Inquiry@Queen's

5th Annual Undergraduate Research Conference

Program

March 10 & 11, 2011
Queen's Learning Commons

Stauffer Library

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TABLE OF CONTENTS

March 2011

We are very proud to have reached a milestone of sorts – the 5th 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.

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!

We thank all those who have supported us over the past five years. Congratulations to all participants!

On behalf of the Inquiry@Queen's Steering Committee,

Co-Chair, Jackie Druery
Head, Learning and Research Services
Stauffer Library

Co-Chair, Vicki Remenda
Queen's Chair in Teaching and Learning, 2006-09
and Geological Sciences and Geological Engineering

CONFERENCE AGENDA

Thursday, March 10, 2011
Speaker's Corner, Queen's Learning Commons, Stauffer Library

NOTE: All sessions are held in Speaker's Corner unless otherwise indicated.

9:00 Coffee

9:30 Opening Remarks
Dr. Vicki Remenda, Geological Sciences and Geological Engineering

Opening Panel: *Dimensions of Research*
Dr. Steven Liss, Vice-Principal, Research, Queen's University
Michelle Thompson, Geological Sciences and Geological Engineering,
Unlocking the Magic of Moon Dust: My Experiences as a Summer Research Intern for NASA
Kristen Martin, Drama, *'Breaking Down the Wall:' Performing History*
with performance group Marissa Nacimben, Colie Belej-Corrigan, Brett Payette, Aimee Bouchard, Michelle Yagi, Leora Smith

10:45 Session I: Peers, Norms & Others I

10:45 Session II: Cycles (Room 121, Stauffer Library)

12:30 *Inquiry in the Classroom*
It is easy to imagine inquiry in laboratories, thesis meetings, and capstone seminars. But is there a place for inquiry learning in the classroom? Especially large classrooms? How do we as faculty engage our students in "context-appropriate" inquiry? How do we assess the results? Jill Atkinson (Psychology), Anne Godlewska (Human Geography) and Vicki Remenda (I@Q, Geology) discuss their experiments and experiences; and the students of GEOL 302 present an "Elevator Chat". Light Lunch. All Welcome!

1:30 Session III: Identity & Nationhood

1:30 Session IV: Listening [aka Do you hear what I hear?]
(Room 121, Stauffer Library)

3:30 Break

3:45 Session V: Sex, Power and Punishment

3:45 Session VI: To Market… (Room 121, Stauffer Library)

Friday, March 11, 2011

Speaker's Corner, Queen's Learning Commons, Stauffer Library

9:00	Coffee
9:30	Session VII: Response to Disease
9:30	Session VIII: Peers, Norms & Others II (Room 121, Stauffer Library)
11:30	Session XI: Pizza and Posters: Lunch with the Poster Presenters (Room 121, Stauffer Library), All Welcome
1:00	Session IX: C & N: Carbon & Nitrogen
1:00	Session X: …5,6,7,8 (Room 121, Stauffer Library)
3:20	Conference Wrapup

ORAL PRESENTATIONS

Opening Panel Presentation

Speaker's Corner, Queen's Learning Commons, Stauffer Library
Thursday, March 10, 9:30

'Breaking Down the Wall:' Performing History

Presenter: Kristen Martin, Drama
Faculty Supporter: Dr. Jenn Stephenson, Drama
Performance Group: Marissa Nacimben, Colie Belej-Corrigan, Brett Payette, Aimee Bouchard, Michelle Yagi, Leora Smith

In 2007 Queen's University tore down the twenty-foot limestone walls surrounding Kingston's old Prison for Women, at one time the only Federal Penitentiary for women in Canada. When the building's new owners destroyed the walls, Queen's students, and Kingstonians alike, stopped on their journeys to and from 'West Campus' to observe the revealed "Medieval Fortress" and ponder what had once existed. Since 2002 I have been researching the unique history of this building and the stories of the women who once lived, worked and died here. By combining this research with my theatrical background I have been creating a theatrical production by leading an ensemble of six women through a devised theatre process. It is my hope to further break down the barrier between Kingston and the unique history and culture that existed here from 1934 to 2000. As an ensemble we have been working with stories, movement and song to bring the piece to life. The P4W inmate magazine "The Tightwire" has provided us with original stories, poems, songs, articles and artwork created by the inmates themselves. By integrating the words of the female inmates we hope to paint an earnest picture of what life was like behind the walls of the P4W. We will be performing this piece in the Rotunda Theatre on Queen's Campus on March 31st and April 1st.

Session I: Peers, Norms and Others I

Speaker's Corner, Queen's Learning Commons, Stauffer Library
Thursday, March 10, 10:45-12:25
Moderator: Dr. Susan Brodt, School of Business

Cognitive Process of Peer-Aggressive Scenes Between Adolescents with History of Peer-Aggression and Peer Victimization

Presenter: Catherine Jee, Psychology
Faculty Supporters: Dr. Wendy Craig, Psychology; Dr. Monica Castelhano, Psychology

The purpose of this study is to examine group differences in eye movement between people with a history of perpetrating in peer aggression and people with a history of peer victimization on the processing of peer-aggressive and non-aggressive scenes. As Richard Hazler (1996) claimed that 'bullies only see the event and its result from their own perspectives', children who perpetrate in peer-aggression may attend to different social cues than those who do not engage in peer-aggression or who are victimized by peer-aggression. To better understand these differences, we need a direct assessment of their attention. Thus, in my study, the eye movements of participants are recorded while they are presented with aggressive and non aggressive scenes. As previous studies suggested that individuals with a history of perpetrating in aggression are more likely to pay attention to aggressive stimuli, I predict that the aggressors will pay more attention to the bullying targets than the victimized targets in aggressive scenes. I also expect that the aggressors would pay more attention to the bullying targets in

aggressive scenes than the victims would. This study should expand our knowledge on cognitive processes of peer-aggressors and may inform the development of more effective bullying intervention programs where selective attention of peer-aggressors could be guided to reduce their biased perception of social situation.

From "Bringing up Good Children" to "Making a Difference in the World": Examining Gender, Motherhood, and Career in a Century of Girl Guide Manuals

Presenter: Sabina Pagotto, History

You've eaten their cookies and heard their campfire songs and seen the sashes full of badges. But have you ever thought about which badges girls are asked to earn, and why? In light of the 100th anniversary of the Girl Guides of Canada in 2010, this presentation questions previous interpretations of the organization's history. Gender historians have long considered Guiding to be a bastion of prescriptive femininity, citing the organization's stated aim of teaching girls womanliness. Meanwhile, historians focusing on the Boy Scout movement have placed Scouting's genesis within the context of a crisis of masculinity, leaving no space for a discourse of femininity and writing Guiding off as Scouting's uninteresting younger sister. A closer look reveals the situation to be far more complex. Through the analysis of a representative sample of Guide manuals, handbooks, and program books throughout the twentieth century, and drawing on research done about Girl Guides in the UK, this presentation seeks to complicate both the movement's historic origins and its relationship with traditional femininity. Topics examined include the imperialist origins of Guiding and Scouting, the influence of the Baden-Powell family over Guiding manuals, the use of historical Canadian heroines in Guide manuals, the manuals' mixed messages about gender roles and future careers, the evolution of Guiding over the course of the twentieth century, and the Girl Guides of Canada's pro-feminist redefinition in the early 1990s. The presentation contends that Guiding in fact had a complex and nuanced relationship with gender, motherhood, and career options.

Gendered Secularization and the Body Policing of Muslim Women

Presenter: Raissa Killoran, Religious Studies
Faculty Supporter: Dr. Dana Olwan, Gender Studies

The many usages of the term 'secularism' have generated an ambiguity in the word; as a political guise, it may be used to engender anti-religious fervor. Particularly in regards to veiling among female Muslim adherents, the attainment of a secular state and touting of the necessity of dismantling religious symbols have functioned as linguistic shields. By calling a "burka ban" necessary or even egalitarian secularization, legislators employ 'secularization' as jargon for political ends, enacting a stance of supremacy under the semblance of progress. Secularization has come to function as a political tool - in the name of it, governments may prescribe which cultural symbols are normative and which are of 'other' cultures or religious origins. As such, the identification of some religious symbols as foreign and others as normative is a usage of secularization for normalization of dominant religious expression. In this, there is an implicit neocolonialism; by imposing standards of cultural normalcy which are definitively non-Muslim, such policies attempt to divorce Muslims from Islam. Further, I intend to investigate the gendered aspect of secularization politics. By critiquing clothing and body policing of women, I will demonstrate how secularization projects use the female body and dress as a site for display. By rendering the female physically emblematic of the honor and virtue of an 'other' culture, those enacting secularization norms target women's bodies to act as visual exhibitions of the dominant culture's hegemony. Here, we see gendered secularization at work - female bodies become controlled by the anti-religious zeal of the state, while the state carries out this control on the predicate that it is the religious group enacting unjust control. As such, the policing of female Muslim bodies is symbolic of the policing of Islam as a whole; it acts as an illustration of an imposed, gendered secularization project.

Influence of Knowledge Distribution on Children's Information Seeking Strategies

Presenter: Ena Vukatana, Psychology
Faculty Supporter: Dr. Stanka Fitneva, Psychology

Early in development, children rely on others to obtain information about unfamiliar situations or objects. They can exploit sources of information, by asking a familiar informant, or explore new sources by asking an unfamiliar informant. Children's choices are guided by their previous experience with each informant. Children as young as 4-years-old have been shown to track informant accuracy and direct future questions to the more accurate informant (Fitneva & Dunfield, 2010; Koenig & Harris, 2005). Moreover, the distribution of knowledge may also have an impact on children's information seeking strategies. In the current study, children were presented with an informant who correctly answered some questions. For the final question of a category, they were asked to make a choice between the familiar and unfamiliar informant. The key manipulation of this study was the knowledge distribution, as children were explicitly told either one informant or all the informants know the names of the objects in question. We expect that, in the narrowly- distributed knowledge condition, children will be more likely to exploit. On the contrary, we expect that they will be more likely to explore in the broadly-distributed knowledge condition.

Experiences of Belonging in Engineering Undergraduate Education at Queen's

Presenter: Amy Buitenhuis, Geography, Applied Mathematics Engineering
Faculty Supporter: Dr. Anne Godlewska, Geography

The purpose of this study is to explore the role that the engineering undergraduate degree plays in the socialization process of professional engineers. I will look at how exclusion is normalized through undergraduate education. To do this, I will analyze the history and content of the Iron Ring Ceremony. This ceremony has symbolic significance to engineering students as it marks the completion of the undergraduate degree. It is also a ceremony unique to Canada, which will provide insights into the engineering profession in the Canadian context. I will also conduct interviews with 12 graduates of the Queen's undergraduate engineering program to gain insights into how engineering undergraduate education plays a role in shaping engineering identities. I will use my findings regarding the Iron Ring Ceremony to understand feelings of belonging and patterns of exclusion and inclusion throughout undergraduate engineering education.

Session II: Cycles

Stauffer Library 121, Queen's Learning Commons, Stauffer Library
Thursday, March 10, 10:45-12:25
Moderator: Dr. George Bevan, Classics

Using Reflectance Transformation Imaging (RTI) to Record and Interpret Weathered Tombstones in the Cataraqui Cemetery

Presenter: Sarah McCutcheon, Classics
Faculty Supporter: Dr. George Bevan, Classics

Once our history is lost, what can be done to recover it? The information provided on tombstones is an important source for historians and genealogists but is easily lost as many tombstones are weathered or damaged over the course of decades of exposure to the elements. For many, tombstones are the only record that survives which is why it is important to collect its information. Last year a project was run in order to record degrading tombstones at the Cataraqui Cemetery in Kingston, Ontario using Reflectance Transformation Imaging which is a more cost-effective technique compared to other methods and the

results are easily read by laypeople. This technique produced a clear image of the inscriptions which are no longer visible to the naked eye. However, where the damage was too extensive archival data was used to fill in the missing pieces. Thus in some cases a full record can be recovered of the tombstone's inscription through a combination of research and imaging. This pilot project has demonstrated RTI as a potent technique to record local heritage and preserve genealogical information that would be otherwise lost to the ravages of time.

