography Study of the Rules and Procedures Crisis in Contemporary Korean Court System

Presenter: Angela Won, Sociology

Faculty Supporter: Prof. Scott Thompson

From the standpoint of everyday experience, this paper reveals how the rules and procedures used within the Criminal Justice System in Korea to assess juvenile crime disproportionately favors higher income individuals. Specifically, it identifies the importance of how people are represented and classified within the criminal justice system in the application of restorative justice programming. Drawing on a methodology of Institutional Ethnography, texts related to the implementation of restorative justice within the Korean Criminal Justice System were reviewed, and interviews were conducted with key individual(s) charged with implementing restorative justice practices. Findings from this research show a clash between the Korean cultural ethics of "jeong," which stresses the need for restoration and peace in the face of all criminal actions, and the selective application of restorative justice in the modern Korean context. In particular, the rules and procedures used in the classification of juvenile offenders limits what types of individuals and communities are allowed to benefit from these programs. This is problematic, as delinquents receiving the benefit of restorative justice programming will only be limited to those classified as being 'compatible' with existing programming under the Criminal Justice System's rules and procedures, significantly disadvantaging lower income juveniles.

Session II: Competition & Collaboration

Seminar Room

Thursday, March 9, 9:30-11:30

Moderator: Lauren Turner, Civil Engineering

Conflict Intensity in African Water Basins: Water Stress and the Effectiveness of Water Management Strategies

Presenter: Sarah Boyce, Political Studies

Faculty Supporter: Dr. J. Andrew Grant

Access to cross-border water sources in the African regions of the Nile River, Zambezi River, and Lake Turkana Basins becomes less certain as global population, human consumption, and climate change increase. Uncertainty during periods of high demand for water in agro-dependent economies creates circumstances of water stress, where social stability is low as stakeholders compete over scarce water sources. Longstanding traditions of political power, such as colonial rule and the status of regional superpowers, reinforce the unequal resource distribution. All three regions encounter water stress in the form of floods or droughts. They rely on dam projects that modify water distribution and basin agreements that reallocate political power to manage stress. The basins vary, however, in conflict intensity and effectiveness of water management strategies. The Nile River Basin exhibits low-intensity conflict and has institutionalized collaborative management strategies; the Zambezi River Basin demonstrates medium-intensity conflict with theoretically collaborative initiatives that fall short in practice; the Lake Turkana Basin exemplifies high-intensity conflict, lacking collaborative agreements. In order to address the discrepancy in outcomes, this study asks: what factors contribute to the intensity of conflict surrounding water stress? And, to what extent are water management practices effective in

promoting cooperation and preventing conflict? The study concludes that the most intense conflicts occur in rural localities, where social instability is high and resource distribution is uneven. Collaborative agreements and international involvement in water management initiatives increase social stability and decrease conflict intensity by institutionalizing equitable distribution of water in a changing environment.

Intrasexual Competition and Sexual Response in Androphilic Women

Presenter: Margaret Cornett, Psychology

Faculty Supporter: Dr. Meredith Chivers

Androphilic (sexually attracted to men) women demonstrate genital and self-reported arousal to sexual stimuli of both their preferred and non-preferred genders - a "gender-nonspecific" sexual response (e.g., Chivers et al, 2007). One hypothesis for female non-specific arousal patterns is intrasexual competition (the rivalry among the same sex for mates). Previously intrasexual competition has been operationalized as the level of jealousy a woman feels towards another woman. Intrasexual competition has been found to increase attentional adhesion to same sex stimuli (Maner, Gilliot & Roudy, 2007) The Information Processing Model (IPM; Janssen et al, 2000) posits that visual attention to sexual cues may result in a sexual response. Longer viewing times to same sex stimuli motivated by intrasexual competition (Maner et al., 2007) could therefore lead to an increase in self-reported arousal to non-preferred stimuli. This study explores the relationship between traits associated with intrasexual competition and sexual responding (visual attention and self-reported sexual arousal).

Androphilic women are exposed to sexual stimuli varying by gender (preferred, non-preferred) and physical attractiveness level (attractive, unattractive). Visual attention is measured using an eye tracker and sexual arousal is assessed by participant self-report. Intrasexual competition is operationalized through measures of self-reported jealousy, anger, indirect aggression, and body image. I predict the participants will exhibit greater intrasexual competition after viewing images of attractive women compared to images of unattractive women and men. I also explore visual attention as a mediator between intrasexual competition and self-reported sexual arousal. Data collection for this project is currently underway.

Chivers, M. L., Seto, M. C., & Blanchard, R. (2007). Gender and sexual orientation differences in sexual response to sexual activities versus gender of actors in sexual films. *Journal of personality and social psychology*, 93(6), 1108. <http://dx.doi.org/10.1037/0022-3514.93.6.1108>

Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research*, 37(1), 8–23. <https://doi.org/10.1080/00224490009552016>

Maner, J. K., Gailliot, M. T., Roudy, A., & Miller, S. (2007). Can't Take My Eyes Off You: Attentional Adhesion to Mates and Rivals. *Journal of Personality and Social Psychology*, 93(3), 389–401. <https://doi.org/http://dx.doi.org/10.1037/0022-3514.93.3.389>

Comparing Golf Eras

Presenter: Patrick Gravelle, Mathematics and Statistics

Faculty Supporter: Dr. Andrew P. Dean, VP of Research and Innovation, Lakehead University

Competition can be found in a schoolyard baseball game, a retirement home shuffleboard match, an NBA championship final, and anywhere in between. It is through this competition that the motivation to best one's opponent is found, and underlying that motivation, is the desire to be the greatest. However, in sports, this theme of greatness does not simply extend to just one match, or a single season, but rather, it reaches throughout all of time. For a sport such as golf, like many others, the debate of determining the greatest player of all time appears hopelessly divided. With the tools of data mining and analysis, this paper aims to close that division by using the categories most prestigious to the golfing elite, in order to rank golf's best. Moreover, it provides future achievements that two current golfers must attain to ascend to the top of the all-time rankings.

The Grey and Hazy Politics of Famine: An Evolving American Disposition to Russian Hunger

Presenter: Kelley Humber, History and Political Studies

Faculty Supporter: Dr. Rebecca Manley

Perception of famine in the 20th century transformed from a Malthusian reality to a governmental liability. In this period of developmental flux, assistance to the starving in the form of humanitarian aid took on a new political role on the international stage. As part of an Undergraduate Summer Student Research Fellowship (USSRF) my research broadly examined the political utility of humanitarian aid between the United States and the Soviet Union during this period. This research project was centrally concerned with tracing the conceptual evolution of the 'hungry Russian' in American society. My research looked specifically at incidences of famine in the Soviet Union from 1921-1922, 1932-1933, 1946-1947, and American perceptions thereof. In order to understand the central question of this research project I combined secondary source reading with primary source archival research. I draw on archival material in the form of newsprint from the New York Times during the respective famines. I traced the frequency of discussion of Russian famine and compared this to the relative scale of famine devastation in the form of human deaths. Ultimately this process allows for conclusions to be drawn on the role of political interests in the humanitarian endeavor of providing relief during these famines. This research has both theoretical implications for understanding the conceptual shift surrounding humanitarian aid that occurred during this time period; as well as practical implications for critically-minded citizens who are interested in the historical weight behind state-sponsored humanitarian aid.

Examining the Relationship between Initial Cardiometabolic Stress during Exercise and the Adaptive Response to Endurance Training

Presenters: Camille Leblanc and Matthew Nelms, Kinesiology and Health Studies

Faculty Supporter: Dr. Brendon Gurd

Introduction: It has been demonstrated that there is substantial individual variation in the cardiometabolic stress associated with exercise intensity prescribed at a percentage of peak oxygen consumption (VO_{2peak}), a standard method for normalizing exercising intensity. The purpose of this study was to examine the relationship between individual cardiometabolic stress during exercise and the differences in the adaptive response to endurance training when exercise is prescribed as a set percentage of VO_{2peak} .

Methods: Nine recreationally active males completed two incremental ramp tests to determine VO₂peak and work rate at onset of blood lactate (OBLAWR) before and after four weeks of endurance training (END: 30 minutes at 65% of work rate at VO₂peak, four times per week). Heart rate (HR) and blood lactate were collected during and at the end of the first session of endurance training (END₁).

Results: OBLAWR increased significantly ($+29.3 \pm 28.8$ W; $p < 0.05$) and VO₂peak increased near-significantly ($+223.6 \pm 322.1$ mL/min/kg; $p = 0.07$) following END. No difference was observed in the mean magnitude of response in VO₂peak ($p = 0.3$) or OBLAWR ($p = 0.7$) between individuals who were above ($n = 6$) or at/below ($n = 3$) maximal lactate steady state during END₁. Blood lactate at the end of END₁ was significantly correlated with changes in VO₂peak ($r = 0.9$ $p < 0.05$). END₁ end lactate measurements did not correlate with increased work rate at OBLA ($r = 0.1$, $p = 0.85$).

Conclusions: These preliminary findings suggest initial lactate response at the end of an endurance exercise bout may explain the adaptive responses in VO₂peak following endurance training.

The Reality of Olympic Sprinting

Presenter: Patrick Gravelle, Mathematics and Statistics

Faculty Supporters: Dr. Andrew P. Dean, VP of Research and Innovation, Lakehead University and Dr. Deli Li, Professor of Mathematics, Lakehead University

Every four years, people from around the world gather together to watch the Summer Olympic Games. It is a time of excitement, unity, and excellent competition. However, it is also a time of inspiration for those watching, to pursue a new passion in sports. Moreover, one of the sports all individuals are so easily drawn to is that of sprinting. For there is a great simplicity, yet true power to being one of the fastest men or women on the planet. Whether an individual is competing or modestly observing, the world predominantly desires to see, not just who is fast, but who is the fastest. Moreover, this comes from many with the expectation of a world record from one or all sprinting events. However, are these expectations too high, or should the world feel let down when another Olympics passes without a new sprinting world record to claim? This paper aims to provide the exact answer to that question using the fundamental tools from mathematical statistics and probability.

Keynote

All are welcome!

Speaker's Corner, Stauffer Library

Thursday, March 9, 11:30 to 12:30

Welcome and Introduction, Dr. Vicki Remenda, Associate Dean (Teaching and Learning, Faculty of Arts and Science)

Presentation of Principal's Teaching Award for Promoting Student Inquiry to Dr. Steven Maynard, History

Dr. James Fraser, Professor, Department of Physics, 3M National Teaching Fellowship recipient, 2017

Science Fiction or Science Fact: Can Popular Sci-Fi Movies Motivate Real Research Questions?

Murray Dee, Seth Barling and their students – Rideau Heights Public School, Kingston
Creating a Community of Knowledge Builders: a Pedagogical Approach to Inquiry in a Grade 3 and 6 Classroom

Session III: Reimagining & Innovation 1

Speaker's Corner

Thursday, March 9, 1:00-3:00

Moderator: Dr. George Bevan, Geography & Planning

Chaotic Attractors in Tumour Growth

Presenter: Sam Abernathy, Mathematics and Physics

Faculty Supporter: Dr. Robert Gooding

Mathematical modelling of tumour growth has been studied by many scientists using a wide variety of techniques and approaches. In this thesis, I examine the role of "chaotic attractors," a term more commonly seen in the context of physics, using a model of three cell types: host, immune, and tumour. The relationships between these cell populations are derived from the law of mass action, often found in chemistry, assuming that a conjugate is formed in the interaction between immune and tumour cells. Just based on this quick holistic overview, the interdisciplinary nature of modern cancer research is displayed. My research, structured as an undergraduate thesis in Physics, seeks to combine multiple disciplines to develop a model and explain its underlying significance in the important real-world problem of cancer. This analysis is carried out computationally using mathematics and computer programming, but its significance is in the clinical setting, where similar models have been used by previous groups to analyse individual case studies. My work, still very much in progress, has as a goal to investigate the full set of possible parameters, so as to develop a deeper understanding of the underlying mechanisms inherent to this model.

