Inquiry@Queen's

13th
Annual
Undergraduate
Research Conference

Program

March 7 & 8, 2019
Queen's Learning Commons
Stauffer Library

queensu.ca/iatq

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March 2019

We are now in our 13th 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. We are excited to have student researchers from Carleton University this year.

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 thirteen years...we thank you! Congratulations to all participants!

On behalf of Inquiry@Queen's,

Vicki Remenda
Head, Department of Geological Sciences & Geological Engineering
Faculty of Arts and Science

Jackie Druery
Head Humanities & Social Sciences Librarian
Queen's University Library

Patrick Patterson
Reference Assistant
William Lederman Law Library/Information Services

Catherine DeNoble
Reference Assistant
Education Library/Information Services

We recognize that Queen's University is situated on traditional Anishinaabe and Haudenosaunee Territory.

Thursday, March 7, 2019

9:15-9:30   Coffee (Speaker's Corner, Stauffer Library)

9:30   Session I: Innovation Improving our Health & Lives (Speaker's Corner)

9:30   Session II: Where are the Boundaries? (Seminar Room,Stauffer Library, Room 121)

11:30-1:00 Session III: Pizza with Poster Presenters (Seminar Room) All Welcome!

1:00   Session IV: Diversity, Inclusion, Complexity I (Speaker's Corner)

1:30   Session V: Power & Resistance (Seminar Room)

Friday, March 8, 2019

10:15   Coffee (Speaker's Corner, Stauffer Library)

10:30   Session VI: Ways of Being Chinese-Canadian: Carrianne Leung's *The Wondrous Woo* Panel (Speaker' Corner)

1:15   Session VII: Diversity, Inclusion, Complexity II (Speaker's Corner)

1:00   Session VIII: New Frontiers (Seminar Room, Stauffer Library, Room 121)

ORAL PRESENTATIONS

Speaker's Corner, Stauffer Library
Thursday, March 7, 9:30-11:30
Moderator: Vicki Remenda, Geological Sciences and Geological Engineering

Sitting through life? Psychosocial Antecedents of Sedentary Behaviour in a Post-Secondary Setting

Presenter: Sophie Calderhead, Health Studies, School of Kinesiology and Health Studies
Faculty Supporter: Dr. Jennifer Tomasone and Madelaine Gierc

Currently, there is a paucity of research on the psychosocial antecedents of sedentary behaviour (SB) in a post-secondary setting. Theory of Planned Behaviour (TPB) constructs may influence sedentary behaviour amongst students. Further, normative messages may be one tool for altering perceptions of sedentary behaviour. However, the effect of descriptive norm messages on sedentary behaviour is currently unknown. The primary purpose of this study is to examine students' perceptions of sedentary behaviour; the secondary purpose is to investigate whether the receipt of a normative message is an efficacious tool for reducing students' sedentary behaviour. Post-secondary students will complete an online questionnaire and will randomly receive an injunctive norm, descriptive norm, or control sedentary behaviour message. The questionnaire will measure demographics, TPB constructs, and self-reported SB. One week later, they will complete the same questionnaire. Multiple regression and ANOVAs will be used to address the two study purposes, respectively. Results may inform future interventions aimed at decreasing students' sedentary behaviour levels

Analysis of colon curvatures toward optimizing colonoscopy examinations

Presenter: Jacob Laframboise, Laboratory for Percutaneous Surgery, School of Computing
Co-authors: Keiran Barr, Tamas Ungi, Pearl Tan, Lawrence Hookey
Faculty Supporter: Dr. Gabor Fichtinger

Purpose: Colonoscopy is a complex procedure with considerable variation among patients, requiring years of experience to become proficient. Understanding the curvature of colons could enable practitioners to be more effective. The purpose of this research is to develop methods to analyze the curvature of patients' colons, and compare key segments of colons between supine and prone positions.

Methods: The colon lumen in CT scans of 42 patients were segmented. The following steps were automated by Python scripts in the 3D Slicer application: a set of center points along the colon were generated, and a curve was fit to those points. By identifying local maximums and local minimums in curvature, curves were defined between two local curvature minimums. The angle of each curve was calculated over the distance of curves.

Results: This process was used to identify and analyze curves on the colon centerline in different patient positions. On average, there are 32.63 ± 0.83 curves in supine position and 31.24 ± 0.80 in prone. In the supine position the curves turn an average of 77.80 ± 2.25 degrees, and 75.88 ± 1.87 degrees in prone. Graphically, there are observable differences between positions for curves of specific magnitudes.

Conclusion: This process can quantify the curvature of colons, and could be adapted to consider other patient groups. Descriptive statistics indicate supine position has more curves in the descending colon,

and prone has sharper curves in the descending colon. These preliminary results motivate further work with a larger sample size for statistical analysis, which may reveal significant differences.

Assessing the binding affinity of a small molecule for the c-Myc oncogene guanine quadruplex for targeted anticancer applications
Presenter: Yushi Liang, Chemistry
Faculty Supporters: Dr. Anne Petitjean

Cancer is a group of diseases defined by abnormal cell growth that can invade different tissues and is caused by mutations to certain genes leading to uncontrolled cellular proliferation.[1] Found in all cells, deoxyribonucleic acid (DNA) encodes through five bases the genes needed to make every protein in the body. Aside from its conventional double helical structure, DNA can form higher-order architectures called guanine quadruplexes (G4s). G4s are composed of planar tetrads of four hydrogen-bonded guanines stabilized by a central cation that help limit the expression of cancer-related genes (Figure 1).[2] c-Myc is a gene that is overexpressed in the majority of human cancers.[3] Overexpression of c-Myc upregulates cellular growth and metabolism pathways central to cancer.[3] The region of the c-Myc gene that controls its expression ('promoter region') can fold into a G4.[4] Enforcing the folding of the c-Myc promoter into a G4 using small molecules can prevent c-Myc expression leading to cancer. Two years ago, the Petitjean Group made an exciting discovery of a binder which showed uniquely high affinity for G4s, while not associating with duplex DNA.[5] In my research presented here, I am using the fluorescence indicator displacement assay to indirectly assess binding constants and determine the degree of stabilization this binder offered to the c-Myc G4. Knowing the stabilization offered by this binder to c-Myc G4 can allow further research into a second generation of binders for targeted anticancer applications.
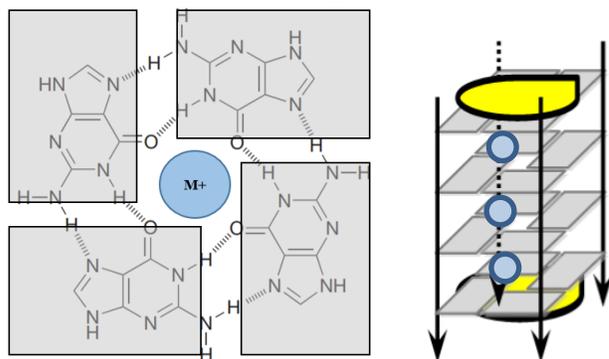

Figure 1. Planar tetrads of hydrogen-bonded guanines (left) stacked to form a G4 (right). G4-selective binder (yellow).

References
[1] Miller, D. M.; Thomas, S. D.; Islam, A.; Muench, D.; Sedoris, K. *Clin. Canc. Res.* 2013, *18*, 5546-5553.
[2] Ruggiero, E.; Richter, S. N. *Nucleic Acids Res*. 2018, *46*, 3270-3283.
[3] Brooks, T. A.; Hurley, L. H. *Genes Cancer.* 2010, *6*, 641-649.
[4] You, H.; Wu, J.; Shao, F.; Yan, J. *J. Am. Chem. Soc.* 2015, 7, 2424-2427.
[5] a) Caitlin E. Miron, PhD Thesis, Queen's University, 2018; b) C. E. Miron, J.-L. Mergny, A. Petitjean, *Platinum Compounds for Binding Guanine Quadruplexes*, PCT/C2018/051399.

Use of Convolutional Neural Network for Fully Automated Segmentation of Hard Exudates in Retinal Images
Presenter: Aidan Lochbihler , Computer Systems Engineering, Carleton University
Faculty Supporter: Dr. Eranga Ukwatta

Diabetic retinopathy (DR), is a complication with diabetes caused by damaged blood vessels in the back of the retina. DR affects 126.6 million people around the world and is the leading cause of blindness. Hard exudates are a type of lesion caused by the damaged blood vessels and are an early marker for DR. In this research, a fully automatic deep learning method has been developed that is able to delineate hard exudate lesions in retinal images. This allows the lesion volume to be calculated and thus determine DR severity. This technology would remove the need for doctors in the diagnosis process, therefore making the diagnosis faster and more accessible to people around the world. Our dataset consisted of 58 images and was used to train a fully convolutional neural network with a U-net architecture. The U-net consists of a contracting path followed by a symmetric expansive path that was used to learn features of the images. These features were then used to differentiate hard exudates from regular tissue allowing them to be segmented. After creating the model 26 images were used for testing. Results of the U-net model showed a Dice similarity coefficient of $67.23 \pm 13.60\%$, a specificity of $99.74 \pm 0.25\%$, and precision of $75.87 \pm 18.14\%$ when comparing the algorithm generated images to the manually segmented ground truths. These results show that the model is precisely delineating the hard exudates and therefore is a viable way to diagnose the severity of DR.

Validation of a low-cost adjustable, handheld needle guide for spine interventions
Presenter: Julia Wiercigroch, Mathematics and Engineering
Faculty Supporter: Dr. Gabor Fichtinger

Purpose: MR-guided injections are safer for the patient and the physician than CT-guided interventions but require a significant amount of hand-eye coordination and mental registration by the physician. We propose a low-cost, adjustable, handheld guide to assist the operator in aligning the needle in the correct orientation for the injection.