So Your Data's Not Perfect - Get Over It!

Presenter : Nathalie Moon, Mathematics and Statistics

In a well known Peanuts cartoon, Lucy picks up a book and reads: "A man was born, he lived, and he died. The End!", and tosses the book aside. Linus picks the book up reverently and says : "What a fascinating account. It almost makes you wish you had known the fellow." Taking a broader view, survival analysis is the study, on a population scale, of life cycles for humans, machines, or anything else that has a beginning and an end. Incomplete or "censored" survival data presents real challenges for researchers. This presentation will describe ways in which mathematics can be used to overcome some of the shortcomings of censored survival data, improve our ability to predict outcomes, and ultimately improve our lives.

Skunk – The Problem of Short-Termism in Probability

Presenter: David Kong, Commerce and Mathematics
Faculty Presenter: Dr. Peter Taylor, Mathematics

In the game of *Skunk* a pair of dice is rolled again and again and as long as you remain "standing" you can keep adding the totals to your score. At any time you can "sit" and then you take home what you have won. However if you are standing and a "one" comes up on either die, the game is over and you lose everything. An optimal strategy is traditionally developed by comparing the expected score of standing with the expected score of sitting. As long as E(standing) > E(sitting), you would continue to roll the dice. As you accumulate points, you begin risking more points. At one point it becomes too risky to go forward. However, we found this traditional methodology to be flawed (though the answer remains the same). This solution focuses only on the expected score in the next roll, instead of factoring in the expected total score that can be gained over indefinite future. The error does not come to light until we analyze a variation where you are also allowed to choose the number of dice to use. All the equations (using the idea E(standing) > E(sitting)) we solved led us down a misleading and often intractable road. Yet, through reasoning, we figured that there is no strategy better than throwing 1-dice at a time. Proving this is quite difficult, because it had to be shown that the pure 1-dice strategy is better than all of the other (infinite) strategies, since the game can go on forever.

The Transient Receptor Potential Vanilloid Type 1 Ion Channel in Hypometabolic Response to Hypoxia

Presenter: Brian Foo, Life Sciences
Faculty Supporter: Dr. John Fisher, Physiology

When challenged with low levels of available oxygen (hypoxia), larger mammals, including humans, attempt to maintain a consistent oxygen supply by increasing their rate of respiration. Smaller rodents and newborn mammals, on the other hand, respond to hypoxia by curtailing oxygen consumption. This latter process (hypoxic hypometabolism) involves actively regulated reductions in both metabolic rate and body temperature (3; 4; 9). Despite more than 50 years of investigation, the molecular mechanisms of this intriguing process are still unclear. Recently, the transient receptor potential vanilloid type 1 (TRPV1) receptor (best known for its response to capsaicin) has been implicated in the regulation of body

temperature (5). Evidence includes the ability of TRPV1 receptor agonists and antagonists to lower and raise body temperature respectively (6; 7), as well as a demonstrated site of action within the hypothalamus (the area of the brain responsible for the regulation of body temperature) (1; 2). Based on the parallel but separately identified roles of hypoxia and TRPV1 in controlling body temperature, we reasoned that the TRPV1 ion channel may be implicated in hypoxia-induced alterations in body temperature. This present study investigates the potential involvement of the TRPV1 ion channel in hypoxia mediated hypothermia by comparing the hypoxic responses of wild-type mice and transgenetic knockout animals lacking a functional TRPV1 gene. We hypothesize that the TRPV1 knockout animals will show a blunted hypothermic response to hypoxic challenge.

The Latrine in the Roman Bathhouse at Humayma, Jordan

Presenter: Craig Harvey, Classics
Faculty Supporter: Dr. Barbara Reeves, Classics

In the summer of 2010 an archaeological excavation, under the direction of Dr. Reeves of the Classics Department at Queen's, uncovered the remains of a latrine at the Roman site of Humayma, Jordan. This latrine was part of a larger bathhouse which was associated with a nearby Roman fort. Typical of Roman latrines, the one at Humayma was a large room with seats for up to seven people built over a waste channel. The latrine also had a smaller channel for personal cleaning after using the latrine. Both these channels were fed from overflow water from the bath. This paper examines the latrine in relation to similar Roman facilities in the Near East. The paper also looks at the larger picture of the latrine's place in the complex system of water management and use implemented by the ancient inhabitants of the Jordanian desert. Comparative research reveals that the latrine at Humayma followed typical designs of latrines in the Roman Near East. Similar features from other sites also allow for the development of theories regarding archaeological features no longer extant in the latrine at Humayma. The construction of the facility shows to what extent the Roman garrison influenced local building and the presence of a drain hints at the reusing of water vital for survival in the desert at Humayma.

Session III: Identity & Nationhood

Speaker's Corner, Queen's Learning Commons, Stauffer Library
Thursday, March 10, 1:30-3:30
Moderator: Mr. Robert Burge, Registrar, Education

The Pen and the Spade: Gerrard Winstanley and the Digger Movement

Presenter: Renata Colwell, History
Faculty Supporter: Sarah Waurechen, History

In the wake of the English Civil Wars of the 1640s, increased religious tolerance gave rise to unprecedented religious radicalism. While most emerging religious sects adopted unorthodox interpretations of the Bible, some sects were more radical than others. The Diggers, led by Gerrard Winstanley, were unique in that their biblically inspired focus on private property's inherent corruption drove them to establish an agricultural commune in Surrey in 1649. By setting an example for the rest of the world and encouraging others to adopt their methods, they hoped to ultimately restore the Earth to a state of 'Common Treasury.' Drawing on scriptural precedent and personal interpretation of the Bible, Winstanley offered an eloquent, politically charged justification for the Diggers' program of communal living in *The True Levellers Standard* (1649), which became the Digger manifesto. It pointedly critiqued seventeenth-century English society, had both a positive and negative impact on the Diggers' reception at the time, and survived the movement's violent suppression and subsequent collapse. Today, it continues to offer great insight into the origins, development and fate of the Digger movement, while at

the same time inspiring modern scholars to delve deeper into the movement's significance, and raising questions about property and equality that remain highly relevant in this day and age.

Borders, Ideology, Geography and Maps – The Case of Israel

Presenter: Evan Perlman, Geography (Human)
Faculty Supporter: Dr. Anne Godlewska, Geography

Although there are dozens of countries with present day border disputes, few have received such unrelenting international focus as Israel. Maps, cartography and geographic education support the developing doctrine of national boundaries that form collective national identity and ideology. Geographically, throughout the past century, the borders of Israel have become a melding of the phenomena of national identity with physical territory – also referred to as territorial socialization. My paper argues that Israel's use of geographic description of borders specifically through cartography over time is an example of how boundaries are a powerful tool in the naturalization of ideology of Jewish Israelis. This argument is analyzed by examining historical and biblical cartography, territorial evolution, geography curriculum and textbooks, the Atlas of Israel and mental mapping by citizens. Varying portrayals of Israel's historical, biblical, natural and political boundaries creates an ambiguous definition of Israel's borders for citizens. In turn, this importantly shapes the present day religious and secular geographies of the population of Israel as well as the political behaviours by the democratically representative Israeli government.

Decolonizing Libraries, Archives and Museums: Communicating Partial Perspectives and Multiple World Views

Presenter: Romany Craig, Gender Studies

Libraries, Archives and Museums are interesting institutions as they share common goals of preserving and providing access to 'knowledge.' This knowledge, however, is not neutral. The history of these institutions began in the 'West' as a nation building project meant to solidify notions of superiority over 'other' nations and peoples. The processes involved in selecting what knowledge and artifacts are worthy of preservation and are thus available to the public, provide insight into who is valuable to the nation and what knowledge is legitimate. The colonizing function of these institutions is evident as they alienate, silence, stigmatize and erase the lives of indigenous peoples. Yet, this need not be the case. For professionals in these fields, decolonizing these spaces involves more than simply making note of best practices for indigenous peoples as a new user group. Continued involvement in a process of decolonization must begin with the acknowledgement of multiple valid world views and multiple valid ways of knowing.

Nation-Building Through Language Policy: The Chinese Experience

Presenter: Tabitha Daly, History and Linguistics

In 1808, the German Romanticist Johann Fichte contended that "men are formed by language far more than language is formed by men." Following this and understanding that language is closely tied to personal identity, to what extent can language become a means to influencing identity and, through that, influencing actions? This presentation will look at the role that language played throughout twentieth century China by focusing on how language was employed as a nation-building instrument in China's transformation from empire to nation-state by promoting a common identity where previously none had existed. This study looks at the case of China for it presents a continuous group of people affected by three different governments in less than a century, who experienced three different nation-building campaigns, where three different sets of language policies were applied. By looking at the language policies and planning during the Republic of China from 1912-49, the Maoist People's Republic

of China during the 1950s, and the shift in policy in the 1970s and 1980s with Deng Xiaoping, I examine how and why language policy changed and how successful the policies were in affecting an idea of nation and national identity amongst China's populations. By studying the motivations, aims, and consequences of language planning this study leads to an understanding of why nations engage in language planning and acknowledges the power, or lack thereof, that deliberate language reform and policy can have in initiating greater social and political change.

Dear Mubarak, *Irhal* means *Imshi*: Analyzing the Relationship Between Arabic Regional Dialects and Modern Standard Arabic

Presenter: Gretchen McCulloch, Linguistics

In most Arabic-speaking nations, almost everyone speaks two distinct but related dialects, an informal dialect unique to a particular region such as Egyptian or Jordanian Arabic, and a more formal variety found across the Arabic-speaking world, known as Modern Standard Arabic. This common dialect is maintained despite pressure from the regional dialects in large part because of the prestige that Classical or Koranic Arabic has among Muslims, in addition to the practical benefits of being able to communicate across regional boundaries. However, this continued bidialectism also has interesting linguistic implications, in terms of how the use of one dialect or another can reflect social and political realities both through history and in the modern world. For example, one sign in the recent Egyptian protests read "*irhal* means *imshi*," (roughly, "go away" means "beat it"), pretending to translate between the two dialects to reinforce the protester's message to Mubarak. This presentation draws from a variety of sources, including recent Middle Eastern politics and theories of structural and historical linguistics to examine how regional dialects of Arabic and the standard interact with each other.

Social Class and the Family Compact: the Class System in the Cataraqui Townships, Ernestown, and Kingston from 1791-1820

Presenter: Peter Holdsworth, History
Faculty Supporter: Dr. Peter Campbell, History

Abstract: Scholars have often assumed that the Upper Canadian social class system was shaped by a hierarchical and landed patronage system known as the Family Compact. Based on the views of Bishop John Strachan and Lieutenant Governor John Graves Simcoe, this Family Compact is viewed as a post-War of 1812 development and is said to replace the oligarchy that was in place in 1791. An examination of the Loyalist settlement townships, in particular Ernestown Township and the Cataraqui Townships, suggests instead that a mercantile aristocracy of patronage and wealth existed by 1791, including Richard Cartwright Jr. of Kingston, along with rural leaders such as the Fairfields and Parrotts of Ernestown. This study of a key and complex time and place challenges prevailing views on class and class consciousness in Upper Canada and refines our understanding of this society. Such an investigation is timely given both the seeming unwillingness of historians to fully challenge existing depictions of the Upper Canadian class system, despite their noticeable flaws, and the impending commemorations of the War of 1812. Using archival documents (accounts and letters) relating to two Loyalist/merchant families (the Parrotts and the Fairfields) along with a re-interpretation of secondary sources, a new view of a "Merchant Compact" is explored. This approach encompasses the changing relations of the settlements in question (Ernestown/Bath and Kingston) and shows the importance of previously neglected figures such as James Parrott. More broadly, it contributes new layers of analysis to the discussion of class consciousness in Upper Canada.