Best Practices in Low Altitude UAV Mapping for GIS Applications

Presenter: David Aizikov, Geography and Planning/Geological Sciences and Engineering

Faculty Supporter: George Bevan

Aerial data collection for use in GIS has, in the past, been an expensive undertaking and required significant capital expenditures for metric aerial cameras, aircraft purchase, maintenance, fuel, insurance, and not to mention a significant cost for specialized labour. The advent of Unmanned Aerial Vehicles (UAV's), and their increasing mainstream use, has created an alternative to conventional aerial photography for the creation of Digital Surface Models (DSMs) and orthophotos. The standards of traditional aerial data collection have been spelt out in long-established guidelines by the American Society of Photogrammetry and Remote Sensing. UAV operators, often non-specialist newcomers to the field, have side-stepped these standards and have no means to ensure the quality and reproducibility of their data. I propose a set of simple best-practices that can be adopted both by UAV operators and their clients to establish some measure of Quality Assurance and Quality Control while maintaining the cost-advantage afforded by UAVs. These practices can be grouped into five main areas: 1) proper camera and lens selection, 2) pre-calibration of cameras used for photogrammetric mapping, 3) establishing accurate ground-control across the area of mapping and not relying on consumer-grade GNSS for air stations, 4) pre-flight calculation of flight parameters based on a clear accuracy requirement, 5) flying at a sufficient height to minimize relief displacement so as to create artifact-free orthophotos. It is hoped that a better understanding of the underlying principles of photogrammetry by both UAV operators and their clients will guarantee the proper implementation of UAVs for high-accuracy GIS data collection in the future.

A Theoretical Study of the Lubricating Abilities of 2D Layered Hydrogen Bonded Systems

Presenter: Chloe Graham, Chemistry

Faculty Supporter: Dr. Nicholas Mosey

It has been estimated that 100 million terajoules of energy is used every year to combat friction. For perspective, this corresponds to one fifth of the world's total energy expenditure. This significant amount leaves plenty of room for improvement. To reduce the environmental and financial impact of friction, lubricants are usually placed in mechanical systems and act as a barrier between moving parts. Lubricants come in many forms but they all have low energy slip mechanisms and resistance to conformational change under pressure. Chemicals with these properties can be predicted through some educated guesswork and computational simulations. Its advantageous to look at novel lubricants computationally because each small reaction can be analyzed, whereas in the lab it may be difficult to see the molecular mechanisms taking place in such short time spans. Additionally, computation is more environmentally friendly than hands-on testing because no chemicals are used. My research studies compounds found in nature and assesses their potential for use as lubricants. The focus of my studies has been on layered systems of melamine molecules that self-assemble into two-dimensional structures through hydrogen bonding. The layered nature of this system is similar to that of graphite – an effective layered lubricant; however, the reversibility of self-assembly may allow the layered structure to reform when disrupted during sliding to increase the robustness of the system. In this presentation, I will discuss the results of my simulations, with an emphasis on the structure of the system, the slip mechanism, slip energetics and friction forces.

Photogrammetric Stereoplotting of the Theodosian Palace at the Ancient Site of Stobi, Republic of Macedonia: Reviving a 20th Century Technique for the 21st Century

Presenter: Kavita Mistry, Classics

Faculty Supporter: Prof. George Bevan

The so called "Theodosian Palace" at the site of Stobi in the Republic of Macedonia was built in the 4th century AD and was thought to have been the temporary residence of the Roman emperor Theodosius I when he visited the city in 388 AD. This large structure was richly decorated with coloured marbles and mosaics, many of which have been restored over the years. Unfortunately, the walls that were consolidated prior to 2013 are now suffering serious deterioration and a proposal for this work is now being put together. As a necessary component of this proposal, stone-by-stone top-plans and elevation drawings are crucial to map the current state of these walls. Manual drawings using tape measures, plumb bobs and graph paper is immensely time consuming for such a large structure. As an alternative to these methods, we have employed Photogrammetric Stereoplotting to produce an accurate map of the Theodosian Palace. Using hundreds of overlapping photos taken of the walls with ground control points surveyed by a total station, highly accurate (<1cm) 3D data was generated using photogrammetric techniques. Individual stereo-models were then mapped in ADAMTech 3DM Analyst. Stereoplotting offers a faster and cost effective solution than manually mapping on site. By using hardware developed for the videogame industry -- active LCD glasses and high refresh-rate monitors -- mapping in 3D allows us to identify the shape and depth of the rocks and structures more accurately and intuitively than on a two-dimensional orthophoto. Once stereoplotted, the drawings are then inputted into AutoCAD Map 3D.

Validation of Breast Volume Measurement using Non-invasive Surface Scan

Presenter: Rachel House, Computing

Faculty Supporter: Professor Gabor Fichtinger

Introduction: Breast Cancer is the most frequently occurring cancer in Canadian women [1]. The standard of care normally involves breast conserving surgery and radiation therapy followed by breast reconstruction surgery. For successful breast reconstruction, the total volume loss must be accounted for. Unfortunately, the volume excised during surgery generally does not reflect total breast volume loss, for example, radiation therapy is known to cause volume loss of the breast [2]. Our goal is to provide the software and workflow necessary to calculate the breast volume using a non-invasive technique. By calculating and comparing the breast volume of the patient before undergoing reconstruction surgery to the baseline volume will help surgeon's better estimate how much tissue needs to be replaced.

Methods: A 3D surface scan of the patient's chest is obtained. The scan is then imported into 3D Slicer where modules are used to isolate the target breast and calculate the volume

Results: The method provided to calculate breast volume is feasible using 3D Slicer and only requires one surface scan from the patient. The ground truth breast volume of the mannequin was 164mL with a standard deviation of 4.1ml ($n=5$). The volume of the mannequin's breast was calculated using the workflow provided, the mean calculated volume was 160.8mL and the standard deviation was 4.7ml ($n=4$).

Conclusion: Using a 3D surface scanner provides a non-invasive and quick way to calculate breast volume. This initial validation suggests this system may be accurate enough to aid the surgeon in the reconstruction process.

References

- [1] Canadian Breast Cancer Society. (2015). *Breast Cancer in Canada, 2015*. Retrieved from <https://www.cbcf.org/ontario/AboutBreastCancerMain/FactsStats/Pages/Breast-Cancer-Canada.asp>
- [2] Haykal, Siba, Colin P. White, and Nicolas A. Guay. "An estimation of volume loss after radiation therapy on free flap breast reconstruction." *Plastic and reconstructive surgery* 131.6 (2013): 937e-939e.

The Use of Unmanned Aerial Vehicles (UAVs) in Slope Stability Assessment

Presenter: Connor Meeks, Geological Engineering

Faculty Supporter: Jean Hutchinson

The use and applications of unmanned aerial vehicles (UAVs) in geotechnical engineering is rapidly growing, leading to changes in the way that data is acquired, analyzed and processed. UAVs can reach areas previously inaccessible via ground or helicopter, while also being quickly deployed. Cameras are the current standard for data collection and 3D model creation.

There are multiple types of UAV's currently available. Quadcopters can take off and land in spatially constrained areas, but carry a small stabilized camera producing low quality models. Octocopters permit an increased payload, so a higher quality camera can be attached, allowing for increased model accuracy. Flight time is reduced by the additional weight. Fixed wing UAVs create higher quality photogrammetry models, and are commonly deployed over large surface areas. Transport Canada certification must be approved prior to any flights occurring for research or work. A detailed application must be created, including a flight plan and demonstration of prior flight experience.

At the White Canyon site in B.C., a Phantom 4 Quadcopter was flown for geotechnical analysis of a complex geometry slope, which has previously been studied for several years. The terrain has occluded the data available from the ground or from permissible helicopter flight paths. Therefore, detailed information from the slope has not been previously available. The process of using a UAV to obtain these data sets, to develop a full 3D model of these areas of the slope is discussed, considering the accuracy and quality of the data available.

Session IV: Patient Care 1

Seminar Room

Thursday, March 9, 1:00-3:00

Moderator: TBA

Perceptions of Inclusivity: The 24-Hour Movement Guidelines for Children and Youth

Presenter: Lauren Handler, Kinesiology and Health Studies

Faculty Supporter: Dr. Latimer-Cheung

In June 2016, Tremblay *et al.* published the first 24-Hour Movement Guidelines for Children and Youth. These guidelines integrate the daily requirements for physical activity, sedentary behaviour, and sleep into one comprehensive resource. Children with disabilities are less active and more sedentary than able-bodied individuals. Thus, it is important that health resources are developed and marketed to be inclusive and accessible to this population. The primary purpose of the study is to explore whether parents consider the 24-Hour Movement Guidelines for Children and Youth inclusive for children with disabilities. The secondary purpose is to assess whether these perceptions influence the decision to implement the guidelines. One 60-minute semi-structured in-person or telephone interview will be conducted with parents of children with disabilities. The diffusion of innovation theory will provide a theoretical basis for the interview questions and a thematic analysis will be used to analyze the results.

Investigating Tryptophan Hydroxylase Immunoreactivity in the Dorsal Raphe of Rats Exposed to Early Adversity

Presenter: Katheron Intson, Psychology/Centre for Neuroscience Studies

Faculty Supporter: Janet Menard

Prior studies link anxiety to alterations in serotonergic neurotransmission. Tao and Menard (unpublished data) found that female rats exposed to intermittent physical stress during early adolescence display greater levels of anxiety-like behaviours when tested as adults in social interaction tests. Interestingly, these behavioural changes were associated with changes in serotonin (5-HT) fiber density in the medial prefrontal cortex. Whether these changes in 5-HT fibre density are accompanied by changes in the number of 5-HT-producing cells in the dorsal raphe is not known. To examine this research question, tryptophan-hydroxylase (TPH) immunoreactivity (-IR) was used to label 5-HT cells in the dorsal raphe. Half the animals from the original adolescent stress study were exposed to IPS, and the remaining animals were handled only, serving as the control (CON) group. In adulthood, half of each of those groups were tested in the SI test. The remaining animals were not behaviourally tested, serving as home-cage controls (HCC). A two-factor analysis of variance will be performed with Treatment (IPS vs CON) and Testing (SI vs HCC) as the two factors. It is expected that, regardless of Testing, IPS rats will display higher levels of TPH-IR in the dorsal raphe than no-stress controls. The number of TPH-IR-positive cells will also be correlated with archival behavioural data. It is expected that that higher levels of TPH-IR will be associated with higher levels of anxiety-like behaviour. This study provides insights into the role that early adversity plays in shaping the structure and function of the brain's serotonergic system.

Spironolactone in Doberman Pinschers with Congestive Heart Failure due to Dilated Cardiomyopathy: The PRESDO Trial

Presenter: Andrew Laskary, Biomedical Science (Ontario Veterinary College/U of Guelph)

Faculty Supporter: Dr. Lynne O'Sullivan, Ontario Veterinary College

Dilated cardiomyopathy (DCM) is a primary myocardial disorder characterized by reduced contractility and ventricular dilation of the left +/- the right ventricle(s). In canines, Doberman Pinschers are a particular breed that are primarily genetically predisposed to DCM. Following a progressive preclinical phase, dogs may eventually experience congestive heart failure (CHF) in end stage. The renin-angiotensin-aldosterone (RAA) system plays a pivotal role in CHF progression causing poor prognosis. Therefore, the RAA system is an important target for pharmacological intervention. Current treatments in veterinarian standard therapy are only transiently effective due to incomplete RAA system blockade. Spironolactone, an aldosterone antagonist, has been implicated to more effectively blockade the RAA system as evidenced in human medicine. However, spironolactone has never been investigated in canines with CHF due to DCM. The primary objective of the study was to evaluate the effect of spironolactone on survival times in Dobermans with CHF caused by DCM. It was hypothesized that the group treated with spironolactone will exhibit a notable increase in time to endpoint. In a prospective, randomized, single-blinded, placebo-controlled clinical trial, 67 dogs were randomized to receive 50 mg of spironolactone twice daily (34 dogs) or placebo (33 dogs), in addition to standard therapies. Clinical follow-up was every 1 - 4 weeks until endpoint. Quality of life questionnaire and physical examination were performed at every recheck, while renal biochemistry, ECG, echocardiography, and thoracic radiography were reassessed as needed. Kaplan-Meier survival estimates were computed and compared.

Development and Assessment of an Intervention Program for Unmet Supportive Care Needs of Canadian Melanoma Patients and Survivors Attending an Outpatient Clinic

Presenters: Jahnvi Mundluru, Biology

Introduction: The rapid development of melanoma treatment options has significantly improved overall survival, but complementary patient education is not available. An environmental scan confirmed a lack of formal educational programs and support groups in the Durham region.

Objectives

- 1) Identify the supportive care needs of melanoma patients and survivors.
- 2) Develop an intervention program to address these needs.
- 3) Seek feedback on the program prior to implementation.