Methods: The operator adjusts the guide to the desired insertion angle as determined by an MRI image. Next, the operator aligns the guide in the image plane using the horizontal laser and level gradient. The needle is inserted into the sleeve of the guide and inserted into the patient. To evaluate the method, two operators inserted 5 needles in two facet joints of a lumbar spine phantom. Insertion points, final points and trajectory angles were compared to the projected needle trajectory using an electromagnetic tracking system.

Results: On their first attempt, operators were able to insert the needle into the facet joint 85% of the time. On average, operators had an insertion point error of 2.92 ± 1.57 mm, a target point error of 3.39 ± 2.28 mm, and a trajectory error of 3.98 ± 2.09 degrees.

Conclusion: A low-cost, adjustable, handheld guide was developed to assist in correctly positioning a needle in MR-guided needle interventions. The guide is as accurate as other needle placement assistance mechanisms, including the biplane laser guides and image overlay devices when used in lumbar facet joint injections in phantoms.

Using Convolutional Neural Networks for the Detection of Spinal Transverse Processes

Presenter: Victoria Wu, Computer Science
Faculty Supporters: Dr. Tamas Ungi and Dr. Gabor Fichtinger

Introduction: Scoliosis, an excessive curvature of the spine, affects approximately 1 in 1,000 individuals. As a result, there have formerly been implementations of mandatory scoliosis screening procedures. Screening programs are no longer widely used as the harms often outweigh the benefits; it causes many adolescents to undergo frequent diagnosis X-ray procedure. This makes spinal ultrasounds an ideal substitute for scoliosis screening in patients, as it does not expose them to those levels of radiation.
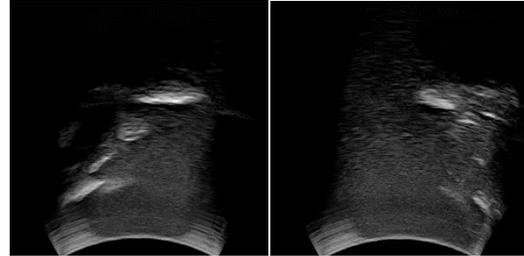

Figure 1: Ultrasound scan containing a transverse process (left), and ultrasound scan containing no transverse process (right)

Spinal curvatures can be accurately computed from the location of spinal transverse processes, by measuring the vertebral angle from a reference line [1]. However, ultrasound images are less clear than x-ray images, making it difficult to identify the spinal processes. To overcome this, we employ deep learning using a convolutional neural network, which is a powerful tool for computer vision and image classification [2].

Method: A total of 2,752 ultrasound images were recorded from a spine phantom to train a convolutional neural network. Subsequently, we took another recording of 747 images to be used for testing. All the ultrasound images from the scans were then segmented manually, using the 3D Slicer (www.slicer.org) software. Next, the dataset was fed through a convolutional neural network. The network used was a

Figure 2: Accuracy of classification for training (red) and validation (blue)

modified version of GoogLeNet (Inception v1), with 2 linearly stacked inception models. This network was chosen because it provided a balance between accurate performance, and time efficient computations.
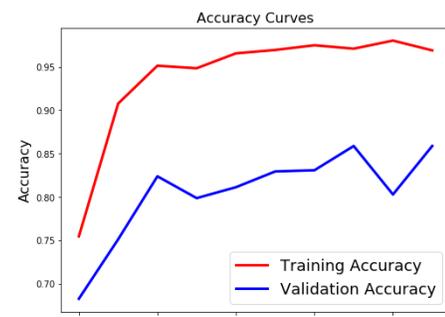
Results: Deep learning classification using the Inception model achieved an accuracy of 84% for the phantom scan.

Conclusion: The classification model performs with considerable accuracy. Better accuracy needs to be achieved, possibly with more available data and improvements in the classification model.

References:
[1]   Ungi T, King F, Kempston M, Keri Z, Lasso A, Mousavi P, Rudan J, Borschneck DP, Fichtinger G. Spinal Curvature Measurement by Tracked Ultrasound Snapshots. Ultrasound in Medicine and Biology, 40(2):447-54, Feb 2014.
[2]   Krizhevsky A, Sutskeyer I, Hinton GE. (2012). ImageNet Classification with Deep Convolutional Neural Networks. Advances in Neural Information Processing Systems 25:1097-1105.

Seminar Room, Stauffer Library, Room 121
Thursday, March 7, 9:30-10:50
Moderator: Graeme Campbell, Academic Director, Queen's Research Data Centre &
Open Government Librarian

Playing Games of Dress-Up During the Italian Renaissance
Presenter: Maddi Andrews, Art History
Faculty Supporter: Dr. Una D'Elia

Throughout the Renaissance, people would dress sculptures of the Virgin during sacred ceremonies, adorn sculptures of the Madonna and Child with jewels, and swaddle sculptures of the infant Christ. Agostino di Giovanni's *Annunciate Virgin* (1321) [Fig. 1] reflects the popular tradition of dressing sculptures in Tuscany during the Trecento and Quattrocento. Agostino di Giovanni carved the *Annunciate Virgin* wearing only a red underdress, as this sculpture was originally dressed in an actual fabric mantle and veil. The moveable joints in her elbows and shoulders facilitated dressing. The Virgin reflects the idealized beauty standards of the period, with full cheeks, almond-shaped eyes, a small pointed nose, and delicate rosebud lips. During the Trecento and Quattrocento, dressing sculptures were popular, and worshipers likely engaged in the act of dressing as a form of devotion. Her youthful beauty, and the fact that worshipers dressed her, raise issues of decorum, especially considering that the act of dressing implies undressing. These tensions are reflected in later accounts of priests dressing sculptures of the Virgin Mary using poles and under the supervision of pious women. Given that worshipers dressed this sculpture in actual fabric, how did the *Annunciate Virgin* balance humanity and divinity, thus mitigating these concerns of modesty? This research paper explores this question using the visual reconstruction of the *Annunciate Virgin*, which recreates the original physical and social context of the sculpture [Figs. 2 –3].

(from left) Figure 1.
Annunciate Virgin by Agostino di Giovanni
1321

Figure 2.
Annunciate Virgin Reconstruction

Figure 3.
Reconstruction

Setting Boundaries: Lessons on When to Not Make Theatre
Presenter: Allie Fenwick, Drama-Gender Studies and Concurrent Education
Faculty Supporter: Dr. Jenn Stephenson

A common thread throughout much of Canada's current theatrical output is that it asks audiences to think deeply about themselves and their connection to the material. Working with the idea that theatre has an important social and educational impact, my essay examines the need to set boundaries for theatre content. These boundaries are meant to function as a set of guidelines for managing controversial artistic choices, especially in a culture where artistic freedom and productive controversy are at stake. Some of the criteria I have developed for how to set boundaries include: how the work represents its subjects; what Canadians see as taboo; personal limitations individuals set for themselves; and, contentious timing. My research examines recent case studies, starting with Robert Lepage's *Kanata*, which aimed to discuss Canada's settler history, however, was cancelled in Canada after Indigenous artists and activists wrote an open letter concerning the lack of Indigenous presence in the cast and production team. I then move to an example that challenges my proposed model with *Prom Queen: The Musical,* a play about an Ontario student and his boyfriend battling the Catholic school board to go to prom together. I argue that although the play may not represent the values of the school board, adequate representation of the board's ideals should be disregarded due to their anti-LGBTQ2+ beliefs. Through these examples and more, my research found that there are certain boundaries that should not be crossed in theatre. However, determining where these boundaries are situated remains in constant negotiation.

Debating the Supreme Court of Canada's Role in Governing Minority Groups with the Charter
Presenter: Jiaxi (Jessie) Han, Department of Political Studies
Faculty Supporter: Dr. Adrienne Davidson

The Canadian Charter of Rights and Freedoms empowers the Supreme Court to interpret and uphold values entrenched in the Constitution by giving it the responsibility to review legislative and executive actions, and invalidate them in case of non-compliance. While scholars have noted the growing influence of the Court's judicial power on policy outcomes, its supporters argue that a robust interpretation of rights protects citizens to be treated equally in order to participate in democratic politics; on the other hand, its critics suspect how judicial reviews could avoid interfering with the will of people, which is expressed through elected representatives in other branches of the government. Despite such disagreement, most scholars think the Charter creates new constitutional actors in the form of ethnic minorities, and therefore makes balancing between different interests especially difficult and controversial.

My paper picks up on this debate in the scholarly literature to argue that the Court often tends to place a greater emphasis on equality over liberty when interpreting the Charter, and some freedoms cannot be achieved without the government actively promotes them through direct intervention. To develop this argument, I examine how the changes in relationship between Canadian government and minority groups impose challenges in governing the country as a result of the Charter. In particular, I focus on cases involving religious and language minorities to illustrate how the Court attempts to solve the legal puzzle following secular and egalitarian principles.

The Marquis de Sade & the Power of Eroticism
Presenter: Hasti Pourriahi, Psychology
Faculty Supporter: Dr. Jacqueline Davies

With increasing levels of consensus that sexuality is an important site of social diversity, we are gaining more insight into the detrimental social and psychological effects of sexual repression. Yet, sex continues to be a site shaped by taboo. Personal liberation seems to call for taboobreakers. With that, I ask whether there is anything liberating to learn from the life and work of one of the most notorious violators of sexual and other social mores. I consider the case of the Marquis de Sade (1740-1814). His writing and libertine philosophies were critical of the Catholic Church at a time when dissent was rising. But what made him so radical? Was he merely perceived as a threat by those wanting to protect their power? Or is there something more radically threatening and potentially liberating in his libertinism? What is it about the power of eroticism that makes it so threatening? Can this power be utilized as a tool for empowerment in the context of contemporary social justice struggles, or is it simply violence? I examine how de Sade's work contributed to a radical counterargument against dominant sexually repressive mores. I conclude with critical remarks and provocative questions about the legacy of his work, which is no less relevant today than it has ever been.

