



Inquiry@Queen's

3rd Annual Undergraduate Research Conference

Program

March 5 & 6, 2009
Queen's Learning Commons
Stauffer Library

iatq.ca

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March 2009

Welcome to the 3rd Annual Inquiry@Queen's Undergraduate Research Conference where we will celebrate the discoveries of a new generation of scholars. 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!

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 5, 2009

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

- 9:00 Coffee
- 9:30 Opening Remarks
Greetings from the University:
Dr. Patrick Deane, Vice-Principal (Academic)
Dr. Joy Mighty, Director, Centre for Teaching and Learning
- 9:45 Keynote Address:
Inquiry in the modern university: a subversive view? Dr. Kim Nossal,
Department of Political Studies
- 10:15 Session I: Transform ∞ Translate
- 10:15 Session II: Social ∞ Identity (Room 121, Stauffer Library)
- 11:40 Session III: Time ∞ Space (Room 121, Stauffer Library)
- 12:40 Lunch Break
- 1:00 Special Event – “Share This Soapbox”
- 1:30 Session IV: Interface ∞ Interact
- 1:30 Session V: Community ∞ Humanity (Room 121, Stauffer Library)
- 3:30 Break
- 3:45 Session VI: Relate ∞ Connect
- 5:00 Inquiry@Queen's Reception, Fireplace Reading Room, 2nd Floor,
Stauffer Library
- Remarks:
Paul Wiens, University Librarian
- Guest Speaker:
Jennifer Hosek, Assistant Professor, Department of German
Language & Literature, *Finding 'Home': A Politics of Projection*
- Door Prizes!

Friday, March 6, 2009

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

9:00	Coffee
9:15	Opening Remarks
9:30	Session VII: Natural ∞ Capital
9:30	Session VIII: Innovation ∞ Ideas (Room 121, Stauffer Library)
11:30	Session XI: Lunch with the Poster Presenters (Room 121, Stauffer Library)
1:00	Session IX: Represent ∞ Imagine
2:30	Session X: Action ∞ Reaction
3:50	Closing Remarks
	Door Prizes!

ORAL PRESENTATIONS

Session I: Transform ∞ Translate

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

Thursday, March 5, 10:15-12:15

Moderator: Dr. Jenn Stephenson, Drama

The New Student Activism

Presenter: Talia Radcliffe, Political Studies

It is seemingly accepted that students have become passive members of civil society. Today's youth are comparatively disillusioned with their baby boomer parents' activist idealism, and have, therefore, sought a more personalized way to engage with the world: development projects. Students are in the unique circumstance of being bound to no dependents or income, which is quite an apt circumstance for activism of any type. Furthermore, students typically possess a desire to, at least, "find themselves" and at best, "change the world," both of which are states of mind that make student development work specifically opportune. Since project-based international development has taken a turn for the popular, it has become trendy for students to build schools, teach about HIV/AIDS, and install plumbing systems in the Global South. However, few of these initiatives appear to be informed by individual cultures and circumstances of living. Considering students are in an optimal life circumstance, it must be questioned what the best way might be to direct this unique position in order to instigate meaningful social change. Considering that students are at the apex of their educations, it is more appropriate and beneficial to have students live, experience and participate in communities in the Global South in order to truly understand the problems at hand and to recognize the priorities of varying communities and subsequently before advising policy-makers. Positive change must be made at a halfway point between informed governmental policy and grassroots organizational empowerment, but change cannot and will not happen until information is generated from on-the-ground experience, and until our best resources are encouraged to learn before they take action.

Access to Lighting in Northern Ghana: Is Solar Power the Answer?

Presenters: Amy Buitenhuis, Mathematics and Engineering; Lindsay Wiginton, Civil Engineering

Solar lighting technology is seen as an exciting new opportunity for developing communities to have off-grid access to lighting. It is promoted as a viable form of appropriate technology, and there are many projects which are attempting to implement this technology in rural communities across the world, including Ghana. Compared to its counterparts, Ghana is a rapidly developing African country; however, there remains much polarization between the northern and southern regions. The northern region is generally less developed, and one challenge faced is the lack of access to electricity and lighting. A project has been initiated by an international institution to develop the market chains of retail and distribution for individual solar-powered lights in this region. The proposed benefits of the project are better studying conditions for students, more opportunity for conducting economic activity after dark, mitigation of health risks and improved community gatherings. However, solar panels are expensive and not commonly used in these types of communities; it is important to carefully examine the feasibility of the project for the average family in northern Ghana. The authors will present socio-economic data gathered through 59 household interviews in three communities in northern Ghana. This data includes household expenditure on current lighting sources such as kerosene, flashlight batteries, and electricity; as well as current uses of lighting. Based on the income of families in these communities, as well as their specific lighting needs, the authors hypothesize that the project proposed is not viable for the members of these rural communities.

Moisture Absorption, Impact Strength of Wheat Straw HDPE Composites

Presenter: Yiyi Shangguan, Chemical Engineering

Faculty Supporter: Dr. Caroline Baillie, Chemical Engineering

The Waste-for-Life project researches and develops composites of waste plastic bags and cardboard – reinforced by natural fibres – to build domestic goods such as furniture and roof tiles. Its purpose is to reduce environmental harm caused by plastic waste and provide self-sustainability for people in developing countries who collect these wastes for a living. One of the composites under study consists of finely milled wheat straw pressed together with high density polyethylene (HDPE) in different weight ratios. Little is known about this composite material, thus tests are performed to determine its physical properties – in particular its moisture absorption, and impact strength. A hotpress and extruder were used to manufacture the composite into tiles. These tiles are then cut and subjected to water, and impact to determine its limits. The procedure and standards of these tests are researched and carried out. The results are interpreted and conclusions are made as to whether or not this material is suitable for constructing domestic goods.

No Access to Services: The Struggle of Injection Drug Using Women in Abusive Relationships

Presenter: Emily Macgillivray, Women's Studies

Faculty Supporter: Dr. Jean Pfleiderer, Women's Studies

Women who experience violence and are at risk for HIV/AIDS are a multiply marginalized population which the majority of service providers ignore or feel they do not have the resources to deal with. Furthermore, while the Canadian government issues reports on violence against women, it does not provide an analysis of the intersection between violence HIV/AIDS. Women who are at risk for HIV due to injection drug use are particularly vulnerable when in a violent relationship; most women's shelters have zero tolerance policies for substance use leaving these women isolated. By examining how substance use increases HIV risk for women who experience violence, the high risk behaviors associated with violence, and the high risk behaviors associated with substance use, multiply marginalized women's needs become clearer. Service providers for multiply marginalized women must always consider the ramifications of their policies, as well as the ideologies that their policies are based on so that they can effectively help their target population. To address the needs of multiply marginalized women, drastic changes need to be made to the current shelter system: shelters need to examine their ideological foundation and analyze what stigmas their current policies support. Coordinated efforts are needed between multiple service providers to address the challenges that these often forgotten women face.