Methods: Utilizing a cross-sectional mixed method design, patients were recruited both prospectively and retrospectively. Participants completed a sociodemographic questionnaire and Supportive Care Needs Survey; those who consented attended a focus group. Statistical tests identified the highest reported needs and investigated any relationships with sociodemographic information. Focus group data was thematically analyzed.

Results: 75 patients and survivors completed the questionnaires; 46 males and 29 females. Most acknowledged their needs were satisfied, however significant unmet needs were identified in three constructs: psychological, health system and information, and melanoma specific.

Conclusion: Based on these identified high needs, a multifaceted program was developed to address the three constructs. Focus group feedback further reinforced the benefits of the intervention program. Currently the program is being reviewed for implementation and the intent is to complete a one-year post evaluation.

Impact of the Enhanced Patient Education System and Follow-Up Plan for Metastatic Melanoma Patients Treated with Ipilimumab

Presenters: Jahnvi Mundluru, Biology

Introduction: Immunotherapy while effective in treating melanoma, also causes immune related adverse events (irAEs). The Durham Region Cancer Centre created a program to reduce the irAE incidence: information session with a nurse prior to treatment, notifying circle of care about possible complications, and weekly phone call by nurses to patients.

Objective: To determine the impact of the education and follow-up program on the incidence and severity of immune related adverse events (irAEs) of metastatic melanoma patients treated with Ipilimumab.

Methods: A retrospective chart review was performed for patients treated with Ipilimumab between October 1st, 2013 and October 31st, 2015. The incidence and severity of irAEs was statistically analyzed.

Results: 14 of 18 identified patients received all doses. Four of these 14 patients had no treatment related side effects while 10 displayed irAEs ranging from grade 1-4. Specifically, five patients had grade 1-2 toxicities, and five had grade 3-4 toxicities. There were two toxicity related ER visits and three hospitalizations, but zero dosage delays.

Conclusion: The education and follow-up program showed a correlation with improved patient outcomes for irAEs. With immunotherapy rising in other cancers and fields, the time spent implementing this program is important to patient success in their treatment.

Skull Localization using Ultrasound for Navigated Neurosurgery

Presenter: Grace Underwood, Biomedical Computing

Faculty Supporter: Dr. Gabor Fichtinger

Image-guided navigation for neurosurgery requires accurate localization of the skull. Localization can be problematic when the patient is in a facedown position. The posterior skull lacks unique identifiable landmarks, which complicates standard localization methods using a tracked pointer. In addition to the lack of anatomical landmarks, trying to access facial surfaces is error-prone when working under the table and problems arise with line-of-sight of the optical tracker. We proposed the use of ultrasound to perform localization and investigated the accuracy of this process. A simulation study was performed to test the feasibility of ultrasound for localization on a plastic skull. An initial localization, using an optically tracked pointer, was performed to partially align pre-operative images and the skull model. Skull surface points were localized by optically tracked ultrasound and used in a surface registration algorithm. Accuracy and reproducibility was then investigated. Evaluation of the proposed localization method found that the average distance of points off the skull surface was $0.6 \pm 0.1\text{mm}$, which meets the same

standards set by current commercially available systems for face-up positions. Using tracked ultrasound for registration is feasible for patients in facedown position. We provided a non-invasive method of registration that could be accomplished using one optical tracking camera, and maintains a constant line-of-sight. This project was performed in cooperation with Dr. Gernot Kronreif and the Austrian Center for Medical Innovation and Technology. Dr. Kronreif and his staff are preparing for a clinical test of this localization process.

Session V: 5, 6, 7, 8 !

Speaker's Corner

Thursday, March 9, 3:15 -4:55

Moderator: Nathalie Soini, Information Services, Queen's Library

Waacking: A Shift from Gay Refusal to Gender Refusal

Presenter: Danella Ahlberg, Dan School of Drama and Music

The medium of dance is most often valued in Western society for its artistry and great skill of movement. However, the beauty of this medium often overshadows its ability to create pointed, and often political, messages through the body's kinesthetic movement in physical space. As embodied expression through time and space, dance must be understood as an art form that actively seeks to create meaning (Hellensleben 2010), a fact that is acutely evident in the dance form known as Waacking. Born out of improvisation-based techniques, Waacking originated in gay, Black and Latino underground disco clubs of 1970's Los Angeles. The gestures of Waacking were inspired by classical Hollywood glamour actresses, culminating in the distinctive fast, rhythmic arm whipping typical of this dance style. Yet, it is the more performative elements of the dance that holds one's interest by including components of large locomotion, dramatic gesture and facial expression, and a compelling narrative. This expressive style of movement resulted in Waacking becoming a catalyst for gay refusal, functioning as a method for gay men to express themselves and fully explore their identity. Through an analysis of personal experience and online videos in dialogue with the methodologies of embodiment, phenomenology, and performativity, I will explore how Waacking has shifted from a form of gay refusal to a form of gender refusal, allowing there to be a renegotiation of gender standards through the catalyst of black queer kinesthetics and gender kinesthetics.

Haunted Time in Music Theatre

Presenter: Amanda Baker, Computing and Drama

Faculty Supporter: Colleen Renihan

Theatre has always has a fascination with death and ghosts. The temporal underpinnings of these phenomena, however, have not been examined. In this presentation, I explore the concept of "haunted time," a temporality in which spectres of a mental and/or physical nature haunt the temporal experiences of the living characters on stage. Haunted time in music theatre can be represented both in its physical and psychological manifestations, and is often aided by two particular musical techniques: the glissando, and the use of atonal music—both resulting in a lack of tonal grounding to displace the listener-viewer's sense of linearity. Drawing on research in hauntology, temporality, philosophy and musicology, this presentation will explore the spectrum of mental and physical hauntological manifestations on the stage by exploring the ghosts and spectres present in three distinct music theatre productions: *Ghost: The Musical*, *Jekyll & Hyde*, and *Next to Normal*. In *Ghost: the Musical*, Sam is a physical embodiment of haunted time, existing in a state of neither living nor death, defying the ontological binary. In *Jekyll & Hyde*, the duality of Jekyll and Hyde is a non-physical manifestation of haunted time, represented through the struggle between good and evil. In *Next to Normal*, Gabe is a physical manifestation of the

mental affection of Diana, a representation of how she is haunted by the past living in her present. In all three cases, I will examine the distinct temporal shifts that signal the presence of haunted time.

Etruscan Dance Culture as Represented in Tomb Paintings from the UNESCO Heritage Site in Tarquinia (Italy)

Presenter: Anthea Morgan, Classics

Faculty Supporter: Dr. Colivicchi

Karen Kain, recipient of the Companion of the Order of Canada and artistic director of the National Ballet of Canada, wrote an autobiography entitled *Movement Never Lies* referring to a truism about professional dance. The UNESCO heritage site of Tarquinia (Italy) featuring Etruscan tomb dance imagery has never been studied through Classical scholarship from the perspective of a professional dancer nor from the perspective of analysis of depiction of movement. The author of this presentation, a former dancer with the National Ballet of Canada (1986-1992) who is a Classics Major, has endeavoured to prove that examination of movement depiction can be used as evidence to provide insight into Etruscan culture. Methodology for the study is based on the premise that Etruscan dance representations of humans Ca. 2500 years ago and the techniques of the dancer of today reflect actions by the same species; therefore, a comparative is possible for the essence of the movement communicated.

Results of the study indicate that representation of the Etruscan dance language is realistic and stable, is organically derived, is immensely practical, and has unique features within the Mediterranean cultural *milieu*. This preliminary study highlights the possibility of using ancient Classical cultures as models and terms of comparison for better understanding aspects of modern societies. It is salient that in contemporary culture, woman and children are dying to dance (from eating disorders), while Etruscans seemed to be dancing to live or to become ambassadors for an afterlife indicated by the Etruscan models.

Physical Theatre: Text in Body and Space

Presenter: Brandon Swann, Drama

Faculty Supporter: Grahame Renyk

This project explores the creative process of making physical theatre. I am exploring the creation of physical performance 'texts' that respond to a play script, but that do not incorporate spoken word as part of the storytelling. Up until now, my experience with theatre at Queen's has been mostly centered around the spoken word as the primary mode of storytelling. Even when that script has been a musical, complete with choreography and vocals, the process has still been largely centered around the spoken (or sung) text. With this research project, I am exploring storytelling in theatre through movement. I am experimenting with creating a physical theatre narrative, inspired by a previously published script (*Lilies* by Michel Marc Bouchard), but not entirely driven by the spoken word in that text.

This project includes concentrated research on noted physical theatre theorists such as Jacques Lecoq and Philip Gaulier, as well as on prominent physical theatre companies around the globe. Inspired by that research, I am workshoping a short piece of physical theatre. I will report on my experiences experimenting with creating a physicalized text in the rehearsal hall. The goal of this project isn't about removing or disregarding the text, but is instead it to use what is given, and perform it through a different medium of theatrical communication: the physical body.

Prologue to *Seuls* by Wajdi Mouawad

Presenters: Nicky Gayle, Chandler Gray, and Emily Kissick: French Studies

Faculty Supporter: Johanne Bénard

Seuls by Wajdi Mouawad is a Quebecois play that follows a young male, Harwan, in the midst of writing his doctoral thesis. After the discovery that he is in a coma, Harwan begins to remember elements of his childhood, and acknowledges his loss of identity in consequence of his young immigration, parental issues and lack of academic fulfillment. The objective of this communication is to create a prologue for the play *Seuls* that introduces the themes presented in the play. The prologue is an abstract projection that represents Harwan's mental journey and identity through audiovisual effects. While maintaining the abstract and visual themes of the play, the audience is given a conceptual preview while setting them up to best understand the play. Overall, this presentation explores the possibilities of expanding Mouawad's polyphonic structures to include an abstract soundscape and further develop his story of sensation, memory and art.

Session VI: Stimuli

Seminar Room

Thursday, March 9, 3:15-4:50

Moderator: Dr. Vicki Remenda, Associate Dean (Academic), Department of Geological Sciences and Geological Engineering

Stimulus Preference and Mental Imagery: Influencing the Way Sexual Stimuli are Viewed and the Intensity of Subjective Sexual Arousal

Presenter: Gabriella Boccone, Psychology

Faculty Supporter: Dr. Caroline Pukall

Background: The connection between mental imagery and feelings of presence within a film has not yet been investigated in sex research in relation to observational stance (imagining oneself as either a spectator or participant while viewing a film). Several studies have shown that people who take a participant stance when viewing a sexual film are more likely to report greater subjective sexual arousal (SSA). Research on observational stance has also found that viewing a preferred stimulus is predictive of taking a participant stance. Despite this, very few studies have allowed participants to select their own stimuli.

Methodology: Sexual films that were researcher-selected or participant-selected will be presented to women and men, while continuously measuring their SSA. Information will be collected about observational stance and vividness of mental imagery via questionnaires.

Expected Results:

1. Greater mental imagery ability will be associated with adopting a participant stance.
2. The relationship between mental imagery ability and taking a participant stance will be stronger for participant-selected sexual stimuli than for researcher-selected sexual stimuli.
3. Taking a participant stance will be associated with greater SSA.
4. The relationship between taking a participant stance and SSA will be stronger for participant-selected sexual stimuli than for researcher-selected stimuli.

Conclusions: This project is the first to examine the relationship between mental imagery and observational stance for sexual stimuli, and is among the first to allow participants to self-select stimuli. Results of this project will encourage the development of standardized procedures for providing participants with optimal sexual stimulation.

All-Fiber Photoacoustic Absorption Spectroscopy: Detecting Small Amounts of Dissolved Water in Jet Fuel

Presenter: Gavin Hatheway, Physics
Faculty Supporter: Hans-Peter Loock

Small concentrations of dissolved water in hydrocarbons such as lubricating engine oils and jet fuels prove detrimental to engine performance. In particular, high altitude operation can cause dissolved water to freeze, thus disrupting fuel flow and ignition temperatures in the engine. A new method to determine the concentration of dissolved water is explored using a high energy laser to excite the dissolved water in the fluid sample. Past methods include rigorous filtration systems or humidity tests that are time consuming and sometimes extremely temperature sensitive. Using a laser is a safe and non-invasive method that takes a matter of minutes for data collection. This Physics thesis is currently in the stage of establishing the detection of water excited by the high power laser. In the coming weeks, this project will progress to analyzing the collected data to calculate the amount of dissolved water in the fluid samples. The time efficiency and precision of this method provides an opportunity to develop a device that may be extended to industry for engine damage mitigation.