Session IV: Listening [aka Do You Hear What I Hear?]

Stauffer Library 121, Queen's Learning Commons, Stauffer Library
Thursday, March 10, 1:30-3:30
Moderator: Dr. Jackie Davies, Philosophy, Gender Studies

Effect of Temporal Arrangement on Multimedia Learning

Presenter: Victoria Chen, Psychology
Faculty Supporter: Dr. John Kirby, Education

The purpose of this study is to examine whether *Multimedia learning theory* (Mayer, 1997; Schnotz & Kürschner, 2007) holds true when images are the primary source of information and text information is secondary. I will test how temporal arrangement of audio and image presentations affects quality of learning in this situation. I hypothesize that when audio is played *before* or *after* the image participants will require increased cognitive processing to mentally integrate the two sources of information resulting in deeper learning and transfer of learning. On the other hand when audio is played *while* the image is shown, I hypothesize that participants with high prior knowledge of the subject will score lower than participants with low prior knowledge, because prior knowledge will interfere with knowledge from the two sources causing a redundancy effect. This experiment will lead to greater understanding of multimedia teaching and learning in classrooms as well as how it affects deeper learning.

Music Engagement Questionnaire Development for Individuals with Dementia or Other Cognitive Impairments

Presenter: Tina Poon, Psychology
Faculty Supporter: Dr. Lola L. Cuddy, Psychology

Previous literature has shown the importance of music engagement in everyday living, particularly for regulating emotions and enhancing the quality of life. However, the benefits individuals derive from music vary based on degree and method of use. Current measures of music engagement are designed for healthy populations and rely heavily on introspective self-report. Unfortunately, special populations with cognitive deficits, such as dementia patients, cannot accurately report introspective emotions and mood. Thus, there is a need for a more concrete behavioural-based measure suitable for reporting by a third party. The current study addressed these issues by developing a music engagement questionnaire suitable for dementia patients. The questionnaire will be tested with a large sample of adults with a range of ages. Furthermore, the questionnaire will undergo statistical analysis to determine validity and reliability. The result will be a measure of music engagement suitable for use with participants who suffer from dementia or other cognitive disorders.

Sibilant Harmony in Kinyarwanda

Presenter: Anthony Brohan, Linquistics

Kinyarwanda is a Bantu language spoken in Rwanda which exhibits puzzling alternation of the past-participal morpheme, which in certain contexts triggers sibilant harmony. Sibilant harmony is part of the broader class of consonant harmony, which has presented challenges to phonological theories. This presentation will present a sketch of Kinyarwanda phonology along with an analysis of sibilant harmony exhibited in Kinyarwanda under an autosegmental framework using mutation morphology. Finally, dialectical variation in sibilant harmony will be considered, comparing the Conogolese dialect with the Kigali dialect.

How Looking While Listening Affects Speech Segmentation

Presenter: Jaime Leung, Psychology
Faculty Supporter: Dr. Stanka Fitneva, Psychology

This study looks at the mechanisms behind how people learn words of a new language. Syllables that occur within words have a higher chance of occurring together than the syllables between words. Both infants and adults use these transitional probabilities to extract the words in language. However, previous research has examined speech segmentation when learners are presented just with speech. In natural context, we look while we listen and what we see is correlated with what we hear. The goal of my study was to explore how visual context affects adult speech segmentation. To do so, we have three conditions: one where adults were presented with only a word stream, one where while listening adults saw animations that corresponded to words they heard, and one where the animations that the adults saw did not correspond to the words they heard. One hypothesis is that participants in the audio-visual conditions perform better at the segmentation task because the statistical boundaries in the audio are reinforced by the visual boundaries between animations. However, it is also possible that the visual information impairs performance because learners engage in learning the meanings of words in addition to speech segmentation. Preliminary results support the latter hypothesis.

The Effects of Contextual Priming on the Intelligibility of Semantically Ambiguous Degraded Speech

Presenter: Avanti Dey, Psychology
Faculty Supporter: Dr. Ingrid Johnsrude, Psychology

A significant problem in the area of speech perception is that noisy listening environments often make it difficult to understand what is being said. Furthermore, speech overwhelmingly contains ambiguous words that carry multiple meanings, which can make speech comprehension even more difficult. Previous research has found that spoken sentences containing ambiguous words (e.g. "the woman was told that the *mint* was used for making coins") are harder to understand in noise than matched sentences without such words; we call this phenomenon the "ambiguity effect". The current study examined individuals' understanding of speech in noisy environments when this speech contains ambiguous words, and how context can influence this understanding. By manipulating the context in which sentences are presented, I examined whether listeners' interpretation of the sentence can be biased towards a particular meaning, thereby affecting intelligibility. Participants listened to noisy sentences, each of which was preceded by a priming word intended to provide a particular context to the sentence. Two main predictions follow from this study. First, I predict that listeners will be able to understand less from sentences that contain ambiguous words, compared to those that do not. Furthermore, I predict that the priming words will be of greater benefit (particularly *related* primes) to listeners in understanding sentences with ambiguous words, rather than sentences without ambiguous words. Preliminary findings will be discussed in the presentation. This work will contribute to the current literature concerning how we use semantic information to understand speech in challenging listening environments.

Do Dogs Know Their Owners Are Coming Home?

Presenter: Andrea Prins, Biology and Psychology
Faculty Supporter: Dr. Christoph Richter, Biology

A common perception among dog owners is that their pets seem to anticipate the arrival of a member of the household. Surveys in Britain and the US have shown that between 45 and 52% of dog owners have noticed this kind of behaviour. People often ascribe this phenomenon to telepathy or a sixth sense but there may be more conventional explanations. The dog could be hearing or smelling its owner approaching, predicting the owner's arrival based on a routine schedule or picking up on subtle cues from

people at home who know when the absent person is returning. In order to control for these alternative hypotheses, a time-coded video camera will record the dog's behaviour during the owner's absence. The data will be analysed by someone who has no foreknowledge if and when the owner is arriving. The data will be divided into the pre-return (control) and return periods. The return period will begin once the owner departs for home. Other people in the house will have no idea what the owner is doing in order to control for subtle cues. To eliminate the possibility of hearing/smelling its owner, the dog should be capable of reacting at least 10 minutes in advance of the owner's arrival. We will measure whether there is a statistically significant difference in anticipatory behaviour between the pre-return and return periods. If it is higher for the later, this experiment would support the hypothesis that dogs are sensitive to their owners intentions, even over long distances.

Session V: Sex, Power and Punishment

Speaker's Corner, Queen's Learning Commons, Stauffer Library
Thursday, March 10, 3:45-4:45
Moderator: Dr. Susan Wilcox, Gender Studies, Education

Public Perception of Sexual Offence: A Comparison

Presenter: Cody Sebben, Psychology

Studies show that, given the opportunity, most people would punish perpetrators of sexual assault more severely than those who commit other personal injury offences (Roberts, 1990). This study will attempt to explain why most people would prescribe harsher punishment to sexual offenders. Participants will take part in answering one of two questionnaires for the purpose of data collection, each with control variables. It is hypothesized that specific factors play a role in the belief that sexual offenders are a greater threat to individual and public safety than other offenders. These hypothesized factors include: risk to individual and public safety, lack of understanding with regard to sexual offences, belief that the offender has a greater likelihood to reoffend than non sexual offenders, and perception that treatment for sexual offending is not effective. Results from the study are anticipated to help explain why sexual offences are often thought to be more deserving of punishment than most other offences. It is anticipated that results will assist in providing a more complete understanding of sexual offences, both in public perception and in treatment.

The Rape Epidemic: The Weaponization of Sexual Violence in African Conflicts

Presenter: Samantha Jenkins, Political Studies and History
Faculty Supporter: Dr. Andrew Grant, Political Studies

Rape and sexual violence in an African context have transitioned from opportunistic individual attacks in the background of weak states and judiciaries, to systematized, strategic tools of war targeting specific civilian communities – so much so that "during wartime, it's often more dangerous to be a woman than to be a soldier". This sexual violence includes rape, mutilation, molestation, forced incest, and sexual enslavement, and is being employed not only by rebel groups, but also by state security forces and militia. The victims of sexual violence include all genders and age groups targeted as a result of various political, economic and social objectives. These objectives have included: boosting troop morale; and political intimidation or humiliation; revenge; ethnic cleansing and disruption of reproduction; spreading terror to induce a community into leaving its land. The emotional, physical, psychological and social affects of the rape pandemic are staggering. This presentation will examine three pertinent case studies of conflicts where sexual violence was/is widespread – the civil war in Sierra Leone; the Second Congo War in the Democratic Republic of Congo (DRC); and the current genocide occurring in the Darfur region of Sudan. These examinations will illuminate how sexual violence has been and can be used for different ends and the ramifications of this new weapon. This presentation will also review the role the

international community has played in discouraging sexual violence. Based on these analyses, this presentation will demonstrate that sexual violence is a potent tool of war because of its versatility of use and devastating ramifications, and that its prevalence in Africa is promoted by the subordinated position of females in both African culture and the international system generally.

Performing the Rainbow Nation: The Limitations of South Africa's Truth and Reconciliation Commission

Presenter: Lauren Sampson, History
Faculty Supporter: Ralph Callebert, History

After the dismantling of the apartheid regime in 1994, South Africa was charged with acknowledging the sufferings of its populace while democratizing and de-racializing state infrastructure. Instead of pursuing the politically expedient path of collective amnesia, a Truth and Reconciliation Commission was formed in 1995. It has since been heralded as the most ambitious and organized socio-political endeavour to confront a troubled and divisive history. The Commission attempted to initiate South African into a new future predicated upon the principles of social justice, the rule of law and reconciliation; however, this paper will argue that in practice, these ideals were not sufficient to combat extant political pressure and were not politically supported by any concrete mechanism capable of catalyzing social transformation. Through an analysis of the Commission's provision of amnesty, dismissal of institutional responsibility for apartheid and crime and the reluctance to pursue reparative and developmental policies, this paper will suggest South Africa's attempts to bridge its racial divides were chiefly symbolic and restricted. Finally, it will consider whether the TRC's performance of "truth" occurred at the price of reconciliation and the ramifications for restorative justice as a tool of social healing.

Session VI: To Market…

Stauffer Library 121, Queen's Learning Commons, Stauffer Library
Thursday, March 10, 3:45-4:45
Moderator: Dr. Vicki Remenda, Geological Sciences and Geological Engineering

Analysis of the Organic Beef Markets in Ontario and Alberta: A Case Studies Comparison

Presenter: Kyra Freeman, Geology SSP Environmental Science
Faculty Supporters: Dr. Gary vanLoon, Chemisty, Environmental Studies; Dr. Jane Webster, Business, Environmental Studies

Consumers are increasingly interested in paying a higher premium for alternative food, such as natural and organic products and governments are increasingly interested in sustainable agricultural practises that preserve the ability of future generations to produce food. The organic movement is continually growing due to consumer health and environmental concerns. This study focuses primarily on the evolution of the organic beef sector in Canada, focusing on two case studies: the MD of Pincher Creek No. 9 in Alberta and Frontenac County in Ontario. By interviewing stakeholders in the organic beef industry in both regions and supporting the stakeholder accounts with a literature review, comparisons were made pertaining to the viable market options that each region faces. Alberta is one of the leading producers of organic beef in the country, while Ontario produces much less, but Alberta has a lower level of organic consumers than Ontario. This leads to the need for Alberta producers to market their beef elsewhere, in British Columbia and the United States. Frontenac County has much more access to urban markets with high levels of organic consumer activity and thus have an easier time logistically in the selling of their beef. These two cases represent contrasting market and policy needs though regulation and certification requirements are nation-wide.