Session III: Pizza with Posters
Atrium, Stauffer Library
Thursday, March 7, 11:30-1:00
See poster abstracts beginning on page 23

Session IV: Diversity, Inclusion, Complexity I
Speaker's Corner, Stauffer Library
Thursday, March 7, 1:00-2:40
Moderator: Cory Laverty, Teaching & Learning Specialist, Centre for Teaching & Learning

Digitally Mapping the Poetry and Correspondence of Amelia Opie
Presenter: Naomi Chernos, English
Faculty Supporter: Dr. Shelley King and John Pierce

Amelia Opie was a Romantic era writer, engaged in revolutionary politics, who in midlife, became a devout Quaker, and gave up the publishing of fiction. Many scholars and contemporaries of Opie have commented on her sudden religious conversion, and suggested that Opie was engaged in a complicated "conscious struggle to mediate an identity which could include both her talents as a writer and her personal faith ("Introduction" LII). The Quaker faith had strict rules against the publishing of fiction, and a Quaker should never be engaged in creative authorship. Consequently, Opie's poetry written after her turn to Quakerism forms an interesting area, and raises questions about her negotiation of artistic and religious identities. Digital methods of statistical analysis were used to examine the shifts in her poetry personal correspondence, particularly with regards to Opie's attitudes towards mourning and religious faith were examined. Indications were that Opie used religion as consolation in her elegies as well as her life. However, a closer examination of her poetry and letters reveal that Opie was somewhat uneasy with her reliance on Christian faith, negotiating between that and her worldly concerns, rather than being wholly comforted by God. In the case of her father Opie found her faith to be inadequate, showing that only a whole acceptance allows for proper mourning. Although a digital analysis indicates that Opie used her faith

as consolation for suffering, a closer reading suggests that this process was complex that her faith was ultimately unable to provide an adequate substitute.

Understanding Children's Perspectives on the Definitions and Importance of Play
Presenter: Dayna Goldfarb, Child Studies, Institute of Interdisciplinary Studies, Carleton University
Faculty Supporter: Monica Patterson, Institute of Interdisciplinary Studies

Ideas about children and play are socially constructed by hegemonic societal values, beliefs, and institutions. Research engages with children's play in ways that are constructed and reinforced by adults. Therefore, it is important to deconstruct dominant discourses about play because they are used to maintain adult-dominated power stratification and enforce normative beliefs. This study aims to understand how children define, conceptualize, and operationalize play in ways that may diverge from adult assumptions. Focusing on 6-9 year olds in a mid-sized Canadian city, it makes an important contribution to the field, which is overwhelming based on studies conducted in the United States. This study uses a drawing analysis to elicit children's perspectives, which are frequently ignored in adult-centric research. Five to ten children will be recruited from an afterschool program. The children will draw pictures of themselves playing and be interviewed about their drawings. The results will be interpreted within the paradigms of the new sociology of childhood and playwork. These theories acknowledge the socially constructed nature of children and play, engage with children's agency, and address the power dynamics that govern adult-child relations. This study does not aim to make predictable or generalizable findings. Instead, this study focuses on eliciting and expressing the opinions and worldviews of the children who participate. Expected results are that children conceptualize play in non-traditional ways that adults do not consider.

The Allegiance of Vladislav Felitisianovich: The Jewishness of Khodasevich's Nekropol understanding his views towards Russian Emigre literature
Presenters: Henry Y. Jeong, History and Classics
Faculty Supporters: Dr. Ana Siljak, History; Dr. Vassili Schedrin, History and Jewish Studies

The purpose of this presentation is to examine how Vladislav Khodasevich establishes his cosmopolitan position on the future of Russian Emigre literature in his final work Nekropol (1939). I aim to focus particularly on how his internal display of Jewishness in Nekropol serves as a critical mode to understand his cosmopolitan views towards art creation. Khodasevich, in his homage to his closest literary companions Samuil Kissin (Muni) and Mikhail Gershenzon, firmly demonstrates how Khodasevich's cosmopolitan, rigorous views towards art creation were established through his Inorodtsy as a Polish Jew in Moscow, the use of Muni's tragic death as a form of art creation through his use of trauma, and his tribute to universally-loved Gershenzon in instiling Khodasevich the necessity of artistic philosophies and public involvement in literary survival. With the combination of the factors above, Khodasevich's views on artistic creation are completed during his emigre years, having his positive, rigorous approach to the future of Russian Emigre literature beyond its Oblomovism-like state during 1930s France. By allowing his readers an under-the-depth understanding of factors that developed Khodasevich's cosmopolitan stances in Nekropol, Khodasevich's tribute demonstrates the importance of linking the world of historical fields within Slavic studies, allowing a multidimensional understanding of both Jewish history and Russian literature in both Silver Age and under emigration.

Donkey Kong Country (1994)'s Use of Progressive Rock Style
Presenter: Brooke Spencer, Music
Faculty Supporter: Dr. Stephanie Lind, Dan School of Drama & Music

Whereas most of Nintendo's music from the 1990s used basic looping structure and simple chiptune-reminiscent sounds, Donkey Kong Country (1994), composed by British composer David Wise rather than by Nintendo's in-house composition team, featured texturally more complex music, including features characteristic of the 1970s/80s progressive rock style such as short repeated melodies and chord progressions with layering (Collins 44).

For example, in "Fear Factory" (Figure 1), we hear a repeated chord progression of (VI, iv, i) underneath a faster eighth-note melody. Very little harmonic movement occurs and the focus is more on the melodic layers that occur in this top voice. In addition, "Fear Factory" includes unconventional punk, "mechanic/industrial", and "glitch" noises that emphasize melodic content (https://www.youtube.com/watch?v=v18pEFQb3EM&t=45s). As William Cheng discusses in Sound Play, the use of such unconventional sounds often contribute to a feeling of dissociation and alienation in the player, and create a divide between diegetic (that is, music the characters are aware of) and non-diegetic (that is, "background" music) soundscapes (Cheng 98-9). While this is not a direct element of prog-rock, both industrial and prog-rock music styles feature a strong focus on texture. Collins speculates that this may have been an attempt by Nintendo to capitalize on the 'edgier' market of other game producers such as Sega (Collins 46).

In this paper, an analysis of form, melodic structure, and instrumentation from Donkey Kong Country's "Treetop Rock" and "Fear Factory" will demonstrate features atypical of Nintendo style, which normally features catchy tunes, simple instrumentation, and pop-inspired harmonies.

Figure 1:

e-:   VI   iv   i   VI   iv

Bibliography
Cheng, William. Sound Play: Video Games and the Musical Imagination. The Oxford Music/media
Series. Oxford: Oxford University Press, 2014.

Collins, Karen. Game Sound an Introduction to the History, and Practice of Video Game Music and
Sound Design. Cambridge: MIT Press, 2008.

Making Meaning Count: A Phenomenological Approach to Understanding Student Meaning-Making Processes and Academic Outcomes
Presenter: Laura Tang, Sociology

The income-gap between Canadian families has widened in recent years. Students from low-income households often start their educational careers behind their peers. This gap in educational attainment and

advantage often follows them throughout the duration of their educational development (Davies and Guppy 2010. While these systemic inequalities continue to perpetuate social processes resulting in the limitations of student capabilities, this paper works towards establishing a phenomenological lens which may be used to mitigate the disparity in the academic performance of students from low-income households compared to those of their peers – in particular, the ways in which poverty impacts self-concept and, ensuingly, academic performance amongst students. To establish this framework, this paper explores three key phenomenological concepts: the life-world, the theory of embodiment, and the Husserlian concept of intentionality.

References:
Davies, S., & Guppy, N. (2010). The schooled society: An introduction to the sociology of education. Oxford University Press. 198 Madison Avenue, New York, NY 10016

Session V: Power and Resistance
Seminar Room, Stauffer Library, Room 121
Thursday, March 7, 1:30 -3:30
Moderator: Jacqueline Davies, Philosophy

The Debate on Gun-Control: Is it Rationally Reconcilable?
Presenter: Serena (Ai Nuo) Geng, Philosophy, Psychology, and Con-Ed.
Faculty Supporter: Dr. Benjamin Martin

This presentation will begin by looking at the concept of deep disagreements and how it relates to the current debate on gun-control in America. Deep disagreements occur when people do not share the same underlying assumptions as coined by Fogelin (1985). Next, I will examine the issue of gun-control through the two main arguments of the pro-gun party: that guns make America a safer place and that the U.S. Constitution grants American citizens the right to bear arms. I will then offer anti-gun arguments against these claims as well as independent anti-gun claims in an attempt to rationally reconcile the two sides. Lastly, I will conclude with the assertion that the debate on gun-control is in fact rationally reconcilable.

Embodying Resistance: Power as Internal Resistance in Fanon's *Black Skin, White Masks*
Presenter: Trevell Hamilton, Philosophy
Faculty Supporter: Dr. Jacqueline Davies

Commonplace definitions of resistance define it as specific form of *political* resistance; as a process in which individuals' band together in hopes of resisting a particular structure and achieving a common goal – but Fanon differs in this regard. For Fanon, resistance must be a twofold project: before individuals deploy higher-order methods of resistance, such as social and political resistance, he urges us, by way of demonstration, to adopt methods of *internal* resistance. Therefore, a philosophy of resistance must not only manifest itself in social and political practices; it must also serve as an *embodied* philosophy that individuals adopt in their everyday lives.