Does True Inter-Individual Variability Exist in Individual Responses After Endurance Training?

Presenter: Simo Lu, Kinesiology
Faculty Supporter: Brendan Gurd

Introduction: Despite the apparent existence of individual responses, it remains unknown whether the variability observed in peak oxygen consumption (VO_{2peak}) and work rate at onset of blood lactate (OBLAWR) response following exercise training reflects true inter-individual differences. To date, few studies include a non-exercise control group to determine the impact of random/measurement error on the variability associated with VO_{2peak} and OBLAWR responses to endurance training. Therefore, the purpose of this study was to determine whether true individual differences exist in responses to training by assessing whether the variability in VO_{2peak} and OBLAWR responses following training exceeded the variability in a non-training control group.

Methods: 16 recreationally active males completed two incremental ramp tests to determine VO_{2peak} and OBLAWR. Participants were assigned into the control group ($n = 7$) or the training group ($n = 9$; endurance training: 30 minutes of 65% of work rate at VO_{2peak} , four times per week) in a manner to counterbalance baseline VO_{2peak} measures.

Results: VO_{2peak} increased significantly ($p < 0.05$) ($+338 \pm 416.2$ mL/min/kg) and OBLAWR ($+32.1 \pm 29.2$ W) increased following endurance training. The SD in change scores was greater in the training group for VO_{2peak} and OBLAWR than the parallel control group. Specifically, this resulted in large and moderately-large effect sizes at respective values of 0.6 for VO_{2peak} and 0.5 for OBLAWR.

Conclusion: Although these preliminary results may suggest that the variability in VO_{2peak} and OBLAWR responses to endurance training reflect true inter-individual variability beyond random/measurement error, a definitive conclusion can be made upon the completion of the study.

S. Lu, C. LeBlanc*, M. Nelms*, L. Robins*, N. Preobrazenski*, J. T. Bonafiglia, and B. J. Gurd.
*These authors contributed equally to this work.

Learning Nouns and Verbs using Cross-situational Statistics

Presenters: Kavina Sathiyasothy, Kevin Chi, and Yifei Wang: Psychology

Faculty Supporter: Stanka Fitnev

Cross-situational learning is the process of associating words and referents across multiple individually ambiguous contexts. Our experiment uses eye-tracking technology to investigate the effects of word order on the cross-situational learning of nouns and verbs in 2.5 year old children. Participants watch a video in which novel objects and actions are presented simultaneously with novel words, and are tested on their understanding of these words following a five-minute break. The organization of the words is varied across three conditions by modifying the order of the object-referring word (noun) and action-referring word (verb): phrases are presented in noun-verb, verb-noun, or flexible word orders. Our research question investigates whether experience influences learning. As the standard word order in English is noun-verb, we hypothesize that if experience influences learning, participants will learn better in the noun-verb condition. We are also interested in whether nouns and verbs are learned equally well, and whether any differences in learning are related to the word order. Furthermore, children were presented with trials consisting of two familiar nouns and two familiar verbs. Eye tracking data from these trials were compared to test trial data to assess eye movement signatures of noun and verb recognition. Preliminary analyses provide stronger evidence of learning in the noun-verb condition than other word orders. We also see that the speed with which children oriented to the target on noun trials differ from verb trials. We further suggest that the study will contribute to our understanding of language learning and a more reliable interpretation of eye-tracking measures in research.

Studying the effect of Heartfulness Meditation on Brain Activity

Presenters: Pallavi Gupta, Jahnavi Mundluru, Arth Patel, Shankar Pathmakanthan

Faculty Supporter: Dr. Norman Farb, University of Toronto

Long-term meditation practice is increasingly recognized for its health benefits. Heartfulness meditation represents a quickly growing set of practices that is largely unstudied. Heartfulness is unique in that it is a meditation practice that focuses on the Heart. It helps individuals to connect to themselves and find inner peace. In order to deepen ones' meditation, the element of Yogic Energy ('pranahuti') is used as an aid during meditation. The purpose of this study was to determine whether consistent EEG effects of Heartfulness meditation be observed in sixty experienced Heartfulness meditators, each of whom attended 6 testing sessions. In each session, participants performed three conditions: a set of cognitive tasks, Heartfulness guided relaxation, and Heartfulness Meditation. Participants during the cognitive portion were required to answer questions that tested their logical thinking (Cognitive Reflective Test) and creative thinking skills. (Random Associative Test) The order of condition was randomly counter balanced across six sessions. It was hypothesized that Heartfulness meditation would bring increased alpha (8-12Hz) brain activity during meditation and better cognitive task scores in sessions where the tasks followed meditation. Heartfulness meditation produces a significant decrease in brain activity (as indexed by higher levels of alpha during the early stages of meditation. As the meditation progressed deep meditative state (as indexed by higher levels of delta) were observed until the end of the condition. This lead to the conclusion that Heartfulness Meditation produces a state that is clearly distinguishable from effortful problem solving.

Session VII: Community & Identity

Speaker's Corner

Friday, March 11, 9:00 to 10:20

Moderator: Dr. Petra Fachinger, English

Food as Power

Presenter: Kiana Choi, English

Faculty Supporter: Petra Fachinger

This paper is a critical analysis through a close reading of Eden Robinson's short story, "Traplins" that addresses the topic of Indigenous identity, particularly the identity of Indigenous youth in the wake of the parents' generation residential school experience. Robinson's story focusses on the life of a teenaged Indigenous boy called Will, who is exposed to family violence and substance abuse, going to school in town. I argue that the text emphasizes the colonizing nature of non-Indigenous interference in the lives of families like Will's as proof of continuing colonization. Will's English teacher and other white characters use their white privilege in and outside of places of consumption as representations of power in the text. The result of this imbalance of power is the development of a confusing fragmentation of identity in the Indigenous youth. In its discussion of Will's confusion, the text raises questions about the nature of education.

The Glass Wall of Opera Houses

Presenter: Parker O'Connor

Faculty Supporter: Natalie Rewa

In the twenty-first century, many argue that Opera is a dying art form and no one wants to see an opera. However, since 2000 many opera houses have been built around the world in centres without longstanding traditions of opera. As a result architects are now forced to balance the centuries of traditions of opera with a contemporary audience. Architect and city developers have begun to think of inventive ways to use architecture of opera houses as a lure to attract those who might not typically attend the opera. The act of going to the opera begins with the transportation chosen to get there, followed by interaction with the public spaces outside, through the doors into the public lobby, and finally into the auditorium. The opera house can be a space that people do not only go to see a performance but to feel like a part of a community. This integration is developed through the architecture of the opera house and, in particular, the choice of material of glass in many contemporary opera houses. This relationship of community inside versus outside the opera house is permeable through this glass wall. Understanding the opera house as a creator of community allows for opera to remain an integral part of culture moving further into the twenty-first century.

Kingston's Inner Harbour: Belle Island to Anglin Bay

Presenter: Ashley-Elizabeth Best, English

Faculty Supporter: Petra Fachinger

My project is an eco-poetic inquiry of Kingston's Inner Harbour. It contains several poems and photographs. The Inner Harbour provides an interesting case study of the intersections between industry, history and ecological preservation. This project evolved from an eco diary assignment in which I actively decided to consider the poem an environmental form that moves beyond the limitations of descriptive aesthetics to lived experiences of ecological processes. It forced me to re-evaluate my relationship with this particular biotope, and how to destabilize an ingrained human-centred mode of

thinking and interacting with the environment. Ecological poetics extends beyond describing or being about nature, and aims to provide a deeper engagement with the environment. This research connects with my book, *Slow States of Collapse*, in regards to my approach to poetry as an open-ended dialogue that can adopt many forms and styles to illustrate lived experiences. Language, in this case poetry, can play an important role in ecological understanding.

Defusing the Bomb: Ruth Ozeki's *All Over Creation* and the Death of the Nuclear Family

Presenter: Evelyn Ekoko-Kay, English

Faculty Supporter: Dr. Petra Fachinger

In Ruth Ozeki's novel *All Over Creation*, complex, nontraditional familial structures are depicted and explored in conjunction with the human impact on the natural world. The paper examines Ozeki's novel through an ecocritical, anti-capitalist lens, in order to interrogate how the novel deals with, conforms to, and subverts notions of the heteropatriarchal nuclear family. While many narrative threads in the text seem to naturalize the nuclear family as an ecological norm and a biological imperative, as opposed to a capitalist construction, I argue that the novel's underlying themes and motifs assert a need for broader, non-biological familial networks as a means of countering the individualism and isolation fostered by capitalism. By linking family to the ecological world, and positioning capitalism and its tenets as a direct threat to both, the novel calls for a redefining and restructuring of family and community as a necessary tactic for disrupting environmental and social devastation, and healing both people and the natural world.

3 Minute Thesis: "One slide, no props, 3 minutes"

Speaker's Corner, Stauffer Library

Friday, March 10, 10:30- to 11:30

Student participants present their research and its wider impact in 3 minutes or less to a panel of non-specialist judges:

Brandon Jamieson

Elisha Krauss

Nick Preobrazenski

Presented by the Alma Mater Society

Session VIII: Pizza with Posters, 11:30-1:00

See poster abstracts beginning on page 30

Session IX: Curios

Union Gallery, Stauffer Library

Friday, March 10, 1:30 – 2:30

Moderator: Jillian Sparks, Special Collections, Queen's University Library

A Taste of the Library

Presenters: Ashley Anderson, Kaitlyn MacDonald, and Hannah Thiessen: History

Faculty Supporter: Steven Maynard

Eating is one of the most innate human instincts. People need food to survive, and food and the culture around eating have been transformed into indicators of personal, community, and national identity. As an often-overlooked branch of social history, food history provides a critical look into the social nature of our nation's past, as well as the effect of food on the culture and politics of Canada. It is for these reasons our course has decided to mount an exhibit in Special Collections on the history of food in Canada, showcasing the Library's historical cookbooks. We will be structuring our exhibit through the lens of the following critical themes: Food Nationalism, Women and Community, Multi-culinary-ism, Business of Food, and Local Food Sources in Kingston, using cookbooks dating as far back as the 19th century. These will be brought together to share a glimpse into the study of food history and its importance within Canadian Social History. Sifting through the impressive assortment of cookbooks that W.D Jordan Rare Books and Special Collections has to offer will lead to the selection and presentation of 25 cookbooks that are an essential representation of the food history of the nation. Representing our classmates, we hope to share an overview of our research with Inquiry@Queen's and promote our exhibit, which opens two weeks after the conference.

Hogarth and Bad Taste: The Sculptures at St. Bartholomew's as Satirical Inspiration

Presenter: Timothy Revell, Art History

Faculty Supporter: Prof. Stephanie Dickey

The engraving *Masquerades and Operas* (1724), also known as *The Bad Taste of the Town*, was William Hogarth's first self-published work. Despite this milestone, it has become a footnote to more studied works such as *The Rake's Progress*. I have discovered that Hogarth used sculptures from the Henry VIII Gate at St. Bartholomew's Hospital in London on his depiction of the Great Gate of Burlington House (home to the Royal Academy of Arts); I believe this is an overlooked element of the print that signals his distaste for foreign art. Hogarth strongly opposed Italianate painting and architecture, even painting frescoes at St. Bartholomew's gratis, after learning the commission had gone to an Italian. Through visual, political, and contextual analysis, I argue that allusions to Raphael and Michelangelo in *Masquerades and Operas* associate Italian art with "lameness" and "disease" and are meant to show the decadence of Italian art and its impact on the arts in England. Their position on the Henry VIII Gate further alludes to the malignancy of the aristocracy, whom Hogarth saw as adversely affecting British culture by adopting foreign influences.

The Brexit vote and global political turmoil are at the forefront of today's political situation. In this regard, it is valuable to look back at times of significant cultural change and examine why artists like Hogarth, and contrastingly, Hogarth's nemesis William Kent (a proponent of classical architecture inspired by Italian examples), strove for and against intercultural exchange.