Meeting the Needs of Women: Current Treatment Options Available for Women Who Have a History of Physical, Sexual or Emotional Trauma and are Current Substance Users

Presenter: Jordanne Dalglish, Health Studies

Faculty Supporter: Dr. Elaine Power, Kinesiology and Health Studies

There is growing research which describes a strong relationship between early trauma and abuse histories with adult substance abuse. This relationship has often been explained as a coping tool by women who learn to self-medicate the distress created by abuse. (Eliason, 2006) Although this link has been researched and treatment options explored, counselling services, substance abuse treatment programs and health service programs have only recently come together to address the intersections of past trauma, substance abuse and vulnerability in terms of affecting negative health and treatment outcomes. (Poole & Greaves, 2007) Women with both trauma and substance use issues have had to

catalogue their needs and seek separate services, which has often led to incompatible treatment programs. Women who seek out treatment to address issues of sexual trauma may jeopardize their sobriety when strong feelings surface in the counselling process, resulting in a relapse. (Poole & Greaves, 2007) Combining treatments for trauma and substance use may be more effective for clients, and may also be more cost effective in using resources. There is a need for more research to gather additional data and determine the significance and result of treatment outcomes.

Session II: Social ∞ Identity

Stauffer Library 121, Queen's Learning Commons, Stauffer Library

Thursday, March 5, 10:15-11:35

Moderator: Dr. Jill Scott, German

Defining, Constructing, and Communicating Heritage at a "Living History" Museum: The Case of the Ukrainian Cultural Heritage Village

Presenter: Thomas Beck, Geography

The Ukrainian Cultural Heritage Village, an open-air, living history museum, provides a case study of how heritage is defined and presented. Drawing on David Lowenthal's conception as heritage as a social construction and Diane Barthel's idea of "symbolic bankers", this paper explores how the Village has defined heritage and who has been involved in its definition. This paper will argue that the Village uses heritage to promote the cultural identity of the Ukrainian community while simultaneously strengthening Albertan pride and 'nationalism' through recognizing diversity and multiculturalism, but excludes the heritages of First Nations peoples and the other settler nations. The paper then evaluates the effectiveness of the Village's attempts to portray history and communicate heritage considering the first-person method of interpretation used and the involvement of the Alberta Government. The paper finds that the limitations of first-person interpretation and the economic goals of the Alberta Government have led the Village to a position where it risks the trivialization of Ukrainian cultural meanings and the simplification and sanitization of Alberta's historical narrative.

Algonquin Provincial Park as Policed Space

Presenter: Yolanda Weima, Geography

Faculty Supporter: Dr. Anne Marie Claire Godlewska, Geography

This paper explores the creation of Algonquin Park, and its social and economic exclusion of local people, including the people after which the park was named, in favour of industrial resource exploitation. The very foundation of the park in 1893 was a form of exclusion, though Aboriginal people were so socially marginalized that their existence was only subsequently recognized through the casting of their everyday behaviours as deviant. Non-Aboriginal trappers were also confronted with the prohibition of their primary economic activity. Surveillance and law enforcement became important as hunting and simply entering the space without permission were criminalized. Official publications and brochures highlight the public and recreational aspects of the park, but industrial resource extraction, particularly clear cut logging by private lease-holding companies, was deemed a legitimate activity. This reflects the related capitalist and colonial values of the provincial government and suggests that the creation of Algonquin Provincial Park was hegemonic and economic. The record of legislation, policy construction and enforcement in the park provide an excellent testimony of this reality.

Allegiance to America: The Identity of Individuals in *The Union*

Presenter: Sarah Doerksen, History

Faculty Supporter: Dr. Jeff Brison, History

The individual has been an enduring figure in American history, claiming prominence even in the turbulent decades of the nineteenth century characterized by conflict between industrialists and collective unions. Andrew Carnegie captured the American press' headlines during this period. However, his appearance in American publications, such as the *New York Times* and *Harper's Weekly*, frequently coincided with news coverage of his adversary, the Knights of Labor (KOL). This conceptual binary provides an opportunity to explore the place of the individual and conversely the group in American history. Neither Carnegie nor the KOL escaped censure by the mainstream media or by extension, the American public. But despite Carnegie's immigrant background and endorsement of his Scottish heritage, the media portrayed the industrialist as distinctly American while they depicted the KOL as distinct from Americans. Historiography attributes the dichotomy between representations of the elite and the working class to a disparity of capital. However, claims to patriotism had to be accepted by the mass public. Focus should be redirected to the publicized accounts of Carnegie's public commitments which coincided with American conceptions of civic involvement and reinforced this individual's place in American society. In contrast, the media's portrayal of the KOL's activities, which reflected their members' interests, emphasized the union's collective unity and insularity. In exploring definitions of patriotism and American identity, the contrasting representations of Carnegie and the Knights of Labor speak to the importance ascribed to individualism in America and the expectation that Americans pledge allegiance to a single, national Union.

Mainstream Superhero Comics and Gendered Representations of Social Control

Presenter: Hope Hutchins, Sociology

Faculty Supporter: Dr. Vincent Sacco, Sociology

In the context of increasing familiarity with mainstream superhero comics and their characters, a wide range of readers are being exposed to the values regarding gender and social control being communicated in this genre. Therefore, it is important to assess whether social control is signified differently for males and females in superhero comics. This presentation will begin with a discussion of why it is important to study comics and graphic novels. I will then outline the concept of social control and criminological theories centered on this idea before demonstrating why superheroes may be understood as agents of social control. This will bring me to a discussion of preliminary findings of a qualitative content analysis of issues of Batman, Captain America, Wonder Woman, Ms Marvel, Justice League of America, and New Avengers comics released from May to October 2007. In examining the leadership positions, the formal and informal methods employed, those over whom social control is exercised, and relative success of each superhero in these issues, I am seeking to assess whether social control is portrayed as being exercised by male and female superheroes in different ways and to identify how this happens. The results of this content analysis will be compared with previous studies of women police officers to assess whether representations of female agents of social control in superhero comics are consistent with the experiences of real-life criminal justice practitioners. Finally, the reasons for and implications of the nature of such media constructions will be briefly explored to encourage other students to study comics and graphic novels.