Financing From the Perspective of Mining Companies

Presenter: Eric Low, Mining Engineering
Faculty Supporter: Jim Martin, Mining Engineering

The purpose of this thesis is to explain financing decisions from the perspective of mining companies. First, all of the major equity and debt financing instruments available to mining companies are presented and analyzed. Each financing method is assessed on a wide range of criteria. Next, these concepts are applied in case studies of four companies: BHP Billiton, Barrick Gold, Teck Resources, and Noront Resources. For each company, the overall choice of financing methods is shown and analyzed. The effect of financing choices on the weighted average cost of capital (WACC) is calculated. The final section deals with case studies of individual mine finance decisions during the past two years: Teck Resources' $4.2 billion private debt placement to escape from the brink of bankruptcy, Barrick Gold's $3.9 billion equity financing to eliminate hedges, Copper Mountain Mining's Joint Venture with Mitsubishi, and Xstrata's $5.9 billion rights issue in 2009. The financing options used by mining companies can be divided in 16 types, many of which are unique to the mining industry. Public equity is the dominant form of financing, followed by bonds and debentures, while many newer types of financing are growing in importance. Important considerations for selecting the type of financing include: time needed to arrange, typical interest rate, position in capital structure, effect on balance sheet, effect on credit rating and equity dilution. In many cases, the best form of financing is highly contentious. Large companies that are able to obtain good credit ratings are able to achieve a lower cost of capital than their junior counterparts, while gold companies currently enjoy the lowest cost of capital.

Detection of Visually Cued Faults in High Speed Automation

Presenter: Kevin Hughes, Mechanical and Materials Engineering
Faculty Supporter: Dr. Brian W. Surgenor, Mechanical and Materials Engineering

Manufacturers are experiencing ever greater pressures to meet a multitude of business demands: boost production rate, increase yield, improve quality and reduce operating costs, etc. One important measure of success is the ability of automated manufacturing processes to run fault free for extended periods of time. When faults do occur, they must be detected, diagnosed and corrected quickly. High speed automated assembly machines typically employ many different types of sensors to monitor machine health and feedback faults (both cautionary and reactionary) to a central controller for review by a technician or engineer. This paper describes progress with a project whose goal is to examine the effectiveness and feasibility of using machine vision to detect 'visually cued' machine faults in high speed automation equipment. Machine vision is commonly used in manufacturing to perform a 'process' role such as part quality inspection. Machine vision systems use cameras to capture images of parts in a manufacturing process. Computer software packages use custom algorithms to analyze these images, and determine the quality (or even presence) of the part based on physical characteristics including part geometry and colour. If machine vision were successfully applied as a fault monitoring system, it could effectively reduce the amount of sensors needed to monitor the machine's operation, as a single camera could monitor several locations where known faults occur. The intent is to not only reduce the amount of sensors required to effectively monitor a machine, but to make the machine 'smarter' by enriching the data used for fault detection.

Session VII: Response to Disease

Speaker's Corner, Queen's Learning Commons, Stauffer Library
Friday, March 11, 9:30-11:30
Moderator: Dr. Jill Atkinson, Psychology

Prostitute or Parasite: The Entanglement of Scientific and Social Victorian Discourses

Presenter: Michelle Hunniford, Biology, English

Where does scientific inspiration come from? How does society determine its identity? Biology acts as a source for social metaphor, just as society can be the catalyst to drive scientific discovery. Though the word "parasite" has its origins in Greek drama, it became popularly associated with biology with the advent of the microscope. The story of the "parasite" is complicated by the frequent adoption of biological language to describe society and reinforce constructed social hierarchy. Prostitutes, as a group, are socially "parasitized" in the 19th century largely because of the threat of rapidly spreading venereal disease. The Contagious Diseases Acts, passed from 1864-1869, were a drastic medical solution to a problem that could have been more easily solved through milder social reforms. The primary motivation seems to be a fear of contagion, class mixing, and the weakening of the empire. Both the unseen biological parasite and the prostitute or "social parasite" act as threatening forces in the Victorian mind. The language of primary social and scientific literature from the 19th century shows each discourse being influenced by the other in an inextricably entangled way.

Containing Disease and Disaster: The Role of Hôtel Dieu of Montreal during the Smallpox Outbreak, 1885

Presenter: Brigid A. Hayek, History

In 1885 an outbreak of smallpox threatened the health of Montreal citizens. This prompted Montreal and Quebec health officials to implement a plan of action to contain the disease and ward off disaster. Ideally the health officials intended on reopening quarantine centres located throughout the city, however, these facilities were not ready to service the outbreak. The quarantine facilities required medical equipment and supplies as well as the staff necessary to oversee patient care; neither of which could be re-established within the small window of opportunity health officials had to intervene. Their alternative solution was to convert Hôtel Dieu of Montreal from a general hospital to a specialized smallpox facility. This decision resulted in Hôtel Dieu transferring all patients who still required medical attention, but did not exhibit smallpox symptoms to other hospitals; while allowing the remaining patients to rejoin the general public. The decision to transfer or release all unrelated smallpox cases had serious implications, contributing to 9600 people contracting the virus as well as the death of 3234 Montrealers. It was apparent that the virus had been seeded throughout the city on account of the health official's actions, but what was more troubling is that their actions indicate that they went against popular medical practices which would dictate against the transfer or release of patients. So the question remains, why did the health officials choose the course of action they did?

Theory and HIV/AIDS: Investigating Disability Theory as a New Conceptual Framework for HIV and AIDS-Related Stigma

Presenter: Tim Wyman-McCarthy, English major, History minor
Faculty Supporter: Dr. Rosemary Jolly, English

The title of Paula Treichler's 1999 book, *How to Have Theory in an Epidemic*, raises an important question: is it possible, moral, or even useful to approach *theoretically* an event as real and as devastating as the

HIV and AIDS epidemic in South Africa? This presentation will investigate the way in which existing attempts to theorize HIV and AIDS-related stigma have been seen as inadequate, and how the newly emerging strand of critical theory known as 'disability studies' may provide a particularly useful vocabulary by which to discuss the stigmatization of those living with HIV or AIDS. This line of inquiry leads to a number of further questions: What is the relationship between disease and disability? Is it fair to approach an issue as complicated as HIV and AIDS-related stigma through one theoretical lens, or is an interdisciplinary approach linking Health Studies, Queer Theory, Postcolonial Theory, and Disability Theory necessary? And finally, what are the *useful* implications of linking Disability Theory with the study of HIV and AIDS-related stigma? The presentation will approach these questions by placing into relationship critical work from anthropology, disability studies, health studies as well as creative work in the form of Siphiwo Mahala's 2007 novel *When a Man Cries*.

Plague on Stage: Theatrical Depictions of AIDS and the Social Response

Presenter: Mark Rochford, Drama
Faculty Supporter: Dr. Jennifer Stephenson, Drama

Since AIDS emerged as a health threat in North America in the 1980s, many plays have been written with this disease as central to their plotlines, several to particular critical acclaim and warm audience reception. Tony Kushner's *Angels in America* is widely considered one of the theatrical masterpieces of the Twentieth Century, and Jonathan Larson's *Rent* remains, more than a decade after its first run on Broadway, one of the continent's most popular stage musicals. Recognizing that the body of AIDS plays represents a unique interaction between a specific disease and a specific art form, I investigate how the insertion of the theme of AIDS into the world of drama affected the way plays were written, and how the AIDS plays reflected and influenced popular attitudes toward the disease. For my thesis project I am in the process of surveying the portrayals of AIDS in North American plays written between 1985 and 2002, tracking variations in dramatic structure, style, staging techniques, imagery, metaphor, concurrent themes, and the characterization of persons with AIDS and medical professionals. "Plague on Stage" will address the factors that unite and define these plays beyond the thematic inclusion of AIDS, as well as the relationship between theatre and social discourse in terms of a contemporary plague, offering insights gleaned from the AIDS plays on how theatre can more effectively be used as a method of social healing.

Prostate Cancer and Ontario: An Analysis of Overdiagnosis and Biopsy Trends Across Ontario

Presenter: Matthew Lipinski, Life Sciences SSP Comprehensive
Faculty Supporter: Dr. Patti Groome, Community Health & Epidemiology, Oncology

Prostate Cancer is the most diagnosed cancer in Canada with 1 in 6 men being diagnosed with the disease over their lifetime. Despite the widespread use of early detection (in the form of PSA tests and prostate biopsies) previous studies have shown discrepancies in whether these efforts are effective in reducing mortality rates from the disease itself. Using data from Ontario healthcare databases, along with a survey sent to Ontario urologists, our study attempts to discern whether variations in prostate biopsy rates across Ontario correlate to prostate cancer incidence and/or mortality rates. This will provide a descriptive picture of biopsy practices across Ontario as well as shed insight on whether there is overdiagnosis occurring of prostate cancers which, if not detected, would not have affected the individual in their lifetime. The ICES database (which has access to various records like OHIP and Cancer Care Ontario) will be used to compare incidence, mortality, and biopsy rates for prostate cancer during the time period of 1994-1998 and 2003-2007. Additionally, 149 urologists in Ontario were sent a 10 scenario questionnaire attempting to discern their tendency to biopsy patients with more ambiguous test results. Final results will be available at the time of the conference. Current preliminary analysis

shows large variability across Ontario. Despite being the most diagnosed cancer in Canada, there seems to be wide variation in the behavior of urologists. Future policies should aim to standardize practices to ensure best possible care of patients.

A Study of Gas-Exchange Variability in the Hepatopulmonary Syndrome

Presenter: Dhruv Nayyar, Life Sciences
Faculty Supporter: Dr. Samir Gupta, University of Toronto

The hepatopulmonary syndrome (HPS) is a rare condition defined as the triad of cirrhosis, intrapulmonary vascular dilatations (IPVDs), and abnormal gas-exchange. Recently, there has been controversy in the scientific literature regarding the criterion for abnormal gas-exchange that should be used in this syndromic definition. Although current expert recommendations call for an alveolar-arterial oxygen gradient cutoff of >20 mm Hg (a low threshold cutoff), other authors have suggested higher threshold cutoffs. In our clinical experience, we have noted significant variability in the alveolar-arterial oxygen gradient over time among patients with possible HPS. Our objectives were to characterize and formally describe this variability in order to propose a new, more stable diagnostic cutoff. We analyzed longitudinal gas-exchange data over five years from 58 patients who were referred to the Toronto HPS Clinic. Each patient had an average of 4.19 visits on file. Using the expert recommended cutoffs, we found that 20.69% of patients fluctuate above or below the threshold for abnormal gas-exchange despite stability of clinical symptoms. Using a stricter two-visit partial pressure of arterial oxygen cutoff of <80mm Hg, no patients fluctuate above or below the cutoff. The stricter cutoff also has stronger correlations with clinical indicators of disease progress and severity. The currently recommended cutoffs for abnormal gas-exchange in HPS patients may not be the best threshold to establish a stable diagnosis and distinguish patients with respect to disease progress and severity.

Session VIII: Peers, Norms & Others II

Stauffer Library 121, Queen's Learning Commons, Stauffer Library
Friday, March 11, 9:30-10:50
Moderator: Dr. Sydney Eve Matrix, Film and Media

An Examination of Psychophysiological Sexual Arousal in Bisexual Women

Presenter: Monica Haberl, Psychology
Faculty Supporter: Dr. Meredith Chivers, Psychology

This study aims to gain an understanding of the sexual arousal patterns of women who have some degree of sexual attraction to both males and females. Women's genital arousal has been found to be nonspecific. That is, women have been found to show physiological arousal to stimuli depicting both their preferred and non-preferred gender (Chivers, Seto, & Blanchard, 2007). This previous research has examined arousal patterns of heterosexual and homosexual females but no research to date has focused on bisexual women. Bisexuality has been found to be more prevalent in women than homosexuality (Mosher, Chandra, & Jones, 2005); therefore, it is important to understand the arousal patterns of these women. In the current study, women's physiological and self-reported arousal will be measured as they view erotic videos varying by degree of sexual activity (e.g., naked exercising, masturbation, coupled intercourse) and varying by gender of the sexual actors. Based on past literature, I expect to find that both physiological and subjective arousal levels will increase as the level of sexual activity in the videos increases (e.g. greater arousal to intercourse than to masturbation). I also expect to find that the correlation between bisexual women's physiological and subjective arousal will be stronger than the concordance for either heterosexual or homosexual women. Finally, I expect frequency of masturbation, use of erotica, and sex toy use to be positively correlated with women's sexual arousal concordance (between physiological and subjective arousal).