Exploring the Tinsel Prints of the Robertson Davies Collection

Presenter: Ally Zmijowskyj, Art History and Classical Studies

Faculty Supporter: Jillian Sparks (W.D. Jordan Rare Books and Special Collections)

Like modern baseball or hockey cards, tinsel prints were collectable images of famous actors and actresses produced in nineteenth century England. They could be purchased as singles or in sets of six or four, in colour or in black and white form. The purchaser could buy bags of prepared tinsel decorations along with the prints making them customizable. Thus, after the tinseling process, no two prints would be identical. This study focuses on the tinsel prints in the Robertson Davies Collection held at the W.D. Jordan Rare Books and Special Collections Library at Queen's University. This research was conducted at the beginning of the campaign to conserve and rehouse the tinsel prints in from the Canadian author and playwright Roberston Davies' personal collection. Each print was studied to determine the actor featured, the role they portray, the play this character is from, and the place each print has in the larger collection. The tinsel prints from the Robertson Davies Collection were also compared to tinsel prints in larger collections such as The Museum of London, The Victoria and Albert Museum, and The Folger Shakespeare Library, to assess the individuality of each print. The findings of this research formed the foundation of an Omeka based website to showcase the outcomes as well as high resolution pictures. This publically accessible platform allows for those outside the Queen's community to explore the Robertson Davies Collection and further their own knowledge on 19th century English theatrical ephemera.

Session X: Reimagining & Innovation 2

Speaker's Corner

Friday, March 10, 1:00 – 3:00

Moderator: Dr. Johanne Bénard, French Studies

The Human-Machine: Possibilities for Expression in Robotic Dance

Presenter: Hannah M. Brown, Music

Faculty Supporter: Dr. Margaret Walker

Robots have been a source of both intrigue and anxiety for artists and a lively apparatus for study by scientific researchers for several decades. Though many people view robots as being cold, unemotional, and frightening, there is a growing field in robotics specifically focused on social applications including therapy, elder care, and the arts. Robots have been utilized extensively in installation art works and sculpture, but the performing arts have been somewhat more resistant to them. Machines which have all the technical abilities to perform tasks, such as playing an instrument or executing choreography without fatiguing or making errors, can be threatening to human performers who have honed these abilities and rely upon them for creative expression and their livelihoods. By synthesizing studies in the scientific field of social robotics, philosophical insight into technology and the arts, and case studies of robots used in dance and other art forms, I seek to provide an alternative point of view of robotic integration into performance. Robots do not need to act only as avatars of human beings, they can be effectively utilized in dance to expand upon the capabilities of the human body, act as automatic 'puppets' for choreography, integrate into human performance, and be 'autonomous' performers in their own right. Robot dancers do not inherently replace or devalue human artists; instead, they can provide complex insight into the understanding of human bodies, emotions, and technology.

En attendant Godot: L'attente continue

Presenters: Jacqueline Rebchuk, Tina Milicevic, and Juliana Varela: French Studies

Faculty Supporter: Johanne Bénard

En attendant Godot, dont la création à Paris remonte à 1953, est une des pièces les plus célèbres de Samuel Beckett. La fin de cette pièce qui laisse en suspens les spectateurs, dont l'attente sera déçue, est tout aussi connue. Les interprétations de cette fin ouverte sont innombrables et le sens de cette pièce demeure énigmatique. Bien que Beckett lui-même ait toujours refusé de donner un sens religieux restreint à Godot, plusieurs critiques n'ont pas manqué d'y voir une interprétation possible. Ainsi, la pièce se termine avec le garçon qui annonce à Vladimir et Estragon, les deux personnages centraux de la pièce, que Godot ne viendra pas. Les deux vagabonds se demandent alors s'ils doivent partir, mais, comme cela survient plusieurs fois dans la pièce, ils ne bougent finalement pas. Notre projet, qui repose sur une expérience d'écriture, vise à explorer la possibilité d'une fin alternative pour la pièce, avec l'arrivée de Godot. Nous avons également tenté de proposer un sens religieux à Godot. Dans cette présentation qui sera bilingue, nous examinerons d'abord brièvement les thèmes généraux de la pièce et examinerons sa structure répétitive. Nous exposerons ensuite notre scène alternative, que nous étudierons pour montrer la difficulté, voire l'impossibilité, de changer la fin de la pièce de Beckett. Nous concluons en proposant que cette expérience de création permette une meilleure compréhension de la pièce de Beckett et de ses défis interprétatifs.

How Did the Case of Jack the Ripper help the Metropolitan Police and Forensic Science?

Presenter: Sandra White, History

Faculty Supporter: Dr. Dinah Jansen

This study will examine the links between the historical case of Jack the Ripper, the history of forensic science, and the advancement of policing for the Metropolitan Police and forensic in Victorian Britain. Ripper's crimes were committed in a 'pre-forensic science' period, when there were no fingerprints, DNA, or crime scene investigation units to help Detectives capture sophisticated criminals, but through this case forensic science and the Metropolitan Police Force would develop into a more modern form of policing. Jack the Ripper can be considered the prototype of the definition of a serial killer, and his crimes were of a nature that police had little experience with, which meant the police force would have to develop new techniques in criminal investigation. This study will examine the early history of the Metropolitan Police, how the young police force—less than sixty years old by the first murder of Jack the Ripper—was organized, the tools available for investigating murders, how the case of Jack the Ripper led to advancements in criminal investigation and how these new techniques were used to solve other crimes. The Metropolitan Police and British pathologists—such as Dr. Bernard Spilsbury—developed new ways of catching criminals because of the Jack the Ripper case, such as crime scene preservation, profiling and the use of photography to capture crime scenes that would be used to solve the case of Dr. Crippen in 1910 and the Bathtub Murders in 1915.

"L'enfer, c'est les autres":

Photographic Representations of Character Development in Sartre's Huis clos

Presenters: Daniel Habashi, Shannon Hogan, Victoria Wolf: French Studies

Faculty Supporter: Dr. Johanne Bénard

Huis clos (No Exit), a play by Jean-Paul Sartre, is an unconventional representation of Hell, where three individuals torture one another in a Second Empire style lounge complete with a butler, a servant bell, and extravagant furniture. Estelle, Inès, and Garcin are eternally inseparable, and their non-violent

manner of torture - namely, the manipulation of each other's earthly insecurities - inspires the famous quote "L'enfer, c'est les autres" ("Hell is other people"). In our presentation, we will explore the possibility of transposing this famous play in a different artistic medium.

As an alternative medium to theatre, photography uses instantaneous frames to capture the complex details of character relations and theme without deviating too far from the play's original form. Our work consists of a series of three photographs that use symbolic objects and body language to illustrate each character's unique version of Hell. When taken both individually and as a whole, these photos represent a cycle of mutual torture and mutual dependence, and highlight the ways in which the characters' past lives influence the form that torture takes in the afterlife. Parts of this presentation will be in English, and components requiring textual analysis will be done in French.

Session XI: Patient Care 2

Seminar Room

Friday, March 10, 1:30 – 3:15

Moderator: TBA

Using the Talk Test to Prescribe and Guide Exercise Intensity: Speaking Your Way to Improved Fitness

Presenter: Nick Preobrazenski, Kinesiology

Faculty Supporter: Dr. Brendon Gurd

Introduction: The Talk Test (TT) is a non-invasive, subjective method of prescribing exercise intensity. The TT involves three stages. When exercisers can speak comfortably, can speak but not comfortably, or cannot speak comfortably, they are in the positive (POS), equivocal (EQ), and negative (NEG) TT stages, respectively. The NEG stage correlates with important physiological markers such as ventilatory threshold and lactate threshold. Given the evidence demonstrating large increases peak oxygen consumption (VO_{2peak}) when training at intensities above these markers, the purpose of the study was to test the hypothesis that the TT is efficacious for improving VO_{2peak} at both the group and individual level in young, healthy males.

Methods: 11 healthy males completed a maximal fitness test before and after 4 weeks of training 4 times per week for 30 minutes in the NEG stage. The TT was performed every 2.5 to 5 minutes to ensure that the resistance would be enough to elicit a NEG response. Changes in VO_{2peak} below 2 times a previously established typical error were classified as non-response.

Results: Four weeks of training at NEG induced a significant increase (11.5%) in VO_{2peak} (PRE: 45.80 mL/Kg/min \pm 4.92; POST 51.07 mL/Kg/min \pm 5.45, $p < 0.001$). Furthermore, only one participant (9.09%) was classified as a non-responder in VO_{2peak} following training.

Conclusion: These results suggest that the TT can efficaciously prescribe and guide exercise intensity in young, healthy males, and that training at an intensity that prevents comfortable speech leads to a small incidence of non-response.

Investigating Binding Mechanisms of Small Molecules to Quadruplex DNA

Presenter: Alana Rangaswamy, Chemistry

Faculty Supporter: Dr. Anne Petitjean

Guanine quadruplexes (G₄) are dynamic structures found naturally in guanine-rich DNA. When folded, they have been found to block the expression of genes related to diseases including cancer¹ and are therefore of significant interest in the field of biomedical research. Our research group has developed a family of chemical binders which strongly stabilize folded G₄. This project focuses on quantifying the interaction of these binders with various quadruplexes, through their *binding constant* (a measure of relative preference for the bound vs unbound state). These constants can be determined through the use of a Fluorescence Intercalation Displacement (FID) biophysical assay,² a method which measures the competitive binding of the binder molecule and a fluorescent probe to the quadruplex (see figure 1). As a preliminary step, we perform direct titrations of the fluorescent probe, Thiazole Orange (TO), with quadruplex DNA, to determine its binding constant and TO:DNA stoichiometry. TO fluoresces only when bound to a substrate,³ allowing us to track the formation of the TO*DNA complex through an increase in fluorescence. In the FID titration, however, the binder displaces the fluorescent probe, and a decrease in fluorescence intensity is observed. We also discuss mathematical methods used to fit the experimental data in order to determine binding constants for both the fluorescent probe and our binders. A robust model should give evidence in support of the expected binding phenomena.

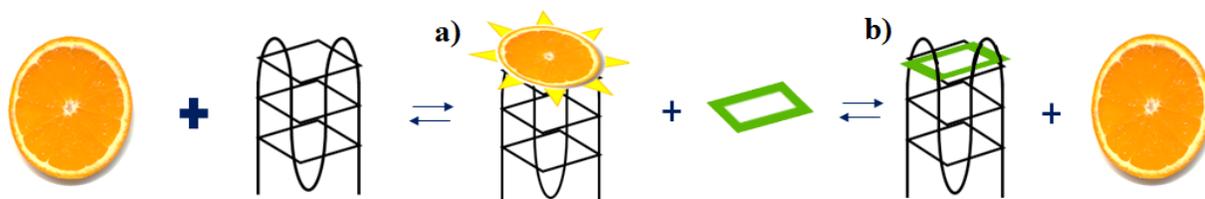


Figure 1. Scheme for competitive binding of TO (orange) and binder molecule (square) to G₄ DNA. In practice, these two experiments are performed separately to determine binding constants for a) Thiazole orange and b) the binder molecule.

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Evaluating a Motivational Interviewing Workshop for Medical Students at Queen's University

Presenter: Sarah Skelding, Kinesiology and Health Studies

Faculty Supporter: Dr. Lucie Levesque

Motivational interviewing (MI), a partnership-based counselling style, has increasingly been used to promote behaviour change among adults. Despite its potential to support behaviour change, there is a lack of research examining the most effective ways to train health care practitioners to use MI when working with patients. The purpose of this research was to evaluate uptake of MI skills following a one-day MI workshop that was developed in partnership with Exercise is Medicine for second year medical

students enrolled at Queen's University. The workshop focused on developing a basic understanding of the MI spirit, the phases of MI, and the ways in which MI may be used in different behavioural contexts. Participants (n=69) were asked to complete a pre and post-questionnaire that explored their knowledge of MI and their current perceptions of MI in addition to completing the Helpful Responses Questionnaire (HRQ), a validated MI assessment tool. A process evaluation was also conducted for each facilitator to measure fidelity to MI during the workshop. Results from the process and outcome evaluations are currently being evaluated. Results from this study will help determine whether a one-day workshop format is an appropriate delivery method for teaching MI techniques. Future research is needed to determine if medical students utilize information gained in their medical practice.