Thus, my intention here is to investigate notions of power and resistance within Frantz Fanon's *Black Skin, White Masks*. More specifically, I seek to show that in *Black Skin, White Masks* Fanon's conceives of those bearing power as having the capacity to resist – a capacity that is derived from *within*. Power, then, can manifest itself as a form of self-motivated, embodied resistance towards systems and structures that impact

an individual's internal disposition – their beliefs, lenses, and psychological temperament.

However, in order to develop an account of self-motivated, embodied resistance, we also need to develop the proper philosophical tools that can be used to draw the boundaries between power and dominance, to combat the possibility of *false* self-motivation, and to provide a working definition of self-motivation, embodiment, and resistance.

Understanding the Global Trade of Second-Hand Clothing by Analyzing Used Clothing Donor Perceptions in Ottawa
Presenter: Tayler Hernandez, Bachelor of Global and International Studies, Faculty of Public Affairs at Carleton University
Faculty Supporter: Marylynn Steckley

The second-hand clothing commodity chain is a global, multi-billion dollar trading network which has been growing steadily since the early 1990s. Used clothing tends to be exported from high-income countries, like Canada, to low-income countries around the world, undermining local apparel industries, livelihoods, and environments. Despite this, North Americans are often ethically motivated to donate; framing their donations within humanitarian and environmental aspirations. In other words, there is a disjuncture between the perceptions of used clothing donors, and the livelihood and environmental impacts on the ground in receiving countries. I take an action-research approach to explore and address this tension, and my work is guided by the question: how do donors of used clothing view their role within the second-hand clothing commodity chain and how does this impact their clothing donation behaviour? I draw from semi-structured interviews (n = 20) with students at Carleton University in Ottawa, Ontario, who have donated used clothing at least four times within the past two years. Young Canadians are an important study group because they are still developing donation habits. In particular, university students can help shape the future of the second-hand clothing industry. I am confident that by improving environmental education and making students aware of the ecological and livelihood impacts of used clothing donation, my action-research approach not only has the potential to impact life-long behavioural change of participants but will uncover creative alternatives for Canada to develop a second-hand clothing industry that is more environmentally viable and socially ethical.

Droning Discourse: Remotely Piloted Systems and the Masculine Predator State
Presenter: Bibi Imre-Millei, Department of Political Studies
Faculty Supporter: Dr. Kim Richard Nossal

How is gendered language utilised to position the United States in relation to target states to morally justify Remotely Piloted Aircraft (RPA) strikes? State discourse of the US during the George W. Bush and Barrack Obama administrations projected an image of remotely piloted systems as mechanisms of masculine protection. US officials assert that RPAs not only protected Americans at home, they protected populations vulnerable to terrorist attack abroad. While the RPA itself was coded as masculine, RPA pilots are feminised because they are protected from battle while using the RPA. The RPA takes the position of the ultimate masculine protector and its operators become feminised in US rhetoric. The surveillant assemblage of pilot, RPA, and sensor-analytics systems sustaining the RPA, is examined through a rigorous discourse analysis of state officials' statements during the Bush and Obama administrations. Statements are taken from a number of reputable publications including The New York Times, The New Yorker, The Atlantic, Al Jazeera, CNN, and BCC, among others. Statements are also taken from the report "Living Under Drones," from the law schools of Stanford and New York University. This research begins to answer the question of how technology is gendered in relation to RPAs and RPA strikes.

Classical Reception Among the Women of the Eighteenth-Century Bluestocking Society
Presenter: Raphaelle Walsh-Beauchamp, Classical Studies
Faculty Supporter: Dr. Cristiana Zaccagnino

Eighteenth-century Britain saw a rich period of classical reception and allusions to antiquity in its literature, art, and politics. Among those who were influenced by the ancient Greek and Roman cultures were the members of the Bluestocking Society. Comprising mainly of authors, artists, and politicians of the elite class, it is its female members who have gained the most prominence in the subsequent study of the Society. While its most famous female members have been extensively studied through feminist, political, and literary lenses this work seeks to examine the classical influences upon the group. This paper will examine a mixture of contemporary literary works, paintings, engravings, and commissioned architecture, analyzing the classical allusions within these works and how these were used by the Bluestocking women to propagate their social standing. Additionally, the education of the Bluestocking women will be examined to see how certain women of the eighteenth-century made use of informal systems of learning to become as affluent in classical scholarship as their male counterparts. The Bluestocking women were able to use this informal education to become celebrated scholars. Major works analyzed within the paper include the personal letters of the leader of the Bluestockings Elizabeth Montagu, Sarah Fielding's *The Lives of Cleopatra and Octavia* (1757), *Portraits in the Characters of the Muses in the Temple of Apollo* (1778) by artist Richard Samuel, and representations of historian Catharine Macaulay as a Roman figure.

A Sociocultural Exploration of Sex-Bias in NSERC-funded Human Cardiovascular Research at Ontario Universities
Presenter: Ria Wilson, Kinesiology and Health Studies
Faculty Supporter: Dr. Kyra Pyke, Dr. Mary Louise Adams

It is well established that sex-bias against the inclusion of women exists in human cardiovascular research, where women have been excluded from or under-represented in the research process, despite the high prevalence of cardiovascular disease among this population. To address the sex-bias against the inclusion of women in federally-funded research, including research funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant (DG) program, the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans was introduced in 2010. However, despite the introduction of this policy, it remains unknown whether a sex-bias persists in NSERC DG-funded basic human cardiovascular research at Ontario universities. The purpose of this research is twofold. (1) Using a quantitative analysis, this research will determine the presence or absence of a sex-bias against the inclusion of women in NSERC DG-funded basic human cardiovascular research at Ontario universities from policy implementation to the present. After analysis of all NSERC DG-funded publications (n=96), female exclusion or under-representation was evident in 63% of publications. (2) By conducting semi-structured interviews with Ontario university basic human cardiovascular researchers (n=5) and by using thematic analyses, this study will characterize the sex-bias against the inclusion of women, and by using a sociocultural lens, will explore how research, as a social institution, may act to construct, maintain and reinforce sex inequalities. This research will highlight practical changes that could occur to challenge this sex-bias and increase female inclusion in cardiovascular research, ultimately with the goal of improving female cardiovascular health.

Speaker's Corner, Stauffer Library
Friday, March 8, 10:30-1:00
Moderator: Petra Fachinger, English

Creating Hybrid Identity: The Function of Epigraphs in The Wondrous Woo
Presenter: Gloria Li, English Literature
Faculty Supporter: Dr. Petra Fachinger

The Monkey King had trouble replacing his morning routine of drinking stolen royal wine with a double-double from Tim's.

Multiculturalism in Canada has created many hybrid identities among the children of immigrants. The novels of second-generation writers often reflect this reality. This presentation examines the function of epigraphs and its allusions to traditional customs, classics, and oral legends in The Wondrous Woo by Carrianne Leung. Miramar Woo, the protagonist and daughter of immigrants from Hong Kong, imagines a world of magical realism in the suburbs of Scarborough to encapsulate the space that lies between Canadian and Chinese culture. The novel is divided into chapters with each chapter introduced by an epigraph associated with Chinese-cultural references which is suggestive—although separate from the main narrative. An epigraph ironically references Tomb-sweeping to show the importance of ancestry and juxtaposes it to make sense of death. Classical allusions to the Monkey King act as a tool to express views toward love interests. Oral legends of the Snake Sisters exemplifies sibling interactions. Furthermore, the omission of an epigraph in the novel's final chapter performs the same function—to not only create tension, but also give perspective to Miramar's fluid experience. The epigraphs perform as a structural framework that capture the essence of Chinese traditions and channels them towards Miramar's experience as a "hybrid" Chinese Canadian. The significance of the epigraphs is not to emphasize dissonance in the reference, but rather the epigraphs act as a tool to show how Miramar understands the world as a Chinese Canadian in response to her alienation from dominant society

A Reflection on *Wondrous Woo*: A Quality Multicultural Text?
Presenter: Kimberly Ng, English
Faculty Supporter: Dr. Petra Fachinger

As a second-generation Chinese Canadian immigrant, I reflect on and respond to my first encounter with Chinese Canadian literature: Carrianne Leung's *The Wondrous Woo*. *The Wondrous Woo* is a YA novel following a Chinese girl, Miramar, who resides in the suburbs of Toronto as she navigates through university, relationships, and family hardships. My lack of exposure to Chinese Canadian literature combined with my desire to see Asian Canadians represented in popular media creates certain expectations for the novel. When *The Wondrous Woo* fails to represent my own experience of cultural hybridity, I find myself grappling with feelings of anger and frustration. The narrative forces me to ask whether novels like *The Wondrous Woo* can sustain novel quality while encouraging readers to explore complex dimensions of a diverse society, or if they address racism using stories with hidden objectives to commodify Chinese culture. By reading *The Wondrous Woo* through Nai-Hua Kuo's article "Depictions of Chinese Americans in Young Adult Literature," to problematize what it means for a novel to be a quality multicultural text, I begin to gain a new understanding of what Carrianne Leung is trying to illustrate in *The Wondrous Woo*.