Session III: Time ∞ Space

Stauffer Library 121, Queen's Learning Commons, Stauffer Library

Thursday, March 5, 11:40-12:40

Moderator: Dr. Barrington Walker, History

Long Distance Dating Relationships: Do People in Them Really Experience Less Sexual and Relationship Satisfaction, Intimacy, Love, and Sexual Communication?

Presenter: Emma Dargie, Psychology

Faculty Supporter: Dr. Caroline Pukall, Psychology

Despite the high prevalence of long distance dating relationships (LDDRs), they have been understudied, and many facets remain unexplored. Previous studies examined variables such as idealization, communication, and relationship satisfaction, but many contradictory results exist. Furthermore, no studies thus far have examined sexuality and how it is impacted by long distance. The purpose of this study is to examine differences in various relationship and sexual characteristics between individuals in LDDRs and in geographically close relationships (GCRs). Gender differences will also be examined. Participants are invited to visit a secure website that contains online questionnaires. The main outcomes variables are intimacy, communication, sexual and relationship satisfaction, and love. Two main research questions will be investigated: (1) whether there are differences between individuals in LDDRs and GCRs on the outcome variables, and (2) if distance apart/frequency of face-to-face contact predicts sexual and relationship satisfaction, intimacy, and communication for couples in LDDRs. It is expected that individuals in LDDRs will have lower relationship adjustment and sexual satisfaction than those in GCRs. In addition, it is expected that females will score higher on measures of sexual and relationship satisfaction, love, and intimacy than males, regardless of relationship type. Furthermore, it is expected that greater distance apart/lower frequency of contact will predict negative outcomes in the aforementioned variables, and that love and attitude towards LDDRs will mediate these relationships. This study is currently ongoing, and results will be presented.

Playing With Time: An Analysis of Time and Space in Tom Stoppard's *Rosencrantz and Guildenstern Are Dead*

Presenter: Johanna Lawrie, Drama

Faculty Supporter: Dr. Jenn Stephenson, Drama

In this paper I will examine the multiple layers of time within Tom Stoppard's play, *Rosencrantz and Guildenstern Are Dead*. Typically, a script plays with two definitions of the term: stage time being that of the audience and the "real world," and dramatic time, the passing of time within the world of the play and the characters' lives. *Rosencrantz and Guildenstern Are Dead* is unique in its multitude of times, each occupying its own space within the story. *Hamlet* resides in a time that extends beyond that of *Rosencrantz and Guildenstern Are Dead*, while presenting the same story through different characters. When are these stories presented harmoniously, and when can gaps be found between the two plays in terms of time? In contrast, the play-within-a-play presented in *Rosencrantz and Guildenstern Are Dead*, titled "The Murder of Gonzago," represents the story even prior to the opening scene of *Hamlet* and has an omniscient quality, presenting elements of both *Hamlet* and *Rosencrantz and Guildenstern Are Dead*. Though this play-within-a-play represents the longest view of the overlapping stories, it is presented in the shortest amount of time. "The Murder of Gonzago" plays with the limitations of time and space and the acknowledgment of their presentation in theatrical terms. Throughout the paper I will determine the overlapping nature of times within the plays, how they are structured around one another, and what this symbolises for both the spaces of each play and the characters within.

The Activation of Scene Gist: Global Versus Local Features

Presenter: Laura Shields, Psychology

Faculty Supporter: Dr. Monica Castelhana, Psychology

The present study investigates how human observers understand real-world scenes. Past studies have shown that individuals infer the meaning or gist of a real-world scene within a single glance. The current study examined how much visual information is needed in order to elicit an understanding of a visual scene. Sixty participants were shown a brief presentation of a scene and the amount of scene information shown was manipulated across six experimental conditions, varying from only details at the centre (local features) to the full scene (global features). Local features are objects present in a scene, or can also be visual features such as textures, colours and other surface properties important for understanding a visual scene. Global features encompass the actual space of the scene, including the geometry, spatial layout, and scene structure. Based on past research, we anticipate scene understanding will occur where global features are available, but not in conditions where only local features are available. However, preliminary results revealed that participants understood the gist of the scene even when minimal features were available to them. This study aims to further current research on scene understanding and the visual features required to comprehend complex visual information in our environment.

Session IV: Interface ∞ Interact

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

Thursday, March 5, 1:30-3:30

Moderator: Dr. Robert Burge, Registrar, Education

Healing the Civic Body: Darren O'Donnell's Social Acupuncture

Presenter: Adam Wray, Drama

Faculty Supporter: Dr. Jenn Stephenson, Drama

Darren O'Donnell (b. 1965) is a writer, director, actor, playwright, and designer, and the artistic director of the highly decorated Mammalian Diving Reflex. My study is focused on his work in social acupuncture, outlined in his *Social Acupuncture: A guide to suicide, performance, and utopia* (2006). Social acupuncture is a style of theatre/performance art that "blurs the line between art and life," impelling people to come together in unusual ways and tap into the power of the social sphere. With social acupuncture, O'Donnell and Mammalian Diving Reflex are striving to create an aesthetic of civic engagement: an avenue through which social edifices like public space, schools, and the media can be used as the armature for the mounting of work that "takes modest glances at simple power dynamics and, for a moment, provides a glimpse of other possibilities." Mammalian Diving Reflex began their exploration of the form in the summer of 2003 with *The Talking Creature*, and since then have devised and performed almost two-dozen similar "needles" worldwide. Social acupuncture warrants examination not only from a socio-political perspective, but through a theatrical lens, as well. It probes the relationship between audience and performer, raises questions about theatre's ability to keep up with other media in the digital age, and offers tremendous insight into the potential for positive, fruitful intersections between art and civil society. My project will include theoretical examination of O'Donnell's work, as well as practical exploration of the form's potential.

Are You the Type of Person Who Likes Other People? Extended Uses of the Reciprocal Particle *-an* in Kinyarwanda

Presenter: Gretchen McCulloch, Linguistics

Faculty Supporter: Dr. Charlotte Reinholtz, Linguistics

In linguistics, making a verb reciprocal means that one person does something to another person and that the other person does the same thing to the first person. Thus "John and Mary like each other" implies that "John likes Mary" and "Mary likes John." In most languages, one can only make a verb reciprocal when its subject is plural, so that "John and Mary like each other" is fine, but *"John likes each other" does not make sense. In Kinyarwanda, a Bantu language spoken in Rwanda, the reciprocal is indicated by the suffix *-an* on the verb, for example, *Habimana na Mariya barakundana* "Habimana and Maria like each other." However, the equivalent sentence with a singular subject, *Habimana arakundana*, does not have the nonsense interpretation *"Habimana likes each other" but rather the more intelligible "Habimana is the type of person who likes other people." Based on this rather unusual finding from field work with a native speaker of Kinyarwanda, this presentation explores the suffix *-an* in terms of the types of sentences in which it can and cannot appear in an attempt to generalize how it is used, the range of its meaning, and its possible relation with the preposition *na* "with."