Predicting Chemotherapy Treatment Outcomes in Ovarian Cancer Patients Using Gene Expression Analysis

Presenter: Anastasiya Tarnouskaya, Computing

Faculty Supporter: Dr. Qingling Duan

Ovarian cancer is the abnormal development of cells found in the ovaries. It is the fifth most fatal cancer amongst women and has an overall five-year survival rate of 45% (American Cancer Society, 2016). For women with newly-diagnosed, advanced stage ovarian cancer, the current standard of care is surgery – to remove as much of the cancer as possible – followed by chemotherapy – to kill the remaining tumour cells (Cancer.Net Editorial Board, 2016). However, chemotherapy can have devastating side-effects such as infection, nausea, reduced cognitive function, and death (Sun, et al., 2005). Using patients' genomic profiles to predict how well they will respond to the standard of care will be valuable for patients when deciding whether to pursue standard or alternative forms of treatment. This study uses ovarian cancer patient data compiled by The Cancer Genome Atlas (TCGA). Clinical data – such as patient age, gender, ethnicity, disease severity and treatment undergone – is used to define which patients responded well to chemotherapy. Patient gene expression data – which gives insight into which genes are up- or down-regulated – will be used to identify markers of chemotherapy response. This will be done using differential gene expression analysis – to identify individual genes that contribute to chemotherapy-response – and network analysis – to understand how the expression of these genes functions as a system. To make the results of the study clinically relevant, chemotherapy-response markers will be correlated to single nucleotide polymorphisms – a form of genetic variation that is much quicker to test for in a patient than gene expression.

The Impact of Health Literacy and Numeracy on Post-Transplantation Outcomes in Organ Transplant Recipients

Presenter: Mary Zhu, First Year Science

Background: Patients referred for solid organ transplant with limited health literacy have been shown to be less likely to have access to transplantation. We examined the association between health literacy, health numeracy and post-transplant clinical outcomes (i.e. graft failure, non-adherence, readmissions, self-efficacy, or mortality).

Methods: A search of Medline for publications during the period January 1946 to July 2016 that examined health literacy, numeracy, and outcomes of transplant recipients. Titles and abstracts were independently examined by three reviewers for exclusion, and the full-text was then reviewed for inclusion.

Results: Of 247 citations, 12 met inclusion criteria including one review article and five randomized control trials (RCTs). Health literacy of recipients was measured using Newest Vital Sign (NVS) (n=2),

Short Test of Functional Health Literacy in Adults (STOHFLA) (n=2), Rapid Estimate of Adult Literacy in Medicine (REALM-T) (n=1), and other knowledge questionnaires (n=5). Level of formal education was also examined as an assay of health literacy (n=3). Post-transplant outcomes were assessed through medication adherence (n=4), skin cancer incidence (n=2), graft loss (n=1), recipient mortality (n=1), kidney function (n=1), health-related quality of life (n=1), and self-efficacy (n=1). Eleven citations found limited health literacy to be associated with adverse post-transplant clinical outcomes, and one citation found no association between health literacy and non-adherence. Health numeracy was not studied in any of the citations.

Conclusion: Health literacy is negatively associated with adverse post-transplant clinical outcomes. Future studies should analyze the association between health numeracy and clinical outcomes after transplant.

Session VIII: Poster Presentations

Queen's Learning Commons, Stauffer Library

Presenters will be present at posters Friday, March 10, 11:45-1:00

Posters will be on view March 9 & 10

1. A Decade of Dwarf Birch Growth across a Canadian Low Arctic Landscape: Exploring the Impacts of Climate Change

Presenter: Rhett Andruko, Biology

Faculty Supporter: Dr. Paul Grogan

Climate change predominantly affects northern regions, and resultant vegetation change (particularly the expansion of arctic shrubs) has the potential to create large-scale, positive climate feedbacks, including the widespread release of CO₂ from arctic soils. Understanding the intensity and distribution of arctic shrub expansion is therefore necessary to predict future climate trajectories. Few studies, however, have directly measured vegetation changes in the Canadian continental low Arctic, and similarly, there is a need to better understand the landscape-level factors that determine shrub growth responses to warming. Previous studies in Alaska indicate strong differences in shrub growth responses between habitat-types, attributed to higher nutrient and water supply in low-lying areas. Therefore, this study examines growth patterns of the dominant shrub (Dwarf Birch, *Betula glandulosa*) in a variety of habitat-types across a low arctic landscape.

Significant increases in both shrub cover and stature over ten years were found, but surprisingly there were no differences in growth between habitat-types. Further analyses (pending) will measure inter-annual shrub growth to compare patterns/degrees of variability between habitat-types. Individual shrub growth rates over the past decade correlated to local soil nutrient concentrations, but no other variables, suggesting that local spatial variation in nutrient availability seems to be the primary factor determining shrub growth responses to climate change. Overall, our preliminary results stress the importance of local nutrient variability in controlling shrub responses to warming, and challenge previous studies indicating strong differences in shrub growth responses to warming among habitat-types.

2. A role for DA Mechanisms in the ovBNST in Compulsive Responding in Rats

Presenter: Valerie Bian, Psychology

Faculty Supporter: Mary C. Olmstead

Out of the primary characteristics of drug addiction, compulsive drug seeking and intake is perhaps the most insidious, as it results in voluntary substance use despite negative physical and social consequences.

For substances that are not considered classically addictive, such as sucrose, animal models of drug addiction may be utilized to explore reward-related synaptic changes underlying compulsive behavior similarly observed in binge eating disorders. Binge eaters, like those who compulsively seek out and consume drugs, continue to consume food despite the negative consequences. Based on previous work done by Maracle (2012), we examined the effects of modulating signalling in the oval bed nucleus of the stria terminalis (ovBNST) with a competitive D1 antagonist and its effects on compulsive intake. Prior to the intermitted access phase, subjects (N=66) underwent intracranial surgeries targeting the ovBNST. We utilized the same intermitted access cycle developed by (Avena, 2010). The subjects were randomly assigned to one of the four groups, 12-hr sucrose (primary experimental group), 12-hr saccharine (sweet taste control group), 12-hr food only group, and a 24-hr sucrose/food group. After the 28-day cycle, subjects were then randomly assigned to received infusions of either saline or a selective D1 antagonist (SCH 23390) 10mins prior to testing. Compulsive responding for sucrose was then assessed using a conditioned suppression paradigm. It was hypothesized that infusing a DA antagonist into the ovBNST will decrease compulsive responding in subjects who demonstrate bingeing behaviour during the intermitted access phase, but will not affect animals that do not demonstrate bingeing behavior.

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3. Hybridization between Thick-billed and Common Murres

Presenter: Lila Colston-Nepali, Biology

Faculty Supporters: Dr. Vicki Friesen and Anna Tigano

Thick-billed and common murres are migratory seabirds that breed in colonies in the North Pacific and North Atlantic oceans. Despite these sister species diverging 6.5 million years ago, they have been found to hybridize. In this study, hybridization between thick-billed and common murres was investigated in 15 Atlantic colonies of murres. Some colonies were single species colonies, and at other colonies both species breeds. DNA from wing samples collected from the annual murre hunt in Newfoundland and Labrador was also analyzed. Restriction-site associated DNA sequencing was performed on the samples, identifying single nucleotide polymorphisms throughout the genome. The program STACKS was used to identify and genotype loci. Software such as STRUCTURE was used to investigate admixture between the two populations. 32 of 166 common murres and 26 of 188 thick-billed murres were identified as hybrids. This totaled to 16% of the samples, a higher proportion of hybrid murres than found in previous studies of Pacific colonies. Interestingly, a significantly larger proportion of hunted than non-hunted birds were identified as hybrids. Furthermore, hybrid individuals were found at both shared colonies, and those where only one species breeds. As top predators that are threatened by human-mediated activities such as hunting and oil pollution, and that may be vulnerable to climate change, research into the

hybridization of murre has numerous conservation implications. Currently, there is uncertainty of the impact hybridization will have on the murre populations, and research into the rate and trends of hybridization is of importance.

4. Amber-guity: A coming of Age Tail

Presenter: Ellen Handyside, Geological Engineering

Faculty Supporter: Alex Dececchi

Vertebrate inclusions in amber deposits are rare in the fossil record, known for only a few localities and time slices. Yet their 3D preservation of both hard and soft tissues offer paleontologists a detailed glimpse into the biology of extinct life that is not possible through other preservation methods. Here we will discuss a new study on a previously unreported fossil lizard specimen preserved in amber that has been housed in the collections of the Queen's Miller Natural History museum for decades. Our goal is to establish the provenance of the sample as well the identity of the entombed lizard. Using Fourier Transform Infrared Spectroscopy (FTIR) we not only confirmed the specimen's authenticity but have gained insight into how its spectra compares to samples from known localities to aid in confirming its source. We are employing stable isotopic analysis to further refine our knowledge of this specimen's original location as well as the depositional environment. Finally, in conjunction with colleagues at McGill University we have CT scanned the sample and created high-resolution 3D images of the lizard, allowing us to analyze its evolutionary biology and possibly discover a new species.

5. Determining Groundwater Inputs into High Arctic Lakes (Cape Bounty, Melville Island, NU)

Presenter: Maddie Harasyn, Geography

Faculty Supporter: Scott Lamoureux

The focus of this research project is to determine the presence of groundwater seepage within two High Arctic lakes located in continuous permafrost on Melville Island, NU. Small isolated depressions were located at the bottom of each lake using bathymetric data – 21 in East and West Lake (unofficial names) combined. It was hypothesized that these depressions could be the sites of groundwater seepage into the lakes, and these locations then served as sample sites for CTD cast and water sample collection during the 2016 field season. Water chemistry and physical property data were used as indicators of groundwater seepage, as ground water would have properties similar to the source of the ground water, generating a change in water chemistry at each of these sites.

Ionic analysis has showed site specific change at the bottom of both lakes, related to the underlying bedrock structure. Ionic ratios for the northern sites differ from ratios of the rest of the sample sites, as well as the ambient water of each lake. This correlates with the meeting of two geologic units within both lake limits. Physical characteristic data showed no change within East Lake and a localized change within West Lake, represented as an increase in electrical conductivity and decrease in dissolved oxygen. These results suggest that highly localized groundwater seepage is likely occurring in these High Arctic lakes, and that water property influences to ground water may be even more highly localized.

6. The Art of Absence: The Practice of Contemporary Curating

Presenters: Elizabeth Handley-Derry and Eunice Kim, Art History

Faculty Supporter: Jennifer Kennedy

In fall 2016, ARTH 422: Contemporary Curating had the unique opportunity to curate an exhibition for the spring 2017 season at the Agnes Etherington Art Centre. Under the guidance of Jennifer Kennedy,

our curatorial team of 12 students worked closely together to develop a theme, set out objectives, select art works from the Agnes' Contemporary Collection, and organize an exhibition catalogue.

The curator has gained a significant role with the emergence of Contemporary Art, which predominantly de-emphasizes the tangible object and relocates it to the idea. Whereas traditional concerns included style, mode, medium and ideology, contemporary artists express interests encompassing place making, world picturing, and connectivity. As a mediator between artists and audiences, the curator treats art as a verb: transforming a constellation of silent objects into a moving, illuminated, dynamic experience.

Our process began with researching and developing a theoretical and applied understanding of a curator's role and contemporary curatorial practice. Our collaborative process involved investigations of 'absence' along with the affective, existential, and relational intensities that live beyond our perceptive abilities. As a team of 12, we collectively worked through the challenges of reaching an open audience, limitations of physical space, time constraints, and adapting to unforeseen complications. As curators, we worked to create an affective experience/dialogue that goes beyond the initial encounter of art and offer a space to bridge the gap between art and life. Our aim in the exhibition was to reassure the viewer that confusion is positive and welcome and encourages critical dialogue and thinking.

7. Shape and Motion Integration in People Perception Depends on the Action of the Performer

Presenter: Claire Honda, Psychology

Faculty Supporter: Dr. Nikolaus Troje

Perception of human action depends on both the body shape and motion of a performer. We can indirectly perceive the properties of an object being acted upon even when visual information is limited and the object itself is not visible; we accomplish this using internal models of a body's dynamics and an action's kinematics (Runeson & Frykholm, 1981). We are also sensitive to correlations between a performer's shape and motion, known as internal consistency (Runeson & Frykholm, 1983). To investigate how decorrelating shape and motion affects indirect object perception, we ran an experiment where participants watched realistic avatars of performers manipulating invisible objects. Unbeknownst to participants, half of the stimuli were internally inconsistent: the shape of one performer was combined with the motion of a performer with a dissimilar body shape. Participants saw sled pushes, beanbag throws, and box lifts, and estimated the sled weight, throw distance, or box weight. For sled pushes, there was a shape-motion interaction such that heavy bodies were perceived as pushing heavier weights when animated with motion from light performers, and light bodies were perceived as pushing lighter weights when animated with motion from heavy performers. In contrast, participants estimated beanbag throw distance primarily from performer motion. Interpretation of the box lift data is more complex. In conclusion, the way in which our visual system combines shape and motion information depends on the role of body shape and centre of mass on the outcome of an action.