Becoming by Returning Home in *The Wondrous Woo*
Presenter: Yiwen Tao, English
Faculty Supporter: Dr. Petra Fachinger

In Carrianne K. Y. Leung's novel *The Wondrous Woo*, the 1.5 generation – those who were born elsewhere but came to Canada at an early age – represent the challenge of *becoming* through returning "home." The uneasy marriage of becoming and homecoming that runs through the novel is decisively realistic. *Woo* blends elements of magic with realism only to reject romanticized rhetoric and advocate for the urgency of truth-telling and social empowerment. By juxtaposing different stories of becoming with various forms of homeward struggles, the novel gives expression to the transgenerational traumas and challenges that beset the 1.5 generation in the depths of their "homelessness." In part, this challenge surrounding their becoming is a *social* one. Through its themes of homelessness, self-parenting, and mental illness, the novel details the struggles of Chinese immigrant families as they are handicapped by a lack of social knowledge. Unfolding around the efforts of the Woo children to transcend their immigrant backgrounds and negotiate empowerment and flourishing away from hostile social forces, the novel ends on a note of hope, suggesting that the hardships that the 1.5 generation endure can lead to a rich and fulfilling life. I will discuss the notions of home and belonging in the novel by bringing Martin Buber's *I and Thou* and Kantian ethics in tandem, arguing that wherever an I-Thou bond develops, the formula of humanity is guarded, and home becomes possible.

Food, Family and Chineseness: Finding Belonging in Carrianne Leung's *The Wondrous Woo*
Presenter: Lily S. Zhu, English Language and Literature
Faculty Supporter: Dr. Petra Fachinger

"Straddling what they often describe as two cultures," second generation and 1.5 generation children of Chinese immigrants report feeling "never fully at home" in Canada (Kobayashi and Preston 236). Disconnected from their Chinese roots and rejected by the Canadian majority population, the Woo children struggle with this feeling of in-betweenness in the novel The Wondrous Woo. Carrianne Leung constructs a narrative of finding belonging through the different dishes that the Woo family creates, consumes, and encounters. Looking at food as a cultural marker and as a means of establishing identity and community, this presentation will examine the Woo children's attempts to feel at home, including trying to efface their Chineseness to fit in to dominant Canadian society. From Ba's summer barbeques to Miramar's cooking when attending the University of Ottawa, the novel criticizes this problematic process of achieving belonging through assimilation. Instead, the narrative arrives at the solution of family and togetherness: the Chinese-Canadian diasporic community must establish its own place by reconnecting with Chinese culture, and "in food lies this hope" (Leung 97).

Carrianne Leung, author, *The Wondrous Woo*, will give a reading from her book and there will be time for discussion.

Speaker's Corner, Stauffer Library
Friday, March 8, 1:15 to 3:15
Moderator: Valerie Michaelson, Public Health Sciences, School of Religion

Access to essential medicines within the ethnic health system in eastern Myanmar

Presenter: Alexa Boblitz, Life Science
Faculty Supporter: Dr. Colleen Davison, Department of Public Health Sciences

 The eastern border region of Myanmar is a mainly rural area, with a large population of vulnerable groups due to internal displacement and ongoing ethnic conflict and discrimination. Myanmar has the 2nd lowest overall health system performance out of 191 countries internationally, and reports indicate that ethnic communities are largely excluded from formal healthcare. Health and human rights concerns have been raised over limited access to essential medicines (AEM)[1,2]. Implications of not having AEM, such as antibiotics and vitamins, include high rates of morbidity, suffering, and morality at individual levels and low average life expectancy and poor overall health at the population level[3]. This cross-sectional study aims to describe the current level of access to seven different essential children's medicines in 98 clinics in eastern Myanmar, using stock data from the Health Facility Assessment Tools 2017 Survey. The association between level of clinic remoteness (distance to the clinic from a large city) and AEM is being explored. Data analysis is currently being conducted and results will be available in March 2019. There is limited research pertaining to this geographic region and population despite evidence of a damaged health system and a high volume of potentially vulnerable people. Therefore, the findings of this study could inform further investigations to improve equitable access to essential medicines among all people in eastern Myanmar.

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3. Ahmadiani, S. & Nikfar, S. Challenges of access to medicine and the responsibility of pharmaceutical companies: A legal perspective. *DARU, J. Pharm. Sci.* (2016). doi:10.1186/s40199-016-0151-z

Engaging with Indigenous Research

Presenter: Olivia Franks, School of Kinesiology and Health Studies
Faculty Supporter: Dr. Lucie Lévesque

Community-based participatory research (CBPR) within Indigenous communities aims to share project responsibilities and benefits equitably among community members and researchers. CBPR relies on authentic relationships that take time to build; so how does a student from a colonial institution such as Queen's University build the necessary relationships? As a Kanien'kehá:ka (Mohawk) student about to begin my graduate degree focusing on health promotion through a CBPR partnership with Indigenous communities, I will share my story and background of disconnect, as well as the identity-struggles I had prior to deciding that this field of research was right for me. Through this presentation, I will discuss the upfront process of being involved with Indigenous research as an Indigenous student, an advocate, and an ally. Regardless of Indigenous status, examining the research process in the context of individual positionality and researcher self-awareness is critical to successful CBPR research. My goal is to provide both Indigenous and non-Indigenous research trainees with important insight about positionality, identity,

power, and relationship-building as vital components of community-engaged research. I will discuss how the principles of CBPR align with Indigenous ideals and how these can be leveraged to establish connections that can support meaningful research with Indigenous communities.

Disability Theatre Manifesto
Presenter: Emily Gray, Dan School of Drama and Music
Faculty Supporter: Dr. Jenn Stephenson

For my thesis project, I have researched the current state of disability theatre in an effort to determine which practices are helpful or harmful to disability theatre. I have investigated: the inaccessibility of mainstream theatre, the connotations behind the word 'disabled', disability theatre's past, disability theatre's current state, who can play what role, professionalism in theatre, reviews, disclosures, methods to remove barriers, and calls to action. The end product of this research is an annotated manifesto that will be transformed into a presentation for Inquiry at Queen's. The rationale behind this manifesto is to contribute to the conversation about barriers to the disabled community, and be a reference point for how theatre artists can be more inclusive.

The Chinese Diaspora in Canada: Art Based Research and Research Based Art
Presenters: Karen Law, Fine Art and Concurrent Education
Faculty Supporters: Dr. Joan M. Schwartz

In this project, research is conducted through alternative research methodologies like artistic and visual research. The Chinese Diaspora and the themes pertaining to the topic are inquired through the investigation of archival images from the late 19th to early 20th century. The artist, as researcher, used the digital databases of Library and Archives Canada to conduct visual research on the Chinese Diaspora. The artist then uses historical images as a starting point for artistic research which questions the attitudes in which Chinese communities have been viewed by mainstream Canadian society and how such sentiments fit into Canadian whiteness and Canadian multiculturalism. Using both, painting and printmaking in her practice, Law examines historical images of the Chinese-Canadian diaspora's history to investigate her own experiences as a racialized person and connects both historical and contemporary attitudes surrounding diversity. The process of artistic research is then presented as a series of print and paintings, cumulated in the 2019 Union Gallery installation, Unassimilable.

Examining a Universal Design for Learning Approach in Music Education: An Action Research Project
Presenter: Miriam Miedema, Dan School of Drama and Music
Faculty Supporter: Dr. Julia Brook

A typical classroom in Ontario is filled with a variety of learners with diverse needs. These various needs require teachers to differentiate instruction or create a universal design for learning (UDL) so that all students can participate. As a result, research is needed to explore and describe successful programs that can support all learners. One way to do this is to develop pedagogical practices for atypical learners and examine how these could be broadened for more typical learners. This research examines a series of general music lessons, including singing, playing percussion instruments and musical games, for atypical twelve-year-old learners. An Action Research methodology was used to examine six weeks of lessons taught to three students by the primary researcher. Data were collected using reflective journals, portfolios and

videos of the sessions. Thematic analysis was conducted to examine similarities and differences in learner profiles, trends in the content of the lessons and pedagogical development over time, as well as to define some strategies or activities that could form the basis of a UDL approach. Despite the students' atypical learning profiles, only minor accommodations were required during lessons. Overall, this research demonstrates the value of a pedagogical approach that articulates learning goals while allowing the path to achieving those goals to be different for each student, reinforcing the importance of the UDL approach. Moreover, the action research methodology highlights the importance of incorporating opportunities to work with atypical students in music teacher education, so that future teachers can develop a UDL approach.

Being Uprooted and Re-planted: An International Adoptee's Experience of Belonging, Inclusion and Exclusion in Canada
Presenter: Anjali Shanmugam, Global and International Studies, Carleton University

The ethnographic study focuses on the experience of inclusion and exclusion for young transnational women who were adopted from India, by Indian-Canadian immigrant parents. The study examines the process of international adoption, and the emerging themes of belonging, identity and connectedness in Canada. The feelings of inclusion and exclusion will be analyzed through the lens of the self and relationships with family, friends and the local community. The paper will unpack the meaning of identity and belonging through reflecting on the experiences and memories of growing up in a single parent Indian family as an international adoptee from India. The focus of the paper will further contrast theories of scholars (Manzi, Ferrari, Rosnati, and Benet-Martinez, 2014) who have introduced concepts of multiple identities, and belonging. These scholars have applied these concepts to transracial adoptees, who have been adopted by families of a different race and/or ethnic background. By interviewing other international adoptees and analyzing their experiences, this paper will establish the similarities international adoptees encounter, and the challenges adoptees face in families of the same origin when they deal with integration into Canadian culture. Through a compare and contrast I will examine these factors in relation to my identity and its development. In conclusion, I have used my experiences and recent travel back to India to address the feelings of inclusion and exclusion. This has resulted in a cultural identity conflict between the country of origin and my adopted country. Therefore, I find myself neither included nor excluded, but rather I am placed in the center of both cultural identities.