Home and the World: A Look at the Gendering of Indian Nationalist Politics Through a Literary Lens

Presenter: Jenisse Galloway, History

Faculty Supporter: Dr. Ishita Pande, History

Works of literature are not often given much credence in terms of their value or use in the writing and interpreting of history. However, it is important to realize the potential for novels to illuminate and give new meaning to particular historical issues and events. Rabindranath Tagore, renowned Indian author, Nobel Prize winner, and independence activist, in his novel, *The Home and the World* provides us with a good case and point. This influential work of fiction, published in 1916, offers an intriguing look at the way that the nationalist identity of India became highly gendered and sexualized as various nationalist groups attempted to confront the building conflict between tradition and modernity. My presentation will discuss the idea of the woman as the mother goddess of the nation, as well as the role of masculine insecurity in the unfolding of nationalist political action, through Tagore's fictional depiction of the Swadeshi movement in early twentieth century India. Along with this artistic depiction, I will discuss a number of important historians of Indian nationalism to expose the numerous contradictions within these nationalist programs and how those contradictions manifest themselves in increasingly gendered trends such as a greater push for masculine aggression and a redefinition of the 'ideal woman'. What *The Home and the World* exposes is that, despite the efforts of nationalists to keep the inner domain of the home unaffected by modernity, their tactic of placing women at the symbolic head of the nationalist movement had broken down the traditional boundaries of the home.

Don Quijote of La Mancha: Symbol of the Spanish Spirit

Presenter: Tara Downs, Spanish and Italian

In his masterpiece *Don Quijote of La Mancha*, Miguel de Cervantes uses protagonists Don Quijote and his squire, Sancho Panza, to discuss various important themes, including the juxtaposition of reality and illusion, and the Spanish culture itself—both of which continue to be relevant today. He attributes ideas such as illusion and idealism to Don Quijote, and reality and realism to Sancho Panza. All of these attributes can be applied to Spain, a country with a history full of contrasts. This is especially clear through the history of Spain in the twentieth century. At this time Spain lost its last colonies, had a civil war which resulted in a 36 year dictatorship, and, obtained freedom with the death of Franco in 1975.

This study examines poems by writers such as Miguel de Unamuno, Miguel Hernández, and Mario Hernández and analyses the attitudes present towards each of these historic events. In doing so, it becomes clear that the Spanish mindset shifts between moments of "quijotismo" and moments of "sanchismo." Therefore, this study aims to demonstrate that by analyzing twentieth century Spanish poetry, it is clear that Cervantes' masterpiece *Don Quijote* serves as the symbol of the Spanish spirit throughout history.

Rudolf II & Bartholomeus Spranger: Rudolf II as the Patron of Spranger's Mythologies and Allegories. Virtuosity and Maniera.

Presenter: Lehti Mairike Keelmann, Art History

Faculty Supporter: Dr. Cathleen Hoeniger, Art History

The court of Holy Roman Emperor Rudolf II in Prague was described by 17th century German art historian Joachim von Sandrart as "the Parnassus of the arts". Sandrart's Dutch counterpart Karl van Mander went even further to praise Rudolf II as "the greatest art patron in the world at the present time". Rudolf II's involvement with art was two fold. He was an avid art collector with an enormous Kunstkammer, and he also was the ideal patron of art coveted by artists. Both his collection, which included works by Dürer and Titian, and his artists at court, reflected his imperial, cosmopolitan ambitions. This presentation will examine the visual language of the mythological and allegorical paintings commissioned by Rudolf II for his newly expanded palace in Prague. In particular, there will be a focus on the iconography and style of the paintings by imperial court painter Bartholomeus Spranger, with comparisons made to related paintings by fellow court painters Hans von Aachen and Joseph Heintz. Ultimately, the competitive nature of Rudolf II's court, as well as the presence of a large art collection, encouraged Spranger as the imperial court painter to emulate, invent, and test his virtuosity in depicting subject matter. The result was seen especially in Spranger's *Metamorphoses* cycle and allegories representing Rudolf II's empire. Indeed, Rudolf II's patronage of art became a sign of imperial power rather than a comforting hobby practiced by an out of touch ruler within the realm of Eastern Europe.

The Philosophy-Literature Interface

Presenter: Brendan May, Philosophy & Linguistics

Analytic philosophy has come to dominate modern academic thought. It is a method of study that attempts to solve problems through a logical analysis of the terms in which they are expressed. In many ways, analytic philosophy strives not to discover new metaphysical or supernatural truths. Rather, it is meant to provide a deeper understanding of existing truths. This strain of philosophy, I believe, sets forth exactly those goals and methods of thinking upon which philosophy should concentrate. The investigation and clarification of the state of the world, whether through logic, metaphysics, value theory, or epistemology, is an invaluable development that is best suited to philosophical analysis. However, this restricted focus means that something must pick up where philosophy leaves off. The solutions to any potential problems or shortcomings necessarily imposed on analytic philosophy need to be found within a different realm of study. This support to philosophy can be found in the study of English, or literature. Neither realm of thought is more inherently valuable. Each is needed for different reasons, and each relies on the other. Philosophy needs literature to enter the modes of thought into which it cannot validly stray. Literature needs philosophy to provide a stable base of thought from which it can imaginatively expand. In short, no set of ideas can stand alone, and the rise of analytic philosophy has made its discipline's role extremely clear. It has also made evident the fact that philosophy's greatest ally and clearest counterpart is literature.