Constraints on Children's Exploration

Presenter: Laurel Dault, Psychology
Faculty Supporter: Dr. Stanka Fitneva, Psychology

Children typically explore, that is, select information sources that are unfamiliar, during information-seeking; however certain variables can limit this exploratory behaviour. The study investigated children's likelihood to explore based on their representations of knowledge distribution. Knowledge distribution is the idea that information is spread differently across populations. Some information is commonly known (such as traffic laws), and therefore widely-distributed, whereas other subjects are less commonly known (such as laws of physics) and thus narrowly-distributed. People who know about narrowly-distributed areas of knowledge are classified as experts in that subject. In the experiment, 4-year-olds met an informant who correctly labeled objects from fields of knowledge that were either broadly-distributed or narrowly-distributed. Next, participants viewed another object from the same field of knowledge and could choose to seek help with labeling this object from either the familiar informant or a novel informant. Children's perceptions of the distribution of knowledge influenced their choice of an informant. These data suggest that children's representations of knowledge may restrict their exploration, that is, when they are dealing with what they perceive as a narrowly-distributed topic, they will presume the familiar informant is an expert on the subject and choose that informant to provide more information.

Response Conflict and Inhibition of Return

Presenter: Yena Bi, Psychology: Brain, Behaviour and Cognitive Science
Faculty Supporter: Dr. Daryl Wilson, Psychology

Much research has suggested that attention is biased away from previously attended locations-- a phenomenon termed inhibition of return (IOR). Traditionally, IOR studies use simple visual stimuli in detection tasks and employ a cue-target paradigm where a task-irrelevant cue is briefly presented followed by a target at either a cued location (same location as cue) or at an uncued location. Participants provide no response to the cue, but then produce a key press response upon target detection. When the stimulus onset asynchrony (SOA) is less than 300 ms, response to the target is facilitated by the cue; when the SOA is greater than 300 ms, response to the target is slowed at the cued location. The current study investigates different cue-target tasks and their effect on inhibition of return (IOR). We will conduct a between-subjects experiment with three conditions differing in response instruction. Target-only condition replicates the classic IOR study using a cue-target, detection task paradigm in which participants respond to the target but not the cue. Same-response condition requires participants to make identical responses to the cue and target. Different-response condition requires participants to provide a response to both the cue and the target, but the responses for the cue and target will differ. Together these studies help us understand the extent that IOR is caused by a motor response conflict as we compare the magnitude of IOR from the three testing conditions.

"Graphics, Social Movements, and the Race to Eradicate Abortion: Why America Will Take Gold"

Presenter: Zuza Kurzawa, Political Studies and Economics

Skeletal figures of Holocaust victims, wounds and scars of the enslaved, blackened lungs of the smoker; powerful images convey powerful narratives. Over the past century, media has become increasingly pervasive. For social movements, this tool played a key role in achieving mass societal change. Looking to mimic a lasting paradigm shift, pro-life groups have realized that images are the catalyst for change. Ignoring the normative element of abortion, it is important to acknowledge two common goals shared by the pro-life and pro-choice communities. First, both desire to help women. Second, both want to reduce

the number of abortions. The obvious disconnect, is the means under which both goals are met. However, over the past decade, the efforts of various 'Centres for Bio-Ethical Reform' have shown that one of the most effective methods in achieving both goals has been through graphic image campaigns. It will be argued that in order to help couples make informed decisions, and reduce the number of abortions, images of human development and abortion must be readily available to couples in crisis pregnancy. Using the findings and testimonies from the Centre for Bio-Ethical Reform Florida 2011 mission, it can be demonstrated that convictions about abortion change in face of graphic imagery. Because it does not overtly challenge current legislation, but instead decreases the number of abortions, it ought to be honoured by both parties. Under the protection of the first amendment, pro-life groups in America can freely share these images to encourage discussion. In Canada, 'freedom of speech' and 'freedom of expression' are often compromised in the face of adversity; conclusively the pro-life message is often silenced. Thus, by virtue of being able to share the reality of the procedure, Americans are leading in the race to eventually eradicate the perceived necessity of abortion.

Session IX: C & N: Carbon & Nitrogen

Speaker's Corner, Queen's Learning Commons, Stauffer Library
Friday, March 11, 1:00-3:20
Moderator: Dr. Neal Scott, Geography

Effects of Permafrost Disturbance on Trace Gas Flux in a High Arctic Ecosystem

Presenter: Alison Beamish, Geography
Faculty Supporter: Dr. Neal Scott, Geography

High Arctic ecosystems are likely to experience some of the earliest and most extreme changes in climate as a result of future global climate change. These changes will likely include both increases in temperature and precipitation. High-Arctic ecosystems are very sensitive to climatic disruption, and the response of these ecosystems to changes in climate could have a strong influence on future climate. In particular, changes in temperature and moisture will cause the active layer to deepen as a result of enhanced permafrost melting. This deepening will decrease stability in shallow slopes leading to soil disturbances known as active layer detachments.. We are exploring the impact of active layer detachments on net ecosystem trace gas (CH_4, N_2O and CO_2) exchange at the Cape Bounty Arctic Watershed Observatory on Melville Island. Eight plots were established in four different detachments, covering a range of disturbance intensities (control, disturbed and highly disturbed). Based on collected and analysed gas samples, it appears disturbance has an effect on trace gas exchange. Initial results show a distinct difference across the disturbance gradient. These findings have important implications if summer temperatures are to rise and disturbance frequency increases. Continued monitoring of these sites is important to assess the changes in trace gas flux over time since disturbance. Quantifying the impact of active layer detachments is crucial to furthering our understanding of the arctic carbon and trace gas cycles.

Nitrous Oxide Emissions From a Switchgrass Field Across a Fertilizer Gradient

Presenter: Daniel McParland, Geography
Faculty Supporter: Dr. Neal Scott, Geography

Switchgrass (*Panicum virgatum*), a perennial warm season (C_4) grass, is being integrated into agricultural systems throughout southeastern Ontario for bioenergy purposes. Environmental assessments of growing switchgrass for the region have yet to be adequately completed, including an assessment of the impacts of using nitrogen fertilizer as part of the management system. Use of nitrogen could lead to an increase in N_2O emissions. The objective of this work was to study N_2O emissions from switchgrass plots established across a nitrogen fertilization gradient. The site was located near Ameliasburg, ON, and field

gas fluxes were measured throughout the growing season in 2010. The field was divided into strips according to fertilizer (urea) application rate: 0, 50, and 150 lbs/acre. In each strip, four soil gas flux sample sites were established. Gas samples were collected from closed static chambers and analyzed using gas chromatography. N_2O emissions for all three applications were highest at the start of the growing season just after fertilizer application, and then decreased gradually throughout the growing season. Emissions from the 150 lbs/acre strips were highest on almost all of the sample dates. N_2O production was similar in the 0 and 50 lbs/acre plots. Differences in emissions between treatments were minimal at the end of the growing season. My results suggest that while higher rates of nitrogen application may stimulate growth of switchgrass, production of N_2O may offset additional productivity benefits when considering the overall benefits to the climate system of substituting switchgrass for fossil fuels.

Isotopic Signatures and Trace Elements Concentrations in Breast Feathers of Male Caspian Terns and Double Crested Cormorants

Presenter: Diana Flood, Biology
Faculty Supporter: Dr. Linda Campbell, Environmental Studies

Migratory fish-eating birds occupy the highest trophic positions of aquatic ecosystems and as such serve as invaluable end-point indicators of the presence and bioaccumulation of anthropogenic contaminants. The birds' main route of contaminant exposure is through food consumption. Migration can complicate this pathway by introducing numerous feeding habitats and thus, potential sources of contamination. Birds possess a number of depuration mechanisms that permit them to reduce their contaminant burden, namely the elimination of metals and mercury (Hg) through their feathers, feces and eggs. Trace element concentrations found in the feathers reflect the contaminants circulating in the body at the time of feather growth, representing local exposure and potential mobilization from internal tissues. Molt schedules and patterns are important considerations when selecting feathers to link feeding ecology with contaminants, as migratory birds' feathers grow on and represent different sites. Stable nitrogen (δ15N) and carbon (δ13C) and hydrogen isotopes (δD) can reveal feeding ecology and habitat use during their annual cycle. Consequently, anthropogenic and natural sources of metal accumulation can be linked to those ecological variables. This study will examine the assimilation of trace element in male Caspian Tern (Sterna caspia) and Double-crested Cormorant (Phalacrocorax auritus) breast feathers grown on wintering sites and stable isotope signatures will be used to determine origin of contaminants. The aims for this study are to determine (i) whether isotopic signatures of feathers grown on wintering sites can explain variations in feather trace element concentrations, (ii) whether isotopes can determine the source of contamination, and (iii) whether differences in trace elements between individuals are determined by location of wintering ground or species.

Chemical Vapour Deposition of Graphene

Presenter: Joelle Thorgrimson, Physics
Faculty Supporter: Dr. Robert Knobel, Physics

Write your name on a piece of paper with a pencil and you have just created the hottest new material in physics, namely graphene. Graphene is a single atomic layer of graphite arranged in a perfect network of repeating hexagons. It was discovered in 2004 by Andre Geim and Konstantin Novoselov, who received the 2010 Nobel prize in physics. Because of graphene's unique two-dimensional nature, it has a variety of interesting properties. For example, graphene's high crystal quality is the result of extremely flexible interatomic bonds, which create a substance stronger in plane than diamond yet allows planes to bend when a force is applied perpendicular to this plane. The current challenge in this area of study is to make uniform large area films of graphene. A promising method is chemical vapour deposition (CVD) on

metal substrates, particularly copper (Cu). An apparatus for CVD of graphene was built and tested. Using a variety of different experimental conditions, the growth of graphene was investigated. Scanning electron microscopy was used as a preliminary diagnostic tool to determine the presence of graphene. The graphene was then transferred from Cu onto silicon dioxide in order to image the sample using optical and Raman spectroscopy. These methods both confirmed that graphene is present. Further work is being done to optimize the growth and transfer methods as well as to test some of graphene's interesting electrical and mechanical properties.

Burn Baby Burn: Igniting a Plasma, and Properties

Presenter: Zach Zheng, Physics
Faculty Supporter: Dr. Alastair McLean, Physics

The purpose of the Flame Plasma experiment is to measure the electron density in an intensified propane flame. This is done by sweeping a Langmuir probe through the flame, and measuring the resulting current and voltage through it. The properties of the Langmuir probe and flame plasma are further analyzed. In the Flame Plasma experiment, a flame will be created with a lab-grade propane burner (this may need to be purchased, preferably one with a large diameter). The flame will only contain partially-ionized plasma, which means not all atoms are going to be stripped of their electrons. To create more uniformly-ionized plasma, a more intensified flame must be created. This can be done by "seeding" and intensifying the flame with "sodium" and "potassium" particles. This more uniformly-ionized plasma will contain a higher electron density. This is an important pre-requisite for the Langmuir probe for it to work well, and not acquire error-like readings and charts.