Session VIII: New Frontiers
Seminar Room, Stauffer Library, Room 121
Friday, March 8, 1:00 – 2:00
Moderator: Morag Coyne, Engineering & Science Library

Virtual Reality in 3D Slicer
Presenters: Sal Choueib, School of Computing
Faculty Supporters: Dr. Gabor Fichtinger

Virtual reality is a rapidly expanding technology which places users in an immersive and interactable virtual environment. To this day, VR technology has been implemented in an array of applications. One such application is medical visualization. To evaluate such an application, SlicerVR was developed. SlicerVR is a virtual reality extension of 3D Slicer, an open-source medical image analysis and visualization platform. By extending 3D Slicer, SlicerVR will have easy access to a wide variety of tools used for medical visualization. SlicerVR was designed to be a flexible and extensible basis for virtual reality technology in the medical field, for use by medical professionals, researchers, students. With this in mind, we designed SlicerVR with

intuitive controls for ease of use, progressive rendering to manage issues of motion sickness, and a variety of customizable settings to optimize an individual's experience. To test SlicerVR, we designed an experiment that requires participants to complete timed-tasks while traversing complex virtual environments. With our experiment we can asses the advantages of stereoscopic vision in comprehending complex anatomical structures as well as the feasibility of navigating said scenes.

Underwater Surveys in Northern Menorca: Material Assemblages and Shipwrecks
Presenters: Jacob Roberts, Classics
Faculty Supporters: Dr. Fabio Colivicchi

A plethora of archaeology currently resides unfound at the bottom of the Mediterranean Sea. Artifacts and material assemblages distributed throughout this sea serve as preserved time-capsules, representing a relatively underrepresented source of historical and archaeological analysis. This paper analyzes shipwrecks of the Balearic Sea along Menorca's coastline to foreground the role that archaeology plays in reconstructing historical trade routes and ancient climatic during the late Roman period ($4^{th} – 7^{th}$ CE). Implementation of this research occurred in the summer of 2016, using methodologies of underwater survey to investigate Menorcan shelf bathymetry and material evidence. Position fixing and visual search techniques formed the bulk of methodological fieldwork, principally completed underwater through scuba diving. Complementing this study and its framework is the use of materiality from the adjoining Roman sites of Sanisera and Port de Sanitja. Pairing material analysis of unearthed amphorae with geospatial study allows for a partial recreation of ancient maritime climates and sea conditions, as well as macroeconomic scenarios of Menorcan late antiquity. Such an investigation opens up untouched and unobserved histories.

Design of a Portable Soil Analysis Instrument for Remote Teleoperated Rover Platforms
Presenter: James Xie, Emily Archer: Faculty of Engineering & Applied Science
Faculty Supporter: Dr. Joshua Marshall

The search for extant life has long been an interest since people have been able to successfully explore other worlds. However, on space missions, experiments must be performed autonomously, with limited resources, and a carefully selected suite of instruments. Instruments are additionally constrained by weight, reliability, and size which limits use of many modern advanced systems. The Queen's Space Engineering Team (QSET) is proposing the design of a portable (12" x 12" x 12") instrument to identify signs supporting extant life aboard a mobile rover platform during exploration missions. The instrument will receive soil samples collected by the rover, analyse the composition to identify key molecules, and transmit data back to a ground station. This system relies on colorimetric measurements using a UV-VIS spectrometer and features a solvent recycle system to minimize weight and waste. This project is part of a larger environment characterisation module to be mounted on a Mars rover system designed for competition at the University Rover Challenge (URC) at the Mars Desert Research Station (MDRS) in Utah. As of this date, each subsystem has successfully passed performance testing and the entire instrument is entering its system-level prototyping stage.

Queen's Learning Commons, Stauffer Library
Presenters will be present at posters Thursday, March 7, 11:30-1:00
Posters will be on view March 7 & 8

1. Gaining Insights into the Schooling Experience of Refugee Students through Art and Accompanied Narratives
Presenter: Alaa Azan, Institute of Interdisciplinary Studies, Child Studies program
Faculty Supporter: Carol Rowan

Recent scholarly writing concerning refugees and education are sometimes drawn towards deficit-perspectives. As a result, refugee families and children could be viewed as "Subjects of trauma" and "Vulnerable victims." The dominant deficit-discourse is perpetuated by focusing on themes of war, trauma, and fear when examining children's drawings. The current study aims to move away from this problem-based discourse and instead employ a strength-based approach to analyze the meaning of the school-based experiences of refugee students in Canada. The study will investigate the research question: How do a small group of refugee children, depict their lived school experiences in two Ottawa area community centers through drawings and verbal descriptions? The purpose of the study is to open space for discussions on the ways refugee students are viewing their schooling in Canada, building the capacity of educators, policymakers and everyone concerned with refugee's success to serve them better. Guided by a post-structural theoretical framework, the study used drawings and descriptions to document refugee children schooling experience. Arabic speaking refugee students ages 6-12 were asked to draw "a typical day at school." 18 Students were recruited from two community centers in Ottawa. The drawing activity took 20-30 minutes. Thematic analysis was applied to the data to help organize the emerging findings from the drawings and the verbal data. The results demonstrated the domination of themes on play and learning as reflecting the schooling experience and revealed the overall positive outlook of the participants towards their schooling in Canada.

2. Chemical Recycling of Polystyrene with Tertiary Amine Switchable Hydrophilicity Solvents
Presenters: Amelia Churaman, Dr. Ross Jansen van Vuuren: Chemistry
Faculty Supporters: Dr. Philip Jessop

Nearly 40 metric tonnes of expanded polystyrene (XPS) waste is collected through Kingston's curbside recycling program annually before being outsourced to companies with the means to recycle it. However, transporting XPS foam products is not economically viable. Therefore, a significant challenge is finding an efficient way to reduce the volume of the XPS foam prior to transportation since it has a very low density, consisting of up to 98% air. Currently, XPS products are compacted physically which requires the use of expensive compactors and energy-intensive compression processes. In 2011, Jessop et al. demonstrated that *N*,*N*-dimethylcyclohexylamine (DMCHA), a solvent with relatively low toxicity and volatility, can be used to recycle XPS using a greener approach. DMCHA is relatively hydrophobic under neutral conditions (e.g., in water), but becomes more hydrophilic when exposed to carbonated water (CO_2 dissolves in water, forming carbonic acid which protonates the DMCHA). I have worked on optimizing this process via the following steps. Firstly, the XPS is dissolved in a small volume of DMCHA in its hydrophobic, neutral form. Then, the PS-DMCHA mixture is added to carbonated water causing the DMCHA to become hydrophilic and to dissolve in the aqueous solution, resulting in a layer of PS on the surface. The PS can then be easily collected and air-dried. By adding a 30 wt.% PS/DMCHA solution to carbonated water at 60°C, I have been able to achieve a typical purity of 95 wt.% of the final XPS (i.e., 5 wt% of DMCHA remains in the XPS), determined by ^1H NMR.

3. A Variation of 3D Printer Machinery for Spectroscopic Tissue Analysis
Presenter: Laura Connolly, Electrical Engineering
Faculty Supporters/Co-authors: Gabor Fichtinger, Parvin Mousavi, Scott Yam, Tamas Ungi, Andras Lasso, Thomas Vaughan, Mark Asselin

PURPOSE: Raman Spectroscopy is amongst several optical imaging techniques that have the ability to characterize tissue non-invasively. To use these technologies for intraoperative tissue classification, fast and efficient analysis of optical data is required with minimal operator intervention. Additionally, there is a need for a reliable database of optical signatures to account for variable conditions. We developed a software system with an inexpensive, flexible mechanical framework to facilitate automated scanning of tissue and validate spectroscopic scans with histologic ground truths. This system will be used, in the future, to train a machine learning algorithm to distinguish between different tissue types using Raman Spectroscopy.

METHODS: A sample of chicken breast tissue is mounted to a microscope slide following a biopsy of fresh frozen tissue. Landmarks for registration and evaluation are marked on the specimen using a material that is recognizable in both spectroscopic and histologic analysis. The slides are optically analyzed using our software. The landmark locations are extracted from the spectroscopic scan of the specimen using our software. This information is then compared to the landmark locations extracted from images of the slide using the software, ImageJ.

RESULTS: Target registration error of our system in comparison to ImageJ was found to be within 1.1 mm in both x and y directions.

CONCLUSION: We demonstrated a system that can employ accurate spectroscopic scans of fixed tissue samples. This system can be used to spectroscopically scan tissue and validate the results with histology images in the future.

4. Comparison of Pitch Accent in Native Speakers of English & Mandarin Learners of English
Presenter: Sonja Frazier, Linguistics & Concurrent Education
Faculty Supporter: Lorena Jessop

This research project was conducted as a pilot study to explore how pitch accent is used by NCES (Native Canadian English Speakers) and MLE (Mandarin Learners of English). Pitch accents are the prominent high or low tones, that are predominantly found on content words (N, V, Adv, Adj, etc.) in English. In order to compare how both speech communities use pitch accent in English, participants were given an EI (Elicited Imitation) Task. The EI involved participants hearing and then repeating a sentence. It is also reconstructive in nature meaning that the participants process the sentence, then reconstruct it with their own grammar, and finally reproduce it. The results showed that Mandarin speakers had more pitch accents than English speakers, adding pitch accents on function words (Art, Pro, Prep, etc.) as well. The results also demonstrated that Mandarin speakers had less creaky words (words said in a very low pitch, also known as laryngealization or vocal fry) than the English participants. Implications of this study concern ESL Education; such as should English pitch accent patterns and creak in English be taught to English language learners.