Session V: Community ∞ Humanity

Stauffer Library 121, Queen's Learning Commons, Stauffer Library

Thursday, March 5, 1:30-3:30

Moderator: Dr. Doug Babington, Writing Centre

The Value of Community Service-Learning as an Alternative Learning Strategy: A Reflection on Experiential Education and Self-Discovery in the Department of Volunteer Services at Kingston General Hospital

Presenter: Matthew P. Ponsford, Biology

Faculty Supporters: Dr. Martina Hardwick, History; Ms. Lori Vos, Writing Centre

Community Service-Learning (CSL) is a strategy that enables teaching and learning through valuable community service, by teaching civic responsibility and enforcing the importance of reflection. CSL allows for student participation in community service that directly relates to specific learning outcomes. This ensures a mutual benefit for both the organization receiving voluntary service and the individual participating in CSL. For the individual, benefits include developing self-awareness, critical thinking, and a commitment to volunteerism and public service. In my current CSL placement at Kingston General Hospital (KGH), a number of institutional, community and personal benefits resulted from a full academic year placement in the Department of Volunteer Services. In thinking carefully about my experience—reflecting on what I had seen, heard and experienced—it became obvious that the issues arising from the reflection process could serve as an alternative learning experience for students. Specifically, the CSL approach to learning provides a tangible learning opportunity that enables students to develop a deeper understanding of their experiences. In this presentation, I will provide an argument as to why a hands-on, practical form of learning is better than concentrating on academic in-class instruction alone. Thus I will establish reasons why CSL supplements the regular learning process and results in a well-rounded educational experience.

Give it Away Now: An Explanation of the Empirical Results of the Ultimatum and Centipede Games

Presenter: Liam Mulligan, Economics

Faculty Supporter: Father Raymond de Souza, Economics

Economics defines individual rationality as consumers making choices that maximize their utility in anticipation of the future consequences of these choices. In theory, a consumer will take his or her income and allocate it towards purchases that maximize his or her utility given his or her stable of reasonably static preferences (in the short run) and estimated changes to preferences in the long run. In order for an agent to maximize his or her utility, the agent must also maximize his or her income. However, behavioural studies on human decisions in economic games (game theory) have shown that consumers do not always maximize their income. Two games in particular (Ultimatum and Centipede) have demonstrated that seemingly rational players may not maximize income, whether for perceived fairness, justice, or punishment. Practical applications of these results are observed in labour relations when striking unionized employees earn less with a labour stoppage than they would have if they had avoided losing time at work. Specifically, a seven week strike in 2008 by CUPE Local 855 (Kawartha Lakes) is examined. It is determined that all four job types in the City of Kawartha Lakes Children's Services department lost income because of the strike. Reasoning and empirical results from both the Ultimatum and Centipede games will be used to explain the Union's decision to strike and to strike for as long as they did.

Empowering Residents and Families for Care Decisions at End of Life

Presenters: Eva L. Barnett, Susan Reese, Nursing

Faculty Supporter: Melissa Raby, Nursing

Emphasis on client-centred care is the philosophy for most health care institutions. Long-term care nursing homes have adopted this philosophy as well, with added emphasis on quality End-of-Life Care. Medical advancements have made End-of-Life care more complex and individuals and families are often asked to make crucial care decisions in the midst of crisis for their loved ones that may not be in accordance with the actual wishes of their loved ones. Fairmount Nursing Home in Glenburnie has been a leader in their expertise in client centered care. This setting provided a welcoming environment for two of the Queen's 4th year nursing students to complete a practicum in Community Health Promotion. Our goal was to increase quality of care at End-of-Life by stimulating conversations around advanced decision- making. The focus was on expanding the knowledge of residents and their families and Substitute Decision Makers and thereby prompting thoughts about discussion before acute illness or crisis. A social assessment and literature search revealed that everyone has "a story to tell" about a personal End-of-Life experience. Through the development of a toolkit, reminders in the Fairmount monthly newsletter to advise readers of resources, and a presentation of information and resources at "Family Night", we intended to encourage earlier important and focused conversations between residents, families and staff. We found that the information we presented promoted both discussion and questions regarding End-of-Life. Strategic work must continue in order to assist people of all ages and stages of life to talk about their values and wishes before a health crisis intervenes and the opportunity for thoughtful choice is lost.

Deontic Reasoning and Social-Convention Learning in Preschoolers

Presenter: Joyce Mak, Psychology

Faculty Supporter: Dr. Mark Sabbagh, Psychology

Deontic reasoning is the understanding of what may, must, or ought (not) to be done under given circumstances (Wellman & Miller, 2008). Deontic logic is often applied to social-conventional rules (such as "set the table with the fork on the left") to give those social- conventions moral force, even though most people would agree that arbitrary social conventions are morally neutral. A critical question concerns whether the connection between social-conventions and deontic logic is present in young children, or learned more slowly over time. To examine this, we provided forty-eight (24 male; 24 female) 3-year- old children with an arbitrary rule for a game involving yellow and orange balls. For half the children the rule was provided with deontic language (e.g., "you should use the orange balls"), and half were not (e.g., "use the orange balls"). Additionally, half the children were given a social-conventional rationale (e.g., "everyone does it that way"), while the other half were given a moral rationale (e.g., "it's the right thing to do"). If children understand that deontic logic applies even to social-conventional rules, then we expect that they will comply with the arbitrary game rule most when the rule is provided with deontic language and a moral rationale. This research will help parents and early childhood caregivers to better understand how young children view social-conventional rules. This in turn will provide insight into how these social conventional rules, which are highly valued and critical to learn, might best be taught within families, day cares, and classrooms.

Organic Farm Environmental Design

Presenters: Adam Zabrodski, Ryan Janzen, Geoff Eichhorn, Julia Sellars,
Geological Engineering

Faculty Supporter: Dr. Vicki Remenda, Geological Sciences & Geological Engineering

Organic farming has regulations for water and soil quality that must be met in order to become certified. A farm approximately 50 km from Kingston is trying to convert to a certified organic operation to supply Queen's University with domestic produce. To ensure the farm can be certified, extensive testing of the

water and soil is necessary to ascertain that the property is free from contaminants. Monitoring wells were installed on the property and water samples were tested to ensure they met regulations, as were soil samples. The soil was also classified for its suitability for agriculture. GPS and Geophysical surveys were implemented to model the bedrock and map the height of the water table to determine groundwater flow in the area. To promote sustainability, a literature review of alternative energy sources was completed including the applicability of wind, solar, and geothermal energy as well as biodiesel. This research in conjunction with field-testing was used to decide on a final design for the farm, including water management, suggested energy sources, and agricultural land used.