Sustainable Water Filters for the Developing World: A Focus on Cholera

Presenters: Andrew Krentz, Ryan Magowan, Liane Millington

The goal of this project is to design a point-of-use water filtration device constructed from locally available geological materials, which is capable of filtering out *Vibrio cholerae* bacteria. *Vibrio cholerae* occurs naturally in tropical seawater, as well as in human waste. It is a water-borne pathogen, and thus human populations are especially vulnerable during and after natural crises such as floods, tsunamis and earthquakes. The basic filtration unit uses readily available supplies including pop bottles, fabric (such as that from a T-shirt), and a geologic material, such as sand, clay or zeolites. Tests utilizing yeast as a surrogate for *Vibrio cholerae* are currently ongoing.

Smooth Surfaces of Constant Mean Curvature in Biology (Video Link)

Presenter: Christopher Laing, Mathematics & Statistics, University of Otago
Faculty Supporter: Dr. Jörg Frauendiener, Mathematics & Statistics, University of Otago

Differential geometry is concerned with the calculus of smooth surfaces. The field rose to prominence through its incredible power to describe Einstein's Theory of General Relativity, in which spacetime is considered to be a smooth four-dimensional manifold. More recently, differential geometry has been used to describe stress and strain for elastic bodies, in digital signals processing and in probability theory. Smooth surfaces appear in a variety of natural systems. This research focusses on the *salvinia* leaf, a floating fern whose skin has the unusual property that, when immersed in water, a stable, persistent air layer is retained on the surface of the leaf. This air-water interface is made possible by the phenomenon of surface tension and a forest-like structure on the surface of the leaf, which forms a 'tent' of air. This interface is a smooth surface that can be investigated using differential geometry, and has the particular property that it's mean curvature is constant. The equation of capillary pressure, developed in the early nineteenth century by Thomas Young and Pierre-Simon Laplace, governs the system. However, the

traditional formulation of the problem can be extremely difficult to solve. The project involved reformulating the Young-Laplace equation, a second-order nonlinear partial differential equation, in a coordinate independent fashion using differential geometry. Finite element analysis was then used to obtain numerical solutions for specific domain geometries. The ability to find domain geometries which form surfaces with specified properties will aid the design of effective bionic devices.

Session X: ...5678

Stauffer Library 121, Queen's Learning Commons, Stauffer Library
Friday, March 11, 1:00-3:00
Moderator: TBA

Body-Mind Centering: An Exploration in Achieving Somatic Awareness for the Classical Ballet Dancer

Presenter: Lee Sela, Drama
Faculty Supporter: Dr. Natalie Rewa, Drama

With each step and each breath a ballet dancer takes the body acts as a compass, guiding each internal discovery. The ability to maintain one's bearings can be achieved through the process and balance of Body-Mind Centering. This technique, founded by theorist Bonnie Bainbridge Cohen, journeys into the ever-changing territory of the human body by exploring thoughts, feelings, energy, and movement. Specifically, somatic awareness is reached through the exploration of bones, muscles, and organs. The method of research was generated in the following ways: Extensive research conducted in the field of anatomy and kinesiology, and an anatomy document created for future dancers to utilize prior to in-studio work. Next, a combination of Cohen's previously devised exercises and newly crafted exercises were put into practice in a studio setting. Both solo and group work was conducted, targeting specific groups of bones, muscles, or organs. Lastly, a journal was kept with all practical observations discovered, and a final document was generated to reveal and collaboratively synthesize the observations made. Numerous discoveries were made regarding the differences in the quality of movement alterations (internal vs. external), the movement of a trained ballet-body (urges and inclinations), as well as the methods of exercise exploration (improvisation vs. structure), and how each affected the types of movement generated by the dancer. Through both the discoveries and difficulties that arose during the research process, future options for study were generated, such as, in-studio workshops that explore the interaction and dialogue between multiple bodies.

Ready, Set, Go: Increasing Awareness of the Social Benefits of Being Active Among People with Spinal Cord Injury

Presenter: Julie Crowson, Kinesiology and Health Studies
Faculty Supporter: Dr. Amy Latimer, Kinesiology and Health Studies

Previous research has shown that presenting yourself as an "exerciser" through participation in physical activity (PA) can help alleviate stigma associated with having a disability. The purpose of this study is to explore whether brief messages emphasizing the social benefits of PA affect intentions to engage in PA among people with spinal cord injury (SCI). Ninety inactive adults with SCI will respond to a baseline questionnaire and will receive a message promoting the social benefits of PA over the telephone. In a two-week follow-up interview, affective and instrumental attitudes, intentions, and stigma consciousness will be measured. Data is currently being collected and preliminary results will be presented. It is hypothesized that messages promoting social benefits of PA will lead to more positive attitudes and increased intentions to engage in PA.

Effect of Various Intensities of Short-Term Interval Training on Oxygen Uptake Kinetics

Presenter : Alex Green, Kinesiology and Health Studies
Faculty Supporter: Dr. Brendon Gurd, Kinesiology and Health Studies
Co-Authors: N.J. MacMillan; B.J. Gurd

Oxygen (O_2) uptake kinetics reflect the rate at which an individual's oxygen consumption (VO_2) changes to meet a new metabolic demand, such as an increase or decrease in exercise intensity. O_2 uptake kinetics can indicate cardiovascular and metabolic fitness and are described by the time variable, τ (tau), of the exponential equation describing the change in VO_2. With training τ decreases, indicating a more rapid increase in VO_2 to meet the new metabolic demand. Interval training at supramaximal (>100% VO_{2max}) intensities has been shown to elicit similar improvements in O_2 uptake kinetics to traditional endurance training. This study looked to determine the optimal intensity of interval training for eliciting improvements in O_2 uptake kinetics. Fifteen recreationally active individuals (males: n=9, age = 23.3±3.3 years, VO_{2max} = 44.2±6.5 ml $O_2 \bullet min^{-1} \bullet kg^{-1}$; females: n=6, age = 21.5±0.7 years, VO_{2max} = 39.7±5.4 ml $O_2 \bullet min^{-1} \bullet kg^{-1}$) participated in 12 training sessions over 4 weeks. To measure O_2 uptake kinetics subjects completed three step transitions from loadless (~25W) to low work-rate (~80W) cycling, prior and following training. Each subject was randomly assigned to one of three intensities - high-intensity interval training (HIIT ~120% VO_{2max}), moderate-intensity interval training (MIIT ~90% VO_{2max}), and low-intensity interval training (LIIT ~65% VO_{2max}). Each session consisted of 8-12 intervals of 1-minute duration with 1-minute recovery on a stationary bicycle at the prescribed relative intensity. No significant differences between groups were observed in changes in τ (Δτ: LIIT: 3.1±8.3s; MIIT: -0.59±12.4s; HIIT: 6.2±6.0s).

Determining the Optimal Interval Exercise Intensity Dose for Improving Exercise Performance

Presenter: Norah MacMillan, Kinesiology and Health Studies
Faculty Supporter: Dr. Brendon Gurd, Kinesiology and Health Studies
Co-Authors: A.E. Green; B.J. Gurd

Short duration interval training is a time-efficient exercise strategy that can improve fitness through changes in metabolic, cardiovascular and performance related variables. Studies have examined the positive effects of maximal intensity exercise (≥100% VO_{2max}) on metabolic and performance variables in recreationally active individuals and trained athletes. The intensity of interval training required to cause improvements in aerobic fitness is unknown. This study will look at the performance related adaptations that occur with three different exercise intensities of interval training matched in terms of duration, frequency and type of exercise. Sixteen recreationally active individuals, both males (n=9, age = 23.3±3.3, VO_{2max} = 44.2±6.5) and females (n=6, age = 21.5±0.7, VO_{2max} = 39.7±5.4) were randomly assigned to one of three groups who trained using intervals at 120% VO_{2max} (n=5), 90% VO_{2max} (n=4) or 65% VO_{2max} (n=7). The participants performed 14 days of training spread over 4 weeks that consisted of 8-12 repeats of 1-minute cycling at the prescribed intensity with 1-minute active recovery between intervals. Training increased time to fatigue in the 90% VO_{2max} and 120% VO_{2max} group however not in the 65% VO_{2max} group. The changes in VO_{2max} before and after training were significant in the 90% VO_{2max} group and the 120% VO_{2max} group, however not between the 120% VO_{2max} and 90% VO_{2max} group ($p \leq 0.05$). Interval training at 90% and 120% VO_{2max} stimulates analogous improvements in fitness. These results may be important for diseased or sedentary populations where very high-intensity and long duration exercise may not be well tolerated.

Navigating the "Brawn Drain": Canadian Student-Athlete Experiences in the U.S. and Canada

Presenter: Lindsey Griffith, Kinesiology and Health Studies
Faculty Supporter: Dr. Samantha King, Kinesiology and Health Studies
Co-Authors: Arlinda Ruco, Meagan Heard, Samantha King, Robert Millington

There is an abundance of research on athletic scholarships and the experiences of college athletes (Duderstadt, 2000; Herbert, 2004; Miller & Kerr, 2002; Paskey, 2000; Sack & Staurowsky, 1998; Schofield, 2000; Shulman & Bowen, 2001). However, since much of this work has focused on the U.S. context, there is a scarcity of literature pertaining to the experiences of Canadian student-athletes. This study explores what is known as the "brawn drain"—the apparent movement of Canadian student-athletes to the U.S.--and compares their experiences with those who remain in Canada. In- depth, open-ended interviews with Canadian student-athletes at U.S. universities revealed that on the one hand, these athletes endured arduous training regimes, an increased pressure to perform athletically, and a higher value placed on athletic performance that at times compromised their academic priorities. On the other hand, interviewees noted their satisfaction with superior training facilities and the opportunity to continue to compete at a high level, benefits that they felt were not available in Canada. Our analysis is contextualized within the recent debates among and beyond Canadian Interuniversity Sport on the possibility of raising the annual cap on athletic scholarships in Canada (Paskey, 2000).

Exploratory Study of the Relationship Between Maternal Body Mass Index and Spontaneous Fetal Movements

Presenter: Wei Ning (Will) Jiang, Nursing
Faculty Supporter: Dr. Barbara Kisilevsky, Nursing, Obstetrics & Gynaecology, KGH

Maternal body mass index (BMI) has been reported to be associated with the number of fetal body movements and the duration of fetal breathing movements in hypertensive pregnant women (Brown et al., 2008). However, whether a relationship exists in pregnancies classified as overweight or normal weight but not complicated by hypertension is unknown and the focus of this study. Forty-five maternal-fetal pairs (normotensive, normal weight=15; normotensive, overweight=15; hypertensive=15) who had participated in a study of fetal behavior which included a 20 min real-time ultrasound scan observation of fetal movements were randomly selected from the laboratory archival database. Gestational age at testing ranged from 33-39 weeks [*M*(*SD*)= 36.2 (1.4) weeks]. All infants were delivered healthy at term. Video-recordings of the ultrasound scans were scored for the number of fetal body movements (interrater reliability r=.97) and the cumulative duration of breathing (interrater reliability r=.94) movements. The number of fetal body movements differed between groups, $F(2,38)=3.19$, $p=0.05$, with fetuses of overweight mothers moving less frequently than those of normal weight mothers (*M*=9.7 vs 15.5, respectively). Maternal BMI prior to pregnancy, $r=-0.43$, $p<0.01$, and at time of observation, $r=-0.44$, $p<0.01$, was associated with the number of fetal body movements, but not with duration of breathing movements. As BMI increased, the number of fetal body movements decreased. It was concluded that maternal BMI may affect the number of spontaneous fetal movements. A prospective study is necessary to determine whether BMI should be considered when using body movement counts to assess well-being and/or neurodevelopment.