5. Do Associations Affect Who Gets Blamed?
Presenters: Hailey Goddeeris, Psychology
Faculty Supporters: Dr. Stanka Fitneva

Blame and responsibility are ascribed to individuals who are directly or indirectly involved with harmful actions. Previous literature suggests that individuals are more likely to assign blame to an individual rather than a collective group, when individual actions and intentions are identified. If a group is viewed as a single unit, then blame is placed on the whole group, even if the action is performed by one member. Parents are often blamed for the actions of their children, without being involved in the child's actions. Knowledge of group entitativity, and how intent and action of members in a group affects distribution of blame has been largely overlooked. The present study examined the difference in the amount of blame assigned to individuals. Specifically, we examined a situation where both individuals are not involved in a harmful action, but one is associated with the harming agent, while the other is not. My results suggest that adults use association to assign blame, indicating that association alone is enough for blame assignment.

6. Professionalism and the Construction of Teacher Professional Identity
Presenters: Ashlyn Gregory, Emma Cathcart, Alex Bates: Faculty of Education
Faculty Supporters: Dr. Holly Ogden

Professionalism and the construction of teacher professional identity is a focus of our teacher education program and a pillar that guides the daily practices of educators (OCT, 2016). For teachers to be viewed as professionals within their classroom and community, they must understand the high standards of being a teacher and strive every day to meet and exceed those expectations (Hurst & Reading, 1999). The purpose of our collaborative research is to explore how teachers determine the fine line between professionalism and compassion in the classroom and in professional relationships. The findings suggest that professional relationships are constantly evolving and that boundaries are of utmost importance for teachers. Educators must follow professional standards while maintaining a balance between compassionate support and professional impartiality regarding student's needs. The root of professionalism is effective multilateral communication between teachers, administration, parents, and students. A multi-faceted understanding of professionalism is essential for new teacher candidates to ensure their professional success and the effective learning of students in the classroom. These recommendations will help teacher candidates and new educators maintain professional relationships and evaluate their conduct within the educational community.

7. Does habitual endurance exercise protect endothelial function against acute exposure to oscillatory shear stress?
Presenter: A.S. Grewal[1]
Co-authors: J.C. Tremblay[1], N. Preobrazenski[2], B.J.Gurd[1]
Faculty Supporter: Dr. K.E. Pyke[1]

[1]Cardiovascular Stress Response Lab, School of Kinesiology & Health Studies, Queen's University, Kingston, Ontario.
[2]Muscle Physiology Lab, School of Kinesiology & Health Studies, Queen's University, Kingston, Ontario.

Introduction: Acute exposure to increases in oscillatory shear stress (increased retrograde shear stress and decreased mean shear stress) reduces flow-mediated dilation (FMD). This impairment may be mediated via increased oxidative stress. Habitual endurance exercise training results in increased antioxidant protection. However, it is currently unknown whether these adaptations protect against oscillatory shear stress-induced impairments in FMD.

Purpose and Hypothesis: The purpose of this study is to determine whether lower limb endurance-trained athletes have protection against oscillatory shear stress-induced impairments in FMD compared to

sedentary individuals. It is hypothesized that athletes will have a preserved FMD after an acute oscillatory shear stress intervention, compared to their sedentary counterparts.

Methods: Healthy, young adult volunteers (18-29 years old) will be screened for physical activity (PA) through a physical activity recall questionnaire. 12 sedentary individuals (<3h of structured PA/week) and 12 lower limb endurance athletes will be recruited to participate. All participants will complete a VO_2 peak test to objectively measure cardiorespiratory fitness. Participants will visit the laboratory twice in the same week for vascular testing. Both 90-minute visits will begin with 45 minutes of supine rest, followed by a brachial artery FMD test before and after 30 minutes of either imposed oscillatory shear stress (forearm cuff inflated to 70 mmHg) or a 30 min rest period (control).

Significance: This will be the first study to investigate whether endurance-trained athletes are resistant to oscillatory shear-stress induced impairments in endothelial function. This will provide insight into mechanism contributing to the vasoprotective effects of habitual endurance exercise.

8. Seedling regeneration at northern treeline, Northwest Territories tundra
Presenters: Emily Grishaber, Environmental Science
Faculty Supporters: Dr. Ryan Danby

 Global warming has had an amplified effect in northern environments (i.e. Arctic and Subarctic regions). An indirect result of this warming is what is known as Arctic greening, which is the increase of photosynthetic material, or plant matter, in Arctic environments. How this greening trend is represented by trees at latitudinal (or northern) treeline is largely unknown. To determine how treeline may respond, I am investigating the physical environment surrounding seedlings found growing at treeline in the Northwest Territories, as well as the reproductive capacity of the mature trees in this region. Physical characteristics of sites which contain seedlings are compared to sites within the same region which do not in an attempt to determine what aspects of these environments are significant in the establishment of seedlings at treeline. Site characteristics include vegetation cover, distance to mature trees, and distance and dimensions of the nearest shrub. Reproductive capacity of mature trees is also tested to determine how significant seed viability may be in generating seedlings in this region. The limiting factor in treeline expansion may be an issue of pre-dispersal (i.e. viable seed production) as opposed to post-dispersal (i.e. seedling growth). I am conducting a germination test where I have extracted seeds from fifteen trees dispersed throughout the treeline region and have placed them under ideal growth conditions for an honest depiction of viable to unviable seed ratios. These tests may show conclusive evidence regarding what factors are contributing to treeline dynamics within a changing environment.

9. Picturing Canada: Tracking Ontario's Photographers from 1839-1889
Presenter: Jessica Lanziner, Fine Art and Art History
Faculty Supporter: Dr. Joan M. Schwartz

This project focused on gathering information relevant to photography in British North America from the period of 1839-1889. It utilized the digitized newspapers available on the searchable Paper of Record database, beginning with Halifax, Toronto, St. Thomas, and Vancouver. The recorded information highlighted photographic service advertisements, studio location changes, photographic bookings, and new developments in photographic technology. This research allows for insight into how and for what purposes photography was being used in this time period. Through examining different newspapers across multiple locations, this project was able to track the speed at which news and technological developments were received in different areas. The project additionally tracked and mapped the location of artists and

photography studios, in an effort to tie the movement of photographers from one city, town, or province, to one another. Several photographers were discovered to occupy the same photographic studios, passing off their studios to others, while in pursuit of a greater opportunity elsewhere. In executing this research, this project established a basis for on the archived information on early Canadian photography, and specifically, the connections between the movement of photographers.

10. The Chinese Diaspora in Canada: Art Based Research and Research Based Art
Presenters: Karen Law, Fine Art and Concurrent Education
Faculty Supporters: Dr. Joan M. Schwartz

In this project, research is conducted through alternative research methodologies like artistic and visual research. The Chinese Diaspora and the themes pertaining to the topic are inquired through the investigation of archival images from the late 19th to early 20th century. The artist, as researcher, used the digital databases of Library and Archives Canada to conduct visual research on the Chinese Diaspora. The artist then uses historical images as a starting point for artistic research which questions the attitudes in which Chinese communities have been viewed by mainstream Canadian society and how such sentiments fit into Canadian whiteness and Canadian multiculturalism. Using both, painting and printmaking in her practice, Law examines historical images of the Chinese-Canadian diaspora's history to investigate her own experiences as a racialized person and connects both historical and contemporary attitudes surrounding diversity. The process of artistic research is then presented as a series of print and paintings, cumulated in the 2019 Union Gallery installation, Unassimilable.

11. Can you get emotional support through a screen? A look into digital and in-person emotional support and emotion regulation
Presenter: Lauren Lin, Psychology
Faculty Supporter: Dr. Tom Hollenstein

Social support is positively related to overall well-being and relationship quality with others, and specifically, may help with successful emotion regulation (Himle, Jayaratne, & Thyness, 2008; Liang, Ho, Li, & Turban, 2014; Strine, Chapman, Balluz, & Mokdad, 2008; Thoits, 2011). With the rapid increase in the use of information and communication technologies (ICT), much social support is now sought and received digitally rather than in person, which involves different methods of interacting with others. The current study examines the indirect effects of seeking and receiving social support both digitally and in-person on the relationship between emotion intensity and emotion regulation success. Two hundred participants were recruited from the Queen's University psychology participant pool. Participants were prompted through a smart phone experience sampling app three times a day for two weeks to answer questions about their emotions and social support. We predict that emotion intensity will be related to lower emotion regulation success but more seeking and receiving social support. We also predict that seeking and receiving social support will be related to each other and that they will both be related to higher emotion regulation success. Additionally, it is expected that seeking and receiving emotional support in-person and digitally will be part of two indirect pathways from emotion intensity and emotion regulation success. The current study will provide information on whether digital emotional support has equivalent beneficial effects on emotion regulation as in-person emotional support, which could inform targets for future emotion regulation interventions.

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12. The Role of Retrospective Negative Information-Processing Biases in Remitted Depression
Presenters: Orly Lipsitz, Psychology
Faculty Supporters: Dr. Luis Flores

 Major Depressive Disorder (MDD) is characterized by persistent and impairing low mood and loss of interest or pleasure. Given that MDD is highly recurrent, it is important to identify which impairments remain during remission and may predict recurrence. A key impairment in MDD is that they tend to process current and past information more negatively than healthy individuals. However, it is unclear whether this negative information-processing bias persists during remission. This study will investigate a retrospective type of negative information-processing bias when recollecting recent real-world events among young adults with remitted depression (n=31) compared to healthy individuals (n=32). Participants were given a handheld device and responded to prompts on the device four times a day for one week. The prompts asked whether the individual experienced a positive or negative event since the last prompt and how intense that negative or positive event was. At the end of the week, participants completed a questionnaire regarding their experiences over the past week. They were asked how many negative and positive events the individual experienced over the past week, and the overall intensity of these negative and positive events. It is hypothesized that individuals with remitted depression will report a greater number and intensity of negative events in the distal retrospection period than in the proximal retrospection period, but no difference is expected for positive events. The opposite findings are expected for healthy individuals. This research may advance the understanding of persistent impairments in remitted depression while focusing on real-life events.