Interprofessional Curriculum for Regulated Health Care Professions in Ontario: Continuing Education Scoping Review

Presenter: Jennifer Day, Nursing

Faculty Supporters: Dr. Jennifer Medves, Nursing; Janice P. Van Dijk RN MHSc MSc
BEEd; Marcy Saxe-Braithwaite RN MBA MScN

The Queen's University Interprofessional Working Team, as part of the Interprofessional Education (IPE) Curricula Models for Healthcare Providers in Ontario (IPECM) working group, has been tasked to present a scoping review of existing national and international interprofessional education programs and to develop a guiding curriculum framework for pre-registration, continuing education and post- registration health provider education. Achieving this project's aims will ultimately provide a foundation that promotes collaborative, patient-centred practice by utilizing the skills, knowledge and scope of practice of all members of the health care team. The current scoping review of interprofessional continuing education programs for the 21 regulated health professions and social work in Ontario will be presented here. A comprehensive scoping review of voluntary and suggested IPE continuing-education programs available for registered health care professionals was investigated. Both peer, and non-peer reviewed literature, as well as grey literature, from sources such as university/ college websites and professional organizations, were examined. Identified gaps in research include a widespread lack of IPE curriculum documentation in research as well as few available IPE continuing education programs. Some barriers enabling these shortfalls may include lack of funding, lack of human resources, and lack of support, experience and knowledge in developing interdisciplinary programs. Next steps include synthesizing and summarizing the current available training courses and modules for each regulated health profession. These summaries will be integrated with the pre- and post-registration scoping review and guiding curricula framework.

Session VI: Relate ∞ Connect

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

Thursday, March 5, 3:45-4:45

Moderator: Dr. Stephanie Dickey, Art and Art History

Audience Expectations of Autobiographical Performance

Presenter: Ashley Williamson, Drama

Faculty Supporter: Dr. Jenn Stephenson, Drama

The relationship between performers and the audience is built on the creation of fictional worlds by the actors and the acceptance of what is real or not within these worlds by both the performer and the actor. Metatheatre, or theatre that is self-reflexive or aware of its theatricality, fosters a relationship with the audience that is more complex and nuanced than the one that occurs in regular theatre. The created worlds in metatheatre and the characters that populate them can collapse on themselves making the audience's task of determining the truth more difficult. An audience's relationship with the performer

becomes convoluted when the play is an autobiographical solo show. In this circumstance, the audience expects realness and is less willing to see lines between worlds blur. This presentation will investigate why the audience needs such realness and truth from autobiographical solo shows when it is willing to overlook it so often in other performances. The talk will include an autobiographical performance to exemplify the audience-performer relationship identified within the presentation.

The Role of Psychological Attachment in Trust Violation and Repair

Presenter: Antonia Dangaltcheva, Psychology

Faculty Supporter: Dr. Susan Brodt, Business, Psychology

Interpersonal trust is the willingness to accept vulnerability based upon positive expectations about another person's behaviour. A breach in trust occurs when these expectations are not met. Apologies are one way to restore trusting relations and encourage forgiveness. Because past relationships may affect both trust development and forgiveness, I draw on psychological attachment theory for insight into the nature of people's past relationships. A person may develop one of three attachment styles: secure, anxious, or avoidant. A secure style represents a normal healthy relationship, whereas anxious individuals cling to others and fear rejection and avoidant individuals are self-reliant and distance themselves from others. This laboratory experiment tests the extent to which individuals with different attachment styles develop trust with a stranger, change their emotions and reported trust levels after the trust has been violated, and respond to an apology designed to repair trust. To develop trust in the laboratory, participants share information about themselves and complete an obstacle course while blindfolded. Trust violation then occurs during a planned activity early in the experiment, after which half of the participants receive an apology and the other half do not. Questionnaires then assess levels of emotion and trust, which are compared between individuals in the apology and no-apology conditions. This research may help establish a close relationship between attachment style and trust violation and repair. Future research may look into other ways to repair trust, particularly for insecure individuals who may not respond positively to an apology.

Trust Repair and Self-Affirmation: The Effect of Engaging in a Self-Affirming Activity on Trusting Behaviour after a Trust Violation has Occurred

Presenter: Jessica Barr, Psychology

Faculty Supporter: Dr. Susan Brodt, Business, Psychology

Interpersonal trust and cooperative relationships are essential in workplace and social settings. Interpersonal trust is an attitude that reflects a willingness to be vulnerable to another person based on the expectation that he or she will act benevolently. A trust violation occurs when an individual's expectations about the way a person would act have not been met. According to self-affirmation theory, people are motivated to protect their sense of self-worth. If someone experiences a threat to their self in one domain, they can satisfy the self-affirmation motive by affirming an aspect of their identity in a different domain. The purpose of this study is to look at how self-affirmation influences trust violation and repair. I examine whether engaging in a self-affirming activity, prior to or following a trust violation, increases an individual's subsequent trusting behaviour. Participants share personal information and complete an obstacle course task with a confederate to develop trust. They then play a money game in which the confederate breaks participants' trust by sharing less money than expected with the participant. In two conditions participants complete an affirming writing task either prior to or following the violation; in two other conditions, they complete a non-affirming writing activity prior to or following the violation. There is also a no-writing control condition. Subsequent trusting behaviour and attitudes are measured using questionnaires and tasks. This research identifies factors that help manage trust violation and restore trust, which is essential to effective relationships in the workplace.

Session VII: Natural ∞ Capital

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

Friday, March 6, 9:30-11:10

Moderator: Dr. Neal Scott, Geography

Assessing the Role of Integrated Research and Monitoring Tools in Remediation Efforts at Great Lakes-St. Lawrence River Basin Areas of Concern: A Case Study of the Bay of Quinte Remedial Action Plan

Presenter: Michelle Berquist, Environmental Studies

Faculty Supporters: Dr. Linda Campbell, Environmental Studies and Biology; Dr. Graham Whitelaw, Environmental Studies

In accordance with the Great Lakes Water Quality Agreement, the governments of Canada and the United States have agreed to support the remediation of 43 Areas of Concern (AOC) where "failure [to meet objectives of the agreement] has caused or is likely to cause impairment of beneficial use or of the area's ability to support aquatic life." A Remedial Action Plan (RAP) has been created for each AOC that outlines how impairments are to be addressed. This presentation will focus on one such plan, the Bay of Quinte RAP, as a case study to explore the role of research and monitoring in realizing the aims of the policy. Results will be based on a literature review encompassing existing works about Great Lakes RAPs, the Bay of Quinte watershed, multi-party monitoring and the relationship between science and policy, along with semi-structured interviews with project leaders and community stakeholders to determine how practice at the Bay of Quinte compares to theory and to practice at other Areas of Concern. The results will be instructive for any groups planning a multi-stakeholder undertaking particularly those involved in any of the 40 other RAPs still underway on our Great Lakes.