POSTER PRESENTATIONS

Session XI: Poster Presentations

Queen's Learning Commons, Stauffer Library
Presenters will be present at posters Friday, March 11, 11:30-1:00
Posters will be on view March 10 & 11

1. The Effects of an Aerobic Exercise Intervention on Daily Activity Patterns

Presenter: James Bouma, Kinesiology and Health Studies
Faculty Supporters: Dr. Robert Ross; Ashlee McGuire, Kinesiology and Health Studies

The purpose of this study was to examine the effects of participation in an aerobic exercise intervention on daily activity occurring outside of the structured exercise sessions. Participants were randomized into one of the following 4 conditions: 1) No-exercise, 2) Low volume, low intensity exercise (LVLI), 3) High volume, low intensity exercise (HVLI), 4) Low volume, high intensity (LVHI). Physical activity was measured over 7 days with an accelerometer at baseline and during week 8 of the intervention. Activity was defined as: sedentary behaviour (SED; < 100 counts/minute), light physical activity (LPA; 100 to 1951 counts/minute), moderate-to-vigorous physical activity (MVPA; ≥1952 counts/minute), and total physical activity (TPA; LPA + MVPA). Activity was quantified as average total minutes per day of each SED, LPA, MVPA, and TPA. A one-way ANOVA was used to determine if time spent in SED, LPA, MVPA, and TPA changed from baseline to week 8. Seventy-one participants (No-exercise; n=12, LVLI n=17, HVLI n=24, LVHI; n=18,) with a mean age of 54 y and waist circumference of 110 cm completed 8 weeks of the intervention. There were no significant differences in SED, LPA, MVPA, or TPA between groups at baseline. There was no significant change in SED, LPA, MVPA, or TPA at week 8 compared to baseline ($p>0.05$). Similarly, there were no significant differences in activity variables between exercise conditions. Our observations suggest that daily activity patterns do not change with the implementation of an exercise intervention in men and women.

2. Context Sensitive Acoustic Near-Neutralization in Tongue Twisters

Presenter: Anthony Brohan, Linguistics
Faculty Supporter: Dr. Anastasia Riehl, Strathy Language Unit, German

Tongue twisters present an interesting problem with respect to their implication to the interactions between phonology and phonetics. Only recently, however, have the articulations produced in tongue twisters been analyzed phonetically. The research presented is a preliminary study into the so-called /s/ $\rightarrow$ /ʃ/ neutralization occurring in English tongue twisters. Traditionally, it was believed that tongue slips in tongue twisters resulted in complete phoneme replacement, neutralizing the contrast. (Pronouncing "seashell" as "sheashell"). More recent studies suggest a differing phonetic account, in which the resulting sound is nearly-neutralized. This study examined the segments /s/ and /ʃ/ near-neutralizing in differing contexts. Acoustic data was collected from one speaker eliciting eight artificial tongue twisters repeatedly in various contexts. The central band of frequency of the sounds were analyzed using Praat. A near-neutralization effect was found, that the "neutralized" segment was significantly between a /s/ and a /sh/. This effect was observed in both a forwards and backwards direction ("sheashell" & "seasell") were both present in the data, with a noticeably stronger right-to-left effect; in accordance with cross-linguistic studies of /s/ - /sh/ neutralization. A recurrent network articulatory model is presented in the discussion, which can account for the asymmetry and context sensitivity of results. Findings move us towards a greater understanding of the greater problem of sibilant harmony across languages.

3. Intervening with Agriculture: A Case Study of Guerrilla Gardening in Kingston, Ontario

Presenter: Annie Crane, Environmental Studies
Faculty Supporters: Dr. Leela Viswanathan, Urban and Regional Planning,Geography
Graham Whitelaw, Environmental Studies, Urban and Regional Planning

The purpose of this study was to analyze guerrilla gardening's relationship to urban space and contemporary notions of sustainability. To achieve this two case studies of urban agriculture, one of guerrilla gardening and one of community gardening were developed. Through this comparison, guerrilla gardening was framed as a method of spatial intervention, drawing in notions of spatial justice and the right to the city as initially theorized by Henri Lefebvre. The guerrilla gardening case study focuses on Dig Kingston, a project started by the researcher in June of 2010, and the community gardening case study will use the Oak Street Garden, the longest standing community garden in Kingston. The community gardening case study used content analysis and semi-structured long format interviews with relevant actors. The guerrilla gardening case study consisted primarily of action based research as well as content analysis and semi-structured long format interviews. By contributing to the small, but growing, number of accounts and research on guerrilla gardening this study can be used as a starting point to look into other forms of spatial intervention and how they relate to urban space and social relations. Furthermore, through the discussion of guerrilla gardening in an academic manner more legitimacy and weight will be given to it as a method of urban agriculture and interventionist tactic. On a wider scale, perhaps it could even contribute to answering the question of how we (as a society) can transform our cities and re-engage in urban space.

4. Analyzing Endoleaks and Predicting Outcomes after Aneurysm Repair

Presenter: Jillian Gauld, Biology

Abdominal aortic aneurysms (AAAs) occur when a large blood vessel, the aorta, which supplies blood to the abdomen, pelvis, and legs, becomes exceedingly large. This can become dangerous as the aneurysm may rupture, and cause internal bleeding. Treatments for AAAs have become increasingly effective, and with proper detection, grafts may be used to surgically fix the aneurysm. Surgeons at The University of Tennessee Medical Center have seen a large variability in the survival and effectiveness of such grafts, and are working with Oak Ridge National Laboratory to help predict the success or failure of an AAA repair. The goal of this research was to analyze and integrate the results of a follow-up study on patients who have had repairs on abdominal aortic aneurysms. The analysis utilized text mining and statistical software. Radiological reports were analyzed initially using a text mining software. Documents clustered based on common words and phrases, and those relating to the occurrence of an endovascular leak (endoleak) were identified. These trends in the text were then tested for statistical significance. A contingency analysis showed a significant difference in endoleak occurrence in the populations with sigmoid diverticulosis and gallstones. Time points for the occurrence for endoleak were also plotted, and trends were identified. The results of this study provide a useful analysis of the patient dataset, and identify significant trends among patients with endoleaks after AAA repair. This study will contribute to the development of multi-modal mathematical models to predict the outcome of an abdominal aortic aneurysm repair.

5. Inhibitory Potency of Tamiflu Oseltamivir and DANA and their Modified Derivatives on Lipopolysaccharide-Induced Neu1 Sialidase Activity in Live BMA Macrophage Cells

Presenter: Merry Guo, Microbiology and Immunology
Faculty Supporter: Dr. Myron Szewczuk, Microbiology and Immunology
Co-Authors: David Ademidun, Samar Abdulkhalek, Alanna Gilmour, Preethi Jayanth, Sadagopan Magesh, Hideharu Ishida, Hiromune Ando, Makoto Kiso, Martina Wernerova, Ales Machara, Lukas Werner, Tomas Hudlicky, Myron R. Szewczuk

Toll-like receptors (TLRs) are a group of ancient receptors found on the surface of cells in our innate immune system. They are responsible for detecting conserved molecules found on pathogenic microbes, called Pathogen Associated Molecular Patterns (PAMP), such as lipopolysaccharide (LPS) molecules on the cell surfaces of Gram-negative bacteria. The activation of TLRs leads to immune responses against the pathogen infection. Although the cell signalling follow the activation of TLRs is well characterized, the initial mechanisms for TLR activation upon detecting PAMPs are not well understood. For the TLR-2,-3 and-4 receptors, we reported that an enzyme called Neu1 sialidase forms a complex with the TLR receptors on the cell surface of naïve and activated macrophages (Amith et al, 2009). Activation of this Neu1 is induced by the binding of TLR ligands, such as LPS, to their respective receptors; a specific sialyl □-2,3-linked β-galactosyl residue on the TLR is hydrolyzed by the activated Neu1 enzyme. Neuraminidase inhibitors such as BCX1827, DANA, zanamivir and oseltamivir carboxylate have a limited inhibition of this LPS-induced Neu1 activity in live macrophage cells. In contrast, Tamiflu (oseltamivir phosphate) completely blocked this Neu1 activity. Here, we tested the inhibitory potency of a series of DANA and modified Tamiflu derivatives against the activity of the Neu1 enzyme. The results suggest that the linear alkyl side chains of DANA derivatives may contribute to their increased inhibitory potency on LPS-induced Neu1 activity compared to the derivatives with methyl side chain branches and to the parent DANA compound.

6. Organic and Conventional Agriculture: Assessing Synergies Between Agricultural Approaches

Presenter: Susan Kim, Environmental Studies SSP Biology
Faculty Supporter: Dr. Warren Mabee, Policy Studies, Geography

Organic agriculture (OA) and conventional agriculture (CA) represent two polar approaches to farming, both of which hold their own challenges and implications with the impending global food crisis. One of Canada's major exports include crops, and yet globalization coupled with climate change present pressing agricultural issues leading us to ask how our farming methods will adapt to feed the world's burgeoning population. An approach to finding a solution can come from setting aside the principles and biases defining organic and conventional farming to find a combinatory approach to farming, assuming that they are not so dichotomous they can be combined. A survey of three major Canadian crops (wheat, corn, canola) and agricultural variables relevant to food production and climate change (crop yield, emissions, energy usage, and application of fertilizer) in OA and GA will lay out a spectrum upon which an optimized combined approach to farming can be sought. Ultimately, this project aims to reconcile OA and GA farming practices in the best interests of human well-being and the environment when considering the predicted global food crisis from a Canadian perspective.

7. Frontal Plane Knee Loading during Bodyweight Squat Performance: Effects of Stance Width and Foot Rotation

Presenter: David Kingston, Kinesiology and Health Studies
Faculty Supporter: Dr. Patrick Costigan, Kinesiology and Health Studies
Co-Authors: Sivan Almosnino, Shuozhi Yang, Ryan B. Graham, Joan M. Stevenson, Patrick A. Costigan

The bodyweight squat is routinely used for conditioning of the knee musculature. In the performance of this exercise, modifications in the initial standing position may result in altered frontal plane kneel loading, and hence may potentially be used for targeted exercise prescription. The purpose of this study is to quantify the frontal plane mechanical loading on the knee joint whilst performing the bodyweight squat exercise, and to examine the effects of varying stance width and foot rotation angle. Twenty-four participants (14 males) performed 4 randomized sets of 8 repetitions of the body weight resistant squat exercise in the following conditions: 1) Shoulder width (SW) stance with parallel feet; 2) SW stance with feet externally rotated 30°; 3) 140% SW stance with parallel feet, and; 4) 140% SW stance with the feet externally rotated by 30°. The adduction/abduction knee joint moment experienced across conditions was calculated using inverse dynamics procedures. Moment waveforms were subjected to Principal Component (PC) analysis, with 3 PC's retained based on a 90% trace criteria. Following, a 1-way repeated measures ANOVA and pair wise comparisons were used to discern differences between conditions. Omnibus test results indicate significant differences across conditions for PC1 and PC2 ($p<0.01$), Post hoc comparisons and waveform interpretation of PC1 extreme scores showed that the magnitude of the adduction moment was higher throughout the movement in the foot rotated conditions vs. the parallel feet conditions in both stance widths (mean Z scores .69 & .65 vs. -.88 & -.45, $p<0.01$, respectively). For PC2, significant differences were found between the 2 parallel feet conditions and the 2 foot rotated conditions, as well as between the foot conditions in the wide stance squats. PC2 differences were interpreted as phase shift operators. We found that modification of foot rotation slightly alters the magnitude and timing of knee adduction moment component during performance of the body weight squat. The observed magnitude differences are presumably a consequence of alteration in the location of the point of application of the ground reaction force during the initial standing posture. The findings may assist clinicians in exercise prescription decision making.