13. The "Bulletin Board Poster" Survey: A Unique type of Questionnaire
Presenter: Olena Anna Pankiw, Languages, Literatures and Cultures & The Strathy Language Unit
Faculty Supporter: Anastasia Riehl

Questionnaires have long been used as a research tool in studies of Canadian English (e.g. Chambers 1994, Dollinger 2015), whether in person, in written form or more recently, digitally. In this talk, I introduce a unique type of questionnaire, the "bulletin board poster" survey. In this talk I will describe an ongoing project that I have been undertaking as a research assistant at the Strathy Language Unit at Queen's University since September 2017. During this time, I have been creating biweekly questionnaire posters on a range of topics in Canadian English – lexical, phonological and syntactic, which I display in public areas on campus. I then tabulate the data and create posters summarizing the results, which I also display on campus. The "bulletin board poster" method of data collection clearly has its limitations, such as the lack of control over who participates and how accurately they do so, but it has benefits as well, such as engaging the participants

on the topic and encouraging participation in more rigorously controlled studies. In my presentation, I will discuss the stages of this project, the pros and cons of the "bulletin board poster" method and other survey methods and share some of our results. I hope to encourage discussion on this type of data collection and share my tips on how I manage to make this a successful way of collecting data.

14. Optimal storage conditions to maintain the performance of a chip-based electrochemical biosensor
Presenters: Chankyu Park, Chemistry
Faculty Supporters: Dr. Zhe She

A chip-based electrochemical biosensor allows a rapid and cost-effective measurement which can take less than 30 mins. In comparison, the current method of detecting bacteria is expensive and time-consuming because it must go through cell culturing and laboratory work, which can take 5 days. For this reason, we have been developing a chip-based electrochemical biosensor by modifying commercially available chips. Biosensors using antibodies and DNA are great for identifying specific strains of bacteria. However, their narrow scope is not suited for environmental monitoring. We have been using Toll-like Receptors as the biorecognition element, which has a wider scope detecting a wide range of pathogens. The constructed biosensors are tested against diacylated lipopeptide (Pam2CSK4), a Pathogen Associated Molecular Pattern. Some of the chips are tested right away against Pam2CSK4 while the rest of them are stored in different storage conditions varying in temperatures, buffers and additives. The performance of the chips before and after each storage condition is compared. Finding an optimal condition to maintain and enhance the performance of the chip is critical when it comes to real-life application. However, it is challenging to maintain stability of the protein bound to the chip surface because multiple factors need to be considered such as the adhesive force strength of each layer. We are putting in more effort in developing the understanding towards this direction.

15. Personalizing Chatbot Conversations with IBM Watson
Presenters: Kennedy Ralston, Department of Computing
Faculty Supporters: Dr. Farhana Zulkernine

Systems powered by artificial intelligence are being developed to communicate with users in a progressively "human-like" conversational way, in order to make them more user-friendly. Such systems are utilized across many industries including teaching, marketing, and health care, and are commonly made available to the public as interactive chatbots. It is important to explore new possibilities in development to make these systems more personalized to their users by improving and expanding their functionality and interactivity. This project delves further into this topic by creating a system that generates increasingly customized responses to user input. One crucial way to improve the functionality of an artificial intelligence system is by molding a personal profile of the user, which can be referenced by the system in order to respond to the user's needs in an adaptive way based on their preferences. The project is focused on investigating packages that can be used to more effectively respond to the user's mood, personality, and language, including IBM Watson Tone Analyzer, Watson Personality Insights, and Watson Language Translator. These packages are then utilized to work towards creating an intelligent, interactive system that can effectively fulfill the individual needs of its users.

16. Multiple Risk Behaviours and Concussions among Adolescents in Ontario
Presenters: Josh Shore, Kinesiology
Faculty Supporters: Dr. Ian Janssen

Concussion has become a significant public health concern among Canadian youth, as estimates of pediatric concussion incidence have increased from 340.5 per 100,000 in 2003 to 601.3 in 2010, and 1500 in 2013. This

recent surge in concussion diagnosis has led to extensive research into the physiological mechanisms underlying traumatic brain injury, as well as sport-focused policies and return to play protocols following concussion. However, there is a paucity of research regarding social and behavioural risk factors for the development of a concussion. Multiple risk behaviours (MRB) represent a clustering of behaviours that often develop together during adolescence, such as alcohol consumption, illicit drug use and unprotected sex. These behaviours indicate an increased tendency for risk-taking, and have previously been associated with an increased risk for injury. Although the current literature describes a consistent injury risk gradient associated with increasing engagement in MRB, few studies have examined the relationship between engagement in MRB and the incidence of specific injuries. This study further investigates pediatric concussion through two research objectives. The first objective is to describe concussion prevalence, differences in prevalence by age and sex, as well as activity leading to concussion, among Canadian youth in grades 6-10. The second objective is to investigate the relationship between engagement in multiple risk behaviours and concussion within the same population. It is hypothesized that children engaging in greater risky behaviour will exhibit higher concussion prevalence. The results of this study may be used to inform behavioural interventions designed to reduce concussion in youth.

17. The political representation of women in the Soviet Union compared to modern-day, democratic Russia
Presenters: Bohdan Tyvodar, Department of Political Studies
Faculty Supporter: Dr. Elizabeth Goodyear-Grant

Over 25 years after Russia's independence, Russia has established itself as one of the world's most powerful countries, however, it seems to have forgotten about its women. This study examines why women in the Soviet Union were more represented in political institutions, specifically in the national government, than women in modern-day, democratic Russia. This study is timely and relevant because women's political representation is an issue to which a lot of attention is devoted in the media and in academic literature. This study investigates and compares women's involvement in political institutions in the Soviet era compared to the post-Soviet, democratic era, a natural turning point in which we would logically expect growth rather than retraction of women's political representation. Period one encompasses women's representation in political institutions of the Soviet Union from 1922-1991, with an emphasis on the Gorbachev era. Meanwhile, period two encompasses women's representation in political institutions of modern-day Russia, 1991 to today. The research in this study indicates that the Marxist-Leninist ideology of the Soviet Union, the political liberalization started by the Soviet Union in the late 1980s and continued by Russia in the early to mid 1990s, and the rise of conservatism in post-Soviet Russia, are three important factors accounting for the increased gender imbalance in representation in the modern era.

18. Is Canada's post-graduate medical education curricula producing physicians who can provide culturally safe care?
Presenters: Annie Wortzman, School of Kinesiology and Health Studies
Co-author: Cortney Clark, Indigenous Access and Recruitment Coordinator, Faculty of Health Sciences
Faculty Supporters: Sarah Dobrowolski and Dr. Lucie Lévesque

Indigenous peoples living in Canada experience significant health inequities relative to non-Indigenous people, which stem largely from experiences of colonization, past and present. An important contributor to such inequities is the paucity of culturally safe healthcare available to Indigenous people. A lack of relevant educational experiences for healthcare professionals has been implicated in both creating culturally unsafe healthcare environments and in perpetuating these healthcare-related inequities (Guerra & Kurtz, 2017). The Truth and Reconciliation Commission of Canada (TRC, 2015) calls for improved cultural safety training for healthcare professionals treating Indigenous patients. Recently, post-graduate medical education training programs have shifted to a competency-based model (CBME) whereby specific learning objectives must be

attained to graduate, compared to the historical time-based model (Iobst et al., 2010). However, it is unknown whether the CBME programs sufficiently fulfill the TRC calls to action pertaining to Indigenous health. The objective of this study is to determine the extent to which Canada's CBME curricula provide cultural safety training regarding Indigenous health. An environmental scan of the publically available national CBME curricula will assess the content of the core portions of the training programs. A self-report mixed-methods survey will be distributed to medical residents at Queen's University to determine the extent to which they perceive that such training is provided to them. This research aims to identify gaps in the CBME curricula pertaining to Indigenous health, so as to contribute to improved cultural safety training, and thus health equity, in the future.

19. Comprehension

Presenters: Paige Wregget, Adam Card, Ryan McCann, Jayne Gazzola, Rachel Hacault: Concurrent Education
Faculty Supporter: Holly Ogden

The purpose of our collaborative research is to explore what it takes for an educator to bring about genuine comprehension of any subject matter and to measure the level of comprehension attained by students. Student comprehension has been defined as the ability to perform sets of sub-skills to a level of mastery (McTighe, 2018). Comprehension is evident when students demonstrate applications of their knowledge to new situations, explain their thinking, and justify their conclusions (Brookheart, 2010). Findings suggest that there are five main pillars supporting student comprehension; a) Identifying, b) Connecting, c) Questioning, d) Reiterating, and e) Communicating. Each component involves action by both instructor and learner to promote absorption of information. To assess whether these steps are effective, educators must implement different testing constructs. "Levels of mastery" is an assessment scale that focuses on comprehension. Teachers can also prompt students to provide evidence supporting their observations. This multifaceted understanding of comprehension is essential for new teacher candidates so that they can provide the most effective instruction for the learning process and lead to fuller intellect amongst our students and beyond. Further research on this topic could establish the effects of implementing these methods and explore the changes required to enact the five pillars within the current curriculum context.

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Lin, Lauren	Session III
Lipsitz, Orly	Session III
Lochbihler, Aidan	Session I
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SESSION III are Poster Sessions.
Asterisk (*) signifies a group presentation.

Acknowledgments

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