Tracing the Migration of Low-level Radioactive Waste Using Rn-222 as an Indicator of Hydrogeological and Geochemical Conditions

Presenter: Matt Herod, Geological Sciences

Faculty Supporters: Dr. Heather Jamieson, Geology; Dr. Kent Novakowski, Civil Engineering; Tom Gleeson, PhD Candidate, Civil Engineering

Port Hope, Ontario, located on the north shore of Lake Ontario, is home to some of the largest amounts of low-level radioactive waste contamination in the world. The waste is enriched in ^{238}U and ^{226}Ra , both of which decay into the invisible, radioactive gas radon-222 (^{222}Rn). This project is an attempt to determine the amounts of ^{222}Rn that have migrated from scattered waste sites into selected streams and groundwater in the local watershed. This knowledge can be used to predict hydrogeological and geochemical conditions within the sample stream and surrounding area.

Vegetation Effects on Soil Properties in the Montegale Sandy Loam Series: Implications for Land-use Change

Presenter: Allison Neil, Geography

Faculty Supporter: Dr. Neal Scott, Geography

Soil properties are strongly influenced by the composition of the surrounding vegetation. We investigated soil properties of three ecosystems; a coniferous forest, a deciduous forest and an agricultural grassland, to determine the impact of land use change on soil properties. Disturbances such as deforestation followed by cultivation can severely alter soil properties, including losses of soil carbon. We collected nine 40 cm cores from three ecosystem types on the Roebuck Farm, north of Perth Village,

Ontario, Canada. Dominant species in each ecosystem included hemlock and white pine in the coniferous forest; sugar maple, birch and beech in the deciduous forest; grasses, legumes and herbs in the grassland. Soil pH varied little between the three ecosystems and over depth. Soils under grassland vegetation had the highest bulk density, especially near the surface. The forest sites showed higher cation exchange capacity and soil moisture than the grassland; these differences largely resulted from higher organic matter levels in the surface forest soils. Vertical distribution of organic matter varied greatly amongst the three ecosystems. In the forest, more of the organic matter was located near the surface, while in the grassland organic matter concentrations varied little with depth. The results suggest that changes in land cover and land use alters litter inputs and nutrient cycling rates, modifying soil physical and chemical properties. Our results further suggest that conversion of forest into agricultural land in this area can lead to a decline in soil carbon storage.

Using Thermal Profiling as an Indicator for Groundwater Discharge

Presenter: Jamie Ricci, Geological Sciences

Faculty Supporter: Dr. Vicki Remenda, Geological Sciences & Geological Engineering

Temperature can be used in order to selectively and intelligently deploy monitoring wells to measure groundwater discharge to surface water. The temperature of Groundwater is constant, reflecting average annual temperature, whereas the temperature of surface water fluctuates daily and seasonally. The contrast can be found by scanning sediment for variations in temperature. In effect, this disparity causes 'cold spots' in surface water, such as lakes, which are often felt by swimmers as a brisk interruption to the warmth of the lake. This technique of scanning shorelines for evidence of groundwater discharge to surface water was employed at three locations. These sites are all located in Ontario; one, Victor, is in the James Bay Lowlands, while the remaining two, Frontenac Landfill and the Former Davis Tannery, are in southeastern Ontario, namely Kingston. Victor is a pristine location, while the two in Kingston are both contaminated. Each has limestone bedrock overlain by glacial sediment and wetlands. The two in southern Ontario have marshes, while the site in northern Ontario is a peatland. The climate of the Kingston locations is temperate and continental with influence of the Great Lakes whereas Victor is subarctic and wet. The stratigraphy, or succession of sediments that overly the bedrock, has been heavily disturbed by anthropogenic processes at the two sites in Kingston, making groundwater flow difficult to predict. Determining groundwater discharge will aid other work at each site. At the Former Davis Tannery it is critical to trace contaminants, particularly fugitive emissions that may discharge into adjacent surface water. At Frontenac, the study will help understand the implications of the landfill on the marsh which flanks it. Furthermore, the study of groundwater discharge at Victor can provide information about the hydrogeology of the region, as few studies have taken place in this region until recently. Two different types and probes of various lengths were manually inserted into sediment to identify temperature differences. Location and temperature readings were recorded. The range of temperatures at each site was as follows: Frontenac (10.2°C to 13.4°C), Victor (0.5°C to 20.4°C), and the Former Davis Tannery (8.2°C to 23.1°C). These differences indicate that thermal profiling can be used in order to scan for groundwater discharge. Furthermore, the ease with which this method can be accomplished makes it a viable solution for consulting firms, researchers, or others looking to characterize groundwater/surface water interactions.

Investigating Common Carp (*Cyprinus carpio*) as a Novel Feed Ingredient for Diets of Farmed Carnivorous Fish

Presenter: Owen Skipper-Horton, Biology

Faculty Supporters: Dr. Bruce Tufts, Dr. Yuxiang Wang, Biology

Over 60% of natural fish stocks are either fully-exploited or overexploited. This declining productivity has led to the rapid growth of the aquaculture industry, or the farming of fish. All fish require a certain level of protein from marine sources, most often provided in the form of fishmeal. Fishmeal is produced

using species from the low end of the food chain, such as menhaden or sardine, which usually have low market value. Carnivorous species, such as salmon and trout, are particularly popular in Western markets, but also demand relatively more wild inputs than omnivores/herbivores. While species of the latter, such as carp and catfish, are popular in Asia, they maintain low commercial value in North America. Carp was thus investigated as a source of fishmeal for the growth of a carnivorous species, Rainbow Trout (*Oncorhynchus mykiss*). Fish were grown in three separate treatment groups, each being fed either a commercial sinking pellet, a unique pellet with commercial herring meal, or a unique pellet with carp meal. Upon determination of crude protein and energy content of the carp meal, diets were balanced on a crude protein and digestible energy basis. Pellets were made using a meat grinder. Trout were fed pellets with an increasing carp meal:herring meal ratio, and palatability was determined using the amount of pellets consumed (g) per mean mass of rainbow trout group (g).

Session VIII: Innovation ∞ Ideas

Stauffer Library 121, Queen's Learning Commons, Stauffer Library

Friday, March 6, 9:30-11:10

Moderator: Dr. Tom Harris, Chemical Engineering

The Astrological Texts of King Alfonso X of Spain, and His Contribution to Modern Science

Presenter: Alicia Finan, Classics

In modern Western society the study of astrology is not taken seriously by the majority of people. However, in the medieval period astrology was held to be a hard science. Astrology was studied in the East long before it came to be pursued by Western scholars. The 8th century A.D. Moslem invasion of Spain meant that much of this knowledge was brought to Europe. One of the key figures in the reacquisition of this knowledge was King Alfonso X, known as El Sabio, or The Wise, for his love of learning. Shortly after his coronation he established groups of translators at his court in Toledo who were responsible for translating texts from their original language into Spanish. The majority of the works he ordered to be translated were Eastern texts on the sciences, the majority of Arabic origin. In particular he had a great interest in the study of astrology, and included many Eastern astrological texts in his library. In addition to translation Alfonso occasionally expanded upon the work of the Eastern scholars, contributing his own observations to theirs. In this paper I give an overview of the contributions Alfonso made to the study of astrology, with particular focus placed upon two of his works: *Lapidario*, and *Libro de formas e ymagenes*, both of which study the relationship between astrology and stones. These texts demonstrate scientific experimentation and analysis in its earliest stages and by studying these documents, the role of Alfonso X in the development of modern Western science can clearly be seen.

Sin and Wikipedia: Mass Communication in the 21st Century

Presenter: Celine Song, Psychology

Using French philosopher Gabriel Marcel's influential work on technology as a jumping point, this paper takes a critical look at the nature and power of 21st century's major technique of mass communication. Marcel discusses the topic in his book *Man and Mass Society* using the time-sensitive example about radios, used as a major means to propaganda and human degradation back in WWII. But what would he say about internet in the 21st century? Mass media is so powerful in Marcel's opinion that it "usurps a prerogative which looks like a distorted analogue, a caricature, of divine omnipresence". Although Marcel's worry about communication technique that "what starts off as a collection of means [...] become the centre, the focus, of an obsessive cult" is a valid one, internet's problem of "too much information" and its innate interactivity are effective antidotes to many of such dangers. The

impossibility of propaganda in the 21st century, the active membership and impotence of an individual internet user, and the non-uniformity of internet are also discussed in depth.

Intellectual Property Challenges: Unshackling Innovation

Presenter: Chris Palmer, Engineering Chemistry

Last year I was co-investigator on an award winning research project that sought to improve sustainable energy technology. Our project optimized dye-sensitized solar cells, which are cheaper and more environmentally friendly than traditional solar cells. We discovered that adding a certain material results in approximately a 10% increase in efficiency. Although I would like to, I cannot share any more details because of intellectual property issues. This seems odd considering the intent of the project; however, it is a common and valid concern for researchers because of current intellectual property law. An inventor has no claim to an invention until it is patented. The expense of patenting forces people to hoard their ideas even if they do not want the patents for themselves. Though ideas could benefit society, inventors must conceal them lest a greedy entity patent them and prevent their free use. To remedy this problem I propose the establishment of an institution that would pay for patent applications, provided that after the patent is granted only a minimal fee is charged for use of the patent. This fee would compensate the inventors reasonably, pay upkeep costs of the institution and possibly fund a grant agency. This would encourage innovation by allowing free exchange of ideas without fear of intellectual robbery or loss of credit to the inventor, facilitating more productive and expedient research. The institution would afford society virtually free use of technologies with the consent of the inventor, making widespread implementation of new technologies more feasible.

Intellectual Property Rights, Biotechnology and Discourses of Development: Internal Contradictions and Forms of Resistance

Presenter: Krishana Persaud, Global Development Studies

Faculty Supporter: Dr. Marcus Taylor, Global Development Studies

The International Covenant on Economic, Social and Cultural Rights identifies freedom from hunger and malnutrition as a fundamental human right of every individual. The current global food crisis undermines this right and has multi-faceted repercussions for poverty reduction and sustainable development in the Global South. A plethora of explanations have been proposed regarding the causes of the current food crisis, while a biotechnological solution involving the expansion of Genetically Modified (GM) seeds in the Global South has gained renewed momentum and simultaneously increased resistance. This presentation will provide a nuanced understanding of the promotion of IPRs and biotechnological 'inventions' as contemporary facets of a hegemonic modernization discourse of development. By first critically examining the development of IPRs and their relation to biotechnology I provide a basis for understanding the internal contradictions of this technologically reductionist discourse. Using a detailed case study from India, I then illustrate the way in which the internal contradictions of this discourse result in particular forms of resistance which significantly challenge the structure of the global food system.

Application of Nano-Structured Ceramics to Gas Turbine Components – Material and Fabrication Process Selection

Presenters: Kadra Branker, Louis Liao, Mechanical and Materials Engineering

Faculty Supporter: Dr. Mark Daymond, Mechanical and Materials Engineering

The ever increasing demand on the aerospace industry to improve efficiency has pushed the evolution of turbine technology. A fundamental approach to improve the efficiency of the turbine is to increase the operational temperature. Nano-structured materials present a possible means of achieving higher operating temperatures in turbines over the limits of current materials (nickel based superalloys).

Superalloys have a fairly short rupture life as the strength drops off quickly in operation at high temperature for long periods of time, leading to the failure of the component. Ceramics are able to operate at much higher temperatures than metals; however, existing fabrication techniques had not been able to make dense conventional ceramics with the desired long term properties. Nanostructured materials (grain size <100 nm) have been observed to exhibit unique and often superior properties as compared with their conventional grain size counterparts. New innovation in nanostructured ceramics and sintering techniques provide insight into solving the problem of using ceramics in turbine components. In this presentation, the benefits of nanostructured materials, their mechanical properties and their high temperature performance will be discussed. The fracture strength of microstructured and nanostructured high temperature resistant ceramics will be found to evaluate the best candidate for this application. Through available research, we will demonstrate the superior properties of our chosen two-phase nanostructured Silicon Carbide-Silicon Nitride (SiC-Si₃N₄) Ceramic, which is manufactured using Spark Plasma Sintering.

Session IX: Represent ∞ Imagine

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

Friday, March 6, 1:00-2:20

Moderator: Dr. Susan Wilcox, Women's Studies

Trashed

Presenters: Ashley Peoples, Caitlin Stanley, Justine Labute, Sacha Atherly,
Beth Turcon, Drama

Faculty Supporter: Dr. Julie Salverson, Drama

Our performance piece, entitled *Trashed*, initially grew from three central questions 1) What is the role of testimony in recording history and/or current affairs? 2) What role can theatre play in communicating personal testimony? and 3) How does a person (or people) perform testimony? To explore these questions, we took on the following personal testimony: A young man in high school was giving blood and 45 minutes in, the administrators re-read his form, realized he had checked the box saying he had had sex with a man (since 1977) and promptly took his bag of blood and dropped it in a garbage can. We were all struck by this story and particularly by the image of blood in a garbage can; however, as five heterosexual women we were unsure if and how we could communicate the testimony to an audience. Working from the idea that our responsibility to the issue is our "ability to respond," our performance piece became a manifestation of these abilities. We chose to use movement-based clown to enter and explore the material from a neutral space—clown negates specific characteristics such as gender or social orientation. Combining