8. Genome Guided Discovery of Chlorinated Natural Products in *Streptomyces curacoii*

Presenter: Stephanie Hrab, Chemistry

Faculty Supporter: Dr. David L. Zechel

Natural products derived from plants, animals, and microbes have long been a rich source of molecules that exhibit biological activity. Bacteria of the genus *Streptomyces* are one of the most important sources of natural products today, producing more than half of all known antibiotics. One class of natural products that have potent antibiotic activity are those that contain halogens. There are many examples

of halogenated natural products such as the antibiotics vancomycin and chloramphenicol. Incorporation of halogen atoms into drugs is a common strategy to enhance their bioactivity and specificity.

Rapid advances in DNA sequencing have led to genome mining approaches to discover new natural products. This technique can also be used to find bioactive halogenated products by analyzing the genomes for sequences encoding the 'halogenases' that are responsible for addition of the halogen.

One class of compounds that have biological activity against *Streptococcus pneumoniae*, *Staphylococcus aureus*, and *Staphylococcus epidermidis* are the desotamides. These compounds inhibit bacterial RNA polymerases. A cluster of genes that is likely responsible for the production this compound has been discovered in the *Streptomyces curacoii* genome; however this cluster is unique in that it also contains a halogenase gene. This study aims to discover a halogenated desotamide derivative from *Streptomyces curacoii* based on the genomic information. It is hypothesized that this derivative will have enhanced or new biological activity.

9. Piecing Together Monumental Sites of History

Presenter: Kelsey Jennings, Digital Humanities Undergraduate Research Assistant,
W.D. Jordan Special Collections Library

Faculty Supporter: Jillian Sparks, W.D. Jordan Special Collections Library

Uncovering some of the United Kingdoms most fascinating historical sites, this interactive digital website puts on display one of the newest collections in Queen's W.D. Jordan Special Collections Library. Using geospatial location technology and a variety of digital humanities concepts, the project undertook the task of mapping over 700 architectural guidebooks from across the United Kingdom. A key driving factor in the creation of the site was the challenge of making collections more accessible to students; encouraging the use of the wide range of the primary source material. The website conjoins the large guidebook collection with literature found in the Schulich-Woolf rare book collection. Through a thorough investigation of the existing literature in the library, this platform connects the plethora 20th-century guidebooks with the many rare 18th, 19th, and 20th-century antiquity books featured in the Schulich-Woolf collection. Through an accessible platform, students are now able to view the guidebook collection, while being able to access key resources for further research into key pieces of British history and identity.

10. What Are the Critical Elements in Safe School Legislation to Prevent Bullying?

Presenter: Linnea Kalchos, Concurrent Education/Global Development Studies and
History

Faculty Supporter: Wendy Craig

Research shows that effective school policies mean less bullying and a better school climate, but there is a limited understanding of the connection between evidence-based policy and the prevalence of bullying and victimization. The goal of this research is to determine if regional differences in policy and legislation are associated with the prevalence of bullying in Canada and the United States. Does policy predict differences at the regional level, as well as between countries? What are the critical elements within these policies and legislations that predict bullying and victimization?

This study used archival data from the Canadian sample of the 2013/2014 Health Behavior in School-Aged Children (HBSC) survey. 30,153 students from across Canada participated. Each legislation was coded based on a checklist reflecting best practices in the literature. High scores reflected a large

quantity of evidence based policy items. Mplus 7.3 was used for multilevel modeling, with MLR estimator to account for the non-normality of the bullying variables.

This study found there were national and regional differences in the evidence-base of bullying policies. There was a negative association between the comprehensiveness of a region's anti-bullying policy and the prevalence of bullying behaviour in that region. There is a negative relationship between the number of evidence based policy items in Canadian legislation and the prevalence of bullying and victimization. Further research is needed to explore the relationship between evidence-based policies and the prevalence of bullying and victimization over time.

11. What's in a Loaf? A Bio-accessibility Study of Toxic Elements in Gluten-free and Rye Breads and the Effect of Toasting Bread on the Bio-accessibility of those Elements Using ICP-MS

Presenter: Alastair Kierulf, Chemistry

Faculty Supporter: Dr. Diane Beauchemin

Bread is a staple in the North American diet with over 4 million tonnes consumed in the US annually. The popularity of breads made from alternative grains (such as rye, quinoa, and pumpernickel) and the increase in gluten free (GF) alternatives (made from a mixture of rice and other alternative grains) has significantly contributed to this growth[1] While the hunger for alternative breads is increasing, there is little research into the risks associated with consuming breads made from alternative grains. Studies[2] have shown that many grains can contain high levels of toxic elements, especially if they are grown in soils with high levels of these elements.

A previous study [3] investigated the risk associated with toxic elements in rice, and concluded that these elements are highly bio-accessible when the rice is not washed before processing. It is therefore extremely important to investigate the risk and bio-accessibility of toxic elements in these popular alternative breads.

Two different alternative breads were analyzed for their toxic element compositions, and the bio-accessibility of these elements was investigated. Results showed that the gluten free breads contained high concentrations of arsenic and selenium, and little to no levels of cadmium or lead. Rye bread, in comparison, contained little arsenic, cadmium, or selenium which was consistent with previous studies. Further work will investigate the effect of toasting and will also utilize an innovative online leaching method that significantly improves bio-accessibility results [3,4].

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12. Studying the effect of Heartfulness Meditation on Brain Activity

Presenters: Pallavi Gupta, Anirudh Kumar, Jahnvi Mundluru, Arth Patel, Shankar Pathmakanthan, Abdul Subhan

Faculty Supporter: Dr. Norman Farb, University of Toronto

Long-term meditation practice is increasingly recognized for its health benefits. Heartfulness meditation represents a quickly growing set of practices that is largely unstudied. Heartfulness is unique in that it is a meditation practice that focuses on the Heart. It helps individuals to connect to themselves and find inner peace. In order to deepen ones' meditation, the element of Yogic Energy ('pranahuti') is used as an aid during meditation. The purpose of this study was to determine whether consistent EEG effects of Heartfulness meditation be observed in sixty experienced Heartfulness meditators, each of whom attended 6 testing sessions. In each session, participants performed three conditions: a set of cognitive tasks, Heartfulness guided relaxation, and Heartfulness Meditation. Participants during the cognitive portion were required to answer questions that tested their logical thinking (Cognitive Reflective Test) and creative thinking skills. (Random Associative Test) The order of condition was randomly counter balanced across six sessions. It was hypothesized that Heartfulness meditation would bring increased alpha (8-12Hz) brain activity during meditation and better cognitive task scores in sessions where the tasks followed meditation. Heartfulness meditation produces a significant decrease in brain activity (as indexed by higher levels of alpha during the early stages of meditation. As the meditation progressed deep meditative state (as indexed by higher levels of delta) were observed until the end of the condition. This lead to the conclusion that Heartfulness Meditation produces a state that is clearly distinguishable from effortful problem solving.

13. FGF2 Gene is required for Antidepressant Treatment Effects

Presenter: Jessica MacGregor, Biology/Neuroscience, Carleton University

Faculty Supporter: Dr. Natalina Salmaso

Previous research has shown that fibroblast growth factor 2 protein can act as an anti-anxiety and anti-depressive agent in rodents. Furthermore, mutations in the FGF2 gene in humans have been shown to predict non-responsiveness to antidepressant drugs; suggesting that FGF2 is required for antidepressants to work. In this study, we hypothesized that antidepressants will not work in rodents that lack the FGF2 gene. Hence, we tested antidepressant treatment in transgenic mice that had the FGF2 gene knocked out. Chronic unpredictable stress (CUS) has been used for several decades to produce a reliable depressive and anxious phenotype in mice. This study followed a CUS paradigm and used fluoxetine (Prozac) as antidepressant treatment. Mice received daily fluoxetine administration beginning on week three of CUS and continued until the end of week five to provide an antidepressant effect and reverse the effects of stress. To test for levels of anxiety and depression, a battery of behavioral tests was conducted which began from the least stressful (i.e. sucrose preference test, open field maze, elevated plus maze) to the most stressful test (forced swim test) to prevent testing carry-over effects. AnyMaze software was used to measure behavior in the open field and elevated plus mazes by recording the amount of time each mouse spent in certain parts of the maze. Future studies will examine brain changes associated with FGF2 gene deletion – particularly in astrocyte cells – which might be necessary for successful antidepressant action. Hopefully, this will elucidate novel therapeutic targets for antidepressant and anti-anxiety medication.

14. Mapping, Curation, and Evolutionary Conservation of Macaque miRNA

Presenter: Mareena Mallory, Computing Science (Biomedical Computing)

Faculty Supporters: Neil Renwick and Kathrin Tyryshkin

MicroRNAs (miRNAs) are small regulatory RNA molecules that switch off gene expression. Their main function is to degrade or stop the translation of target messenger RNAs through binding to their 3' untranslated regions. miRNAs are excellent disease biomarkers due to their cell-type specificity, abundance, and stability. However, the sequences and locations of miRNAs within the human genome are a source of confusion in miRNA diagnostics. Here, I am defining the genomic locations and examining the specificity of miRNA expression in the Rhesus macaque tissues, using evolutionary conservation to guide our understanding of miRNA biology. First, I mapped the human miRNA precursor sequences in the macaque genome through the UCSC Genome Browser. Next, I expect to assess the validity of a miRNA by aligning macaque small RNA sequences against their corresponding precursor sequences. Lastly, I will calculate miRNA tissue specificity using existing data generated from 65 tissues obtained during a macaque necropsy. Through this approach, I expect to generate miRNA expression profiles using matching human miRNA expression profiles. These profiles were preprocessed through data normalization, outlier removal, and filtering of low expressed miRNAs. Feature selection and tissue specificity measures will be used to identify tissue-specific miRNA and an atlas of miRNA expression will be generated. miRNA conservation between humans and macaques will be assessed and macaque segments that did not align with the human genome will be investigated separately as they may be new miRNA.

15. The Comparative Toxicity of two Canadian Diluted Bitumens to Developing Yellow Perch (*Perca flavescens*)

Presenter: Denby McDonnell, Environmental Studies

Faculty Supporter: Dr. Valerie Langlois

Increasing demand for diluted bitumen (dilbit) has led to the development of the Alberta oil sands industry and the expansion of current and future transcontinental pipelines. However, the growth of oil transportation has led to public concern about the effects of potential dilbit spills to aquatic ecosystems. Although the toxic effects of crude oils through exposure to polycyclic aromatic hydrocarbons (PAH) are well characterized, little is known about the toxic effects of dilbit because of the variable proportions of diluent added to bitumen. Here we assessed the toxicity of the two most transported dilbits in Canada, Access Western Blend (AWB) and Cold Lake Blend (CLB) to developing yellow perch (*Perca flavescens*), a species distributed throughout North America. Embryos were exposed to dilbit until hatch, or up to 16 days, using a static daily renewal treatment regime of water accommodated fractions (WAF) and chemically-enhanced water accommodated fractions (CEWAF) of dilbit at total PAH (TPAH) concentration ranges of 0.02 to 10.7 µg/L and 0.21 to 20.4 µg/L TPAH, respectively. Results show that with increased TPAH concentration, the frequency of hatched embryos with developmental malformations increased proportionally. Expression of genes associated with phase I and II detoxification, cellular stress, and xenobiotic metabolism were altered in higher TPAH concentrations. This is the first study assessing the toxicity of both AWB and CLB dilbits on wild-sourced fish. With recent approvals of pipelines in North America, these biomarkers will assist risk assessments and monitoring of Canadian ecosystems should a pipeline spill occur.

16. Why has Classical Drama been Foundational for 172 Years at Queen's University?

Presenter: Anthea Morgan, Classics

Faculty Supervisor: Dr. Reeves

In 2015, Inquiry@Queen's opened with Classics students performing Aristophanes' *Lysistrata*, a 2500-year-old play illuminating themes of gender inequality and the victims of war which resound as strongly with modern audiences as they did with the ancient Greeks. Classical drama's continuing ability to resonate with contemporary audiences is one of reasons it has long been viewed as a foundational

component of a Humanities education. As a project for Queen's 175th anniversary, the presenter investigated how Classics and other units have incorporated classical drama into Queen's classes and post-curricular activities since the 1840s. In addition to ancient Greek and Roman plays, the study included plays with classical themes, and post-Classical plays staged by Classics students and professors. The methodology involved data collection from Queen's Archives, scholarly publications, and other relevant sources.