8. Examining the Effects of Peptide-Gold Nanoparticle Hybrids on the Activation of Myeloid Dendritic Cells

Presenter: Annie Liu, Life Sciences
Faculty Supporter: Dr. Mingyao Liu (University Health Network and Latner Thoracic Surgery Research Laboratories)

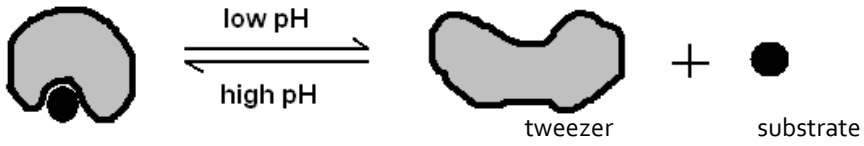
Dendritic cells (DCs) are professional antigen-presenting cells that play an important role in innate and adaptive immunity. They have become a major target for immune modulation based therapeutic strategies. Gold nanoparticles (GNPs) are biocompatible materials. The surface of GNPs can be easily modified with peptides via thiol-gold linkage to alter their surface chemistry and to modulate their cellular uptake. The purpose of this present study was to investigate the ability of peptide-GNP hybrids to modulate the DC immune response in vitro. To assess the activation effects of peptide-GNP hybrids, DCs were differentiated from bone marrow (BM) cells of black B57BL/6 mice by culture with granulocyte macrophage colony stimulating factor (GM-CSF). At day 9 of culture, BM-derived DCs (BMDCs) were exposed to GNP hybrids with a diameter of approximately 10 nm. The purity of the resulting DCs was determined by the CD11c positive cell population measured by Flow Cytometry. We found that the peptide-GNP hybrids were internalized by immature BMDC via bright field microscope imaging. Furthermore, the addition of GNPs to immature BMDCs was found to influence both phenotype and function of immature BMDCs. Stimulation by peptide-GNP hybrids on the immature BMDCs led to an

enhanced expression of co-stimulatory molecules on the cell surface, including CD40, CD80 and CD86, and a secretion of cytokines in the culture medium. This observation suggests that peptide-GNP stimulation can lead to the activation of BMDCs, and implies a potential application for strengthening vaccine delivery devices or cancer immune therapy.

9. pH Triggered Molecular Tweezers for Drug Delivery Applications

Presenter: Caitlin Miron, Chemistry
Faculty supporter: Dr. Anne Petitjean, Chemistry

Molecular tweezers are simple synthetic receptors that are generally composed of two binding domains connected by a spacer group. The non-covalent interactions that occur between the tweezer and its substrate are usually reversible, which facilitates the release of the bound substrate at a target site when triggered by a stimulus such as light, temperature, pH,[1] or change in chemical potential. In the field of cancer research, one strategy for targeting drug delivery relies on the pH drop in cancerous tissues compared to healthy tissues. We recently showed, for the first time, that it is possible to use pH to tune the binding affinity of molecular tweezers for substrates such as the cancer drug Mitoxantrone™. The molecular tweezer switches conformation from a closed (binding) state to an open (release) state upon acidification. As a result, the targeted delivery of Mitoxantrone™ is achieved. This proof of concept shows that molecular tweezers are promising tools for selective drug delivery.



10. Here Comes Spiderman, the Arachnophobian: Halloween and Constructions of Gender

Presenter: Angela Nemec, Sociology
Faculty Presenter: Dr. Annette Burfoot, Sociology

Holidays are celebrations, symbolism, and cultural traditions combined. Halloween allows for individuals, for one night a year, to transform themselves and enter a fantasy world (Kugelmass, 1994). However, upon further critical examination, this rhetoric of Halloween as a harmless, imaginative, and liberating experience undermines the critical reflection of the negative impact of many of the Halloween traditions. The Halloween ritual perpetuates social constructions of gender, which reflects society's gender inequality and heteronormativity. During Halloween celebration, exaggerated gender stereotyping is acceptable and is thus reinforcing these norms without critical examination. Themes, paraphernalia, rituals, and costumes, under labels such as 'Halloween', 'tradition', or 'holiday' are symbolic and hold much power. This research seeks to deconstruct these meanings in order to argue the effects they have on the reproduction of gender norms and stereotypes as well as heteronormativity. Halloween has a lot to do with visual representation. Often, this visual representation during Halloween celebration "…reproduces and reiterates more conventional messages about gender (Nelson, 2000). In the process of 'celebration', these messages about gender are given the opportunity to manifest themselves. Rarely do those partaking in these rituals critically examine the broader implications to gender stereotyping and inequality as well as heteronormativity and homophobia. Areas of study that will be discussed in the process of arguing these statements include gender (norms, roles, stereotypes, deviance, and sexuality), media, culture, consumerism, fashion, celebrations, and rituals.

11. Solar Juice - Creating Green and Cost-Effective Dye Sensitized Solar Cells

Presenter: Susie Pan, Commerce
Faculty Supporter: Dr. Joshua Pearce, Environmental Studies

The goal of this project was to address the current need for alternative energy sources by investigating in dye-sensitized solar cells (DSSCs). This experiment explored ways to prolong the operational lifespan of DSSCs and increase their current production. Firstly, to prolong the effectiveness of the dye, benzoic acid was added to the solar cells as a preservative. Secondly, to prevent the evaporation of the liquid electrolyte, several sealing agents were used to seal the edges of the cells. Thirdly, to increase current production, different types of fruit dyes were mixed based on spectroscopy analysis, and produced solar cells with higher current readings than the control cells. A wider range of wavelength was absorbed by the combined dye. Citric acid in the form of lemon juice was also added to the dyes in order to increase current production as well as increase lifespan. The optimal pHs for current production of several dye molecules were determined. Factoring in carbon footprint and cost analysis, the solar cells are fabricated in the most efficient and environmentally-friendly manner. Through this experiment, it has been revealed that DSSCs may eventually become a viable future technology with additional research and experimentation.

12. Deconstructing Dad: Satire and Hegemonic Masculinity in Mainstream Television

Presenter: Laura G. Ritenburg, Gender Studies

What's sarcastic, droll, brightly coloured, watched by millions and enforces a hegemonic masculine identity? No, not a sports centre update. *Family Guy and American Dad!*, along with other mainstream popular television shows, feeds into extreme notions of masculinity by depicting humorous macho images that emulate physical strength, aggressiveness, willingness to use violence, and the subordination of women to achieve it. Television as a medium plays an influential role when depicting the stereotypes that are present within social systems. In this paper I discuss the relationships between humour and the construction of a normative hegemonic masculine identity, and explore two examples from *Family Guy* and *American Dad!.* I argue that through a steady stream of humorous images, a standard is created that constructs a normative hegemonic masculinity that in turn has created a measuring stick of dominant and subordinate masculine identities. The television shows *Family Guy* and *American Dad!* use the power of satire to influence the responses of viewers.

13. A Novel Method of Culturing Murine Induced Pluripotent Stem Cells (iPSCs)

Presenter: Kirsten Sjonnesen, Life Sciences

Similar to embryonic stem cells (ESCs), iPSCs have the ability to differentiate into all three cell lineages, while not being subjected to the ethical complications attributed to ESCs. Our project goal was to develop a novel method of culturing murine iPSCs, reprogrammed from mouse embryonic fibroblasts, in large-scale quantities while maintaining their pluripotent characteristics and genomic integrity over a long term period. Stirred Suspension Bioreactors (SSBs) propose several benefits over static culture systems and facilitate the large-scale, economical expansion required for clinical studies. In our work with the SSB system, various techniques were used to promote and analyze the continued pluripotency of the murine iPSCs. Our results showed that iPSCs maintained their pluripotent state in SSBs and retained their ability to differentiate into different cell lineages after long term culture. miPSC were induced to differentiate into heart, bone and cartilage tissues at the end of maintenance period. The cumulative cell-fold expansion of iPSCs in suspension culture was 8.8×10^{10} cells, with 75% mean pluripotency at each passage. The cells expressed the major pluripotency markers as detected by RT-PCR. This study confirms the utility of the SSB system as a tool to cultivate large quantities of functional mouse iPSCs. SSBs have

tremendous potential in future clinical applications and work has now begun to applying this system towards culturing human iPSCs. One potential application is the derivation of disease and patient derived iPSCs, which can recapitulate the disease phenotype for use as an in vitro model.

The following posters are a result of research done by the students in Dr. Cynthia Levine-Rasky's Sociology 233: 'Race' and Racialization course. These ten posters were chosen by the entire class to be exhibited at I@Q.

14. Muslim Women in Canada: Victims of Islamophobia?
Presenters: Meagan Berlin and Delaram Baghi

15. Systemic Racism at Queen's University
Presenters: Tamar Bresler and Olivia Hay

16. Ethnic Enclaves
Presenter: Brandon Chung

17. No Terrorists Allowed
Presenters: Holly Curtis and Hannah Thommy

18. The Sixties Scoop: A Cultural Genocide that Continues Today
Presenters: Carmen Hergott and Natasha Stirrett

19. The Story Behind the Devadasi, India's Prostitute of God
Presenters: Myriame Lepine-Lyons and Nathan Vatcher

20. Racial Profiling
Presenters: Alisha Puigmarti and James McDonald

21. Online Hate: Discrimination at the Click of a Button
Presenters: Carly Scholz and Shannon Jessop

22. Canadian Residential Schools: A Legacy of Racism and Resistance
Presenter: Amy Stoyan

23. Eugenics in the Canadian Context: The 1928 Sterilization Act
Presenters: Nicole Walter and Brian Johnson

ALPHABETICAL LIST OF PRESENTERS

Presenter	Session #
Baghi, Delaram	XI
Beamish, Alison	IX
Belej-Corrigan, Colie	Opening Panel
Berlin, Meagan	XI
Bi, Yena	VIII
Bouchard, Aimee	Opening Panel
Bouma, James	XI
Bresler, Tamar	XI
Brohan, Anthony	IV + XI
Buitenhuis, Amy	I
Chen, Victoria	IV
Chung, Brandon	XI
Colwell, Renata	III
Craig, Romany	III
Crane, Annie	XI
Crowson, Julie	X
Curtis, Holly	XI
Daly, Tabitha	III
Dault, Laurel	VIII
Dey, Avanti	IV
Flood, Diana	IX
Foo, Brian	II
Freeman, Kyra	VI
Gauld, Jillian	XI
Green, Alex	X
Griffith, Lindsey	X
Guo, Merry	XI
Haberl , Monica	VIII
Harvey, Craig	II
Hay, Olivia	XI
Hayek, Brigid	VII
Hergott, Carmen	XI
Holdsworth, Peter	III
Hughes, Kevin	VI
Hunniford, Michelle	VII
Jee, Catherine	I
Jenkins, Samantha	V
Jessop, Shannon	XI
Jiang, Wei Ning (Will)	X
Johnson, Brian	XI
Killoran, Raissa	I
Kim, Susan	XI
Kingston, David	XI

Kong , David	II
Krentz,Andrew	IX
Kurzawa, Zuza	VIII
Laing, Christopher	IX
Lepine-Lyons, Myriame	XI
Leung, Jaime	IV
Lipinski, Matthew	VII
Liu, Annie	XI
Low, Eric	VI
Magowan, Ryan	IX
MacMillan, Norah	X
Martin, Kristen	Opening Panel
McCulloch, Gretchen	III
McCutcheon, Sarah	II
McDonald, James	XI
McParland, Daniel	IX
Millington, Liane	IX
Miron, Caitlin	XI
Moon, Nathalie	II
Nacimben, Marissa	Opening Panel
Nayyar, Dhruv	VII
Nemec, Angela	XI
Pan, Susie	XI
Pagotto, Sabina	I
Payette, Brett	Opening Panel
Perlman, Evan	III
Poon, Tina	IV
Prins, Andrea	IV
Puigmarti, Alisha	XI
Ritenburg, Laura	XI
Rochford, Mark	VII
Sampson, Lauren	V
Scholz, Carly	XI
Sebben, Cody	V
Sela, Lee	X
Sjonnesen, Kirsten	XI
Smith, Leora	Opening Panel
Stirrett, Natasha	XI
Stoyan, Amy	XI
Thorgrimson, Joelle	IX
Thommy, Hannah	XI
Thompson, Michelle	Opening Panel
Vatcher, Nathan	XI
Vukatana, Ena	I
Walter, Nicole	XI
Wyman-McCarthy, Tim	VII
Yagi, Michelle	Opening Panel
Zheng, Zach	IX

ACKNOWLEDGEMENTS

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