In this poster, I will provide examples to show how classical drama has been used at Queen's in relation to four main goals: its capacity in sustainability 'and' inclusivity; its value as a model for development of future cultures; its function as an active learning experience fostered by concentrated and contextualized classical study; and its ability to provide a cultural 'safe' space for participants with diverse needs to engage in examination of complex human problems. It is salient that classical drama has continued to be able to adapt to the changing needs of students and educators at Queen's for at least 172 years.

17. Covert Feminism: Female Activists on the Field of Play

Presenter: Clare Murphy, Kinesiology and Health Studies

Faculty Supporter: Dr. Mary Louise Adams

Because of feminist activism, what were once considered incompatible entities, women and sport, have come to be united within the social fabric of the 21st century. Recent generations of women are the first to experience sport as a commonplace reality that is largely taken for granted. After initial exclusion from the first and second wave feminist agendas, many activists now recognize sport as a vehicle for the advancement of women. The female athlete has been described by some academics as a type of "stealth feminist" who can support key feminist causes without arousing a knee-jerk social response. Although female sport participation and the status of female athletes have improved significantly, the impact this has had in the lived experience of women remains to be understood. This research project seeks to conduct focus groups with female athletes to better understand their relationship with the topic of feminism and to explore the impact sport participation has had within their lives. Deeper comprehension and documentation of sport from the perspective of female participants may not only serve to help guide sport policy and programming, but may also serve to foster a united, feminist consciousness that is capable of expanding the possibilities for female athletes and for women more broadly.

18. Sexual Self-Schemas and Neural Processing of Sexual Information in Women

Presenter: Stephanie M. Nanos, Psychology

Faculty Supporter: Meredith Chivers

Previous research suggests that humans respond differently to reproductively-relevant information in the environment, including heightened neural responses to sexual versus non-sexual cues. Limited research, however, has examined individual variation in the early neural processing of sexual information. Sexual self-schemas, or one's views of themselves as a sexual person, provide a stable cognitive framework for processing sexually-relevant information, and may relate to women's sexual responses. This study seeks to examine how women's sexual self-schemas relate to the early neural processing of sexual information and their subsequent subjective sexual arousal. Twenty women are being recruited from the Queen's psychology subject pool and data collection is currently underway. I am assessing women's neural responses to sexual and non-sexual images (i.e., erect penises versus elbows) using electroencephalography (EEG), and women are reporting their feelings of arousal to the sexual images. Women are also completing a measure of sexual self-schemas. I predict that women who have more positive sexual self-schema scores will have a stronger neural response to sexual stimuli than women with more negative schema scores. In addition, I predict that women with more positive schema scores will self-report higher sexual arousal than women with more negative scores. The findings of this study

will improve our understanding of the role of sexual self-schemas and early neural processing in women's sexual response, thus lending to the development of a comprehensive, empirically-supported model of sexual response that accounts for within-gender variability.

19. Navigating Sexual Health within a Desexualized Body: HIV/AIDS & Disability

Presenter: Emily Osborne, Gender Studies

Faculty Supporter: Dr. Scott Morgensen

This research explores commonly overlooked intersections of disability and HIV/AIDS, theorizing that institutional desexualization of disabled students in educational settings is correlated with higher rates of HIV transmission later in life. Working primarily within the fields of disability studies, HIV/AIDS studies, and gender studies, this project targets the gap in research on disability and HIV/AIDS, understanding disabled individuals as being at a heightened risk for HIV transmission yet simultaneously being less likely to receive sexual health education than non-disabled peers, as seen in emerging research by Nora Grace (2003; 2004). This research theorizes a relationship between institutional desexualization and HIV transmission later in life. Specifically, this relationship may exist in the following pattern, beginning with early and continued desexualization of disabled individuals leading to social assumptions of universal asexuality, thus potentially causing a lack of sexual health resources and education due to this assumed sexual inactivity. A lack of sexual health resources may influence higher rates of engagement in high-risk sexual activity due to this lack of sexual health knowledge among disabled individuals, which could thus account for higher rates of HIV transmission within disabled populations. In establishing disabled individuals as at heightened risk for HIV and disrupting the desexualization of disability, I provide recommendations for future research and policy pathways in the aim of further exploring the intersections of HIV/AIDS and disability in order to reduce the rates of HIV transmission within disabled population.

20. Physical Activity in Shift Workers versus Non-Shift Workers using Accelerometer

in Female Hospital Employees

Presenter: Romaisa Pervez, Kinesiology and Health Studies

Faculty Supporter: Dr. Ian Janssen

According to a recent Statistics Canada report on physical activity (PA) of Canadian Adults in 2007 to 2011, only 20% of adults (ages 18-79) are meeting the PA guideline. Although the reasons for physical inactivity are multifactorial it is likely that less leisure time due to an increase in work responsibilities may limit PA. Individuals who engage in shiftwork may have reduced opportunities to participate in leisure time PA due to fatigue associated with their irregular work schedule. Shiftwork has been associated with increased chronic disease risk, including cardiovascular, metabolic diseases and cancer. Changes in PA may be a biological mechanism by which shiftwork affects chronic disease development. As the prevalence of shiftwork continues to increase, it is important to understand the relationship between shiftwork and PA. A major limitation of studies that assess PA among shift workers is that it is often measured through self-report, which is an unreliable tool. Thus, the purpose of this study is to assess associations between shiftwork and objectively measured PA among shift workers. PA was measured in sample of 328 female healthcare workers. 160 of those participants were non-shift workers and 168 were shift workers. Participants were instructed to wear an accelerometer for seven consecutive days in order to retrieve results on the intensity (sedentary, light, moderate and vigorous) of PA each participant engaged in. The differences between PA in shift workers and non-shift workers were determined using ANCOVA and controlled for age as a covariate. With the staggering rates of chronic and metabolic diseases amongst shift workers, the identification of PA is crucial. Results can be used to guide PA interventions in this population.

21. Making the World a Colourful Place: Exploration of the Key Condensation Enzymes in the Biosynthesis of Prodiginines and Tambjamines

Presenter: Katherine Picott, Biochemistry

Faculty Supporter: Dr. Avena Ross

Bacteria produce many natural products that have useful bioactivities such as antibiotic, anticancer and antifungal effects. In bacteria, these molecules are made in a step-by-step process using proteins called enzymes that assist in building the molecule at each step of the process. This research is focusing on the biosynthesis of two classes of natural products called prodiginines and tambjamines. The molecules in each class have different structures but follow similar construction steps. Both processes first form the same common intermediate, then in the final step this intermediate is combined with another unique intermediate to make the final product. In this study, the enzyme that is involved in the final step of the process will be characterized for both prodiginine and tambjamine-type molecules. By purifying the enzymes for both types of molecule properties such as their catalytic mechanism, substrate flexibility, and structure can be determined and compared.

22. The Feminization of Agricultural Labour in India, With a Case Study of the Semi-Arid Region of Andhra Pradesh: A Means of Empowerment or a Method of Domination?

Presenter: Jamie Shinoff, Global Development Studies

Faculty Supporter: Dr. Marcus Taylor

With the general shift of men turning to out-migration work in times of economic disparity, women in rural India, specifically in the region of Andhra Pradesh, are forced to step in and fill the gap in agricultural labour left by migrating men. This phenomenon, coupled with the increased desire for female agricultural labourers – because of their tolerance of low wages – has led to a significant increase in the feminization of agricultural labour in India since the 1990s. While neoliberal writers argue that the increasingly feminized workforce of agricultural labour in rural India is largely demand-driven – both by male-out migration and thus the freeing up of agricultural work for women, I will argue, in accordance with the Marxist-feminist school of thought, that the increased feminization of agricultural labour in rural Andhra Pradesh does not reflect rural prosperity, but in fact is the “consequence of increasing pauperization among the small peasantry” (Garikipati 2008:630). This paper will explore the debate of whether or not the feminization of the agricultural workforce in rural Andhra Pradesh has accelerated female independence and empowerment in both the private (household) and public spheres. This locality study will thus add to a critical Marxist-feminist perspective of the feminization of agricultural labour in India generally, and the semi-arid region of Andhra Pradesh specifically, while raising the question of who truly benefits from the feminization of the agricultural workforce.

23. The Diniacopoulos Coin Collection at Queen’s

Presenter: Alysha Strongman, Classics

Faculty Supporter: Professor Cristiana Zaccagnino

Before moving to Canada, Vincent and Olga Diniacopoulos acquired a large collection of antiquities. After settling in Montreal, they continued their activity of art dealers and collectors. In 2001, Queen’s Department of Classics and the Art Conservation Program acquired a large number of ancient pieces from the collection, including 627 Greek and Roman coins from different periods, still to be treated and identified.

In my research project, I am currently working on cataloguing and identifying all of the coins in the collection. The coins in the collection are the best way for students to gain firsthand knowledge with artifacts from a research perspective.

The study of ancient coins is one of the traditional fields of Classical archaeology because of their imagery, frequently complex and intricate in spite of the small space available, their direct connection to figures and events of ancient history and their use for civic and dynastic propaganda.

The majority of the coins identified thus far appear to have been minted in Alexandria in Egypt, a country where the Diniacopoulos family lived for a while and acquired a large part of their collection. In my poster, I aim to present the project and to discuss a few coins that have been already identified.

24. Perspectives of Small-Scale Landlords on Providing Healthy Housing to Populations Living on Low Income: Results of an Ontario-Wide RentSafe Survey.

Presenter: Shaoyuan Wang and Rachel Hayton, Health Studies

Faculty Supporter: Dr. Jeffrey Masuda

Introduction: People living on low income often experience indoor environmental health risks. As team members of the provincially funded RentSafe initiative, our research explores the perspectives of small-scale landlords in Ontario on providing healthy housing to populations living on low income. Our objectives were to: 1) determine the perceived barriers to landlords providing healthy housing, 2) ascertain whether such barriers arise from socioeconomic precariousness among landlords, and 3) mobilize findings within RentSafe to ensure policy and practice responses can better accommodate landlord constraints and priorities.

Methods: During February 2017, a survey will be conducted on small-scale landlords living in Ontario. It will be distributed through the email list of the Landlord Self-Help Centre, a legal clinic that serves Ontario landlords. The survey design has been informed by landlord focus groups and a review of literature.

Results: Once data collection is complete, we will characterize the demographics of small-scale landlords who seek legal aid and analyze data on their attitudes, knowledge, and behaviour in relation to healthy housing. Furthermore, we will determine if socioeconomic precariousness exists among survey respondents and whether or not this impacts their ability to provide healthy housing.

Discussion: This work expands the breadth of RentSafe, and thus heightens its ability to pursue evidence-based strategies to promote healthy housing by bringing in landlord perspectives. Introducing landlord voices into the provincial conversation will shed light on opportunities for public health, government ministries, and other relevant stakeholders to better support small-scale landlords in providing healthy housing to low-income populations.

25. Identification of *De novo*, Deleterious Mutations through Exome Sequencing of Sporadic Autism Spectrum Disorder Trios

Presenter: Shalandra Wood, Biochemistry

Faculty Supporter: Dr. Xudong Liu

Autism Spectrum Disorder (ASD) is a prevalent neurodevelopmental disorder that has a strong genetic component consisting of many genes contributing to its cause. To help understand this complex genetic etiology, we are looking for novel genes that may be involved in the reason individuals develop ASD. We

are doing this by using 5 sporadic ASD cases to determine *de novo* mutations (mutations new to the affected child that are not previously found in the family). These sporadic cases ensure that the disorder is not likely to arise through any inherited mutations, but through a new mutation found solely in the affected child. We use a trio analysis in which the genes of the affected child are compared to those of their mother and father, so pure *de novo* single nucleotide polymorphisms (SNPs) can be determined. These SNPs are then filtered based on predicted deleterious effect, quality and biological relevance. Using whole-exome sequencing on these 5 sporadic trios numerous deleterious, *de novo* mutations have been determined. These are being reviewed for biological relevance, and will be validated using Sanger Sequencing. Of these proposed SNPs being validated a few, such as *SHANK3* and *DVL1*, have previously been linked to ASD. Whereas others, such as *C11orf31*, are novel candidate genes for the disorder. Through this experiment our understanding of the genetic etiology of ASD continues to grow and evolve, leading to greater insight into this disorder and new directions for possible treatments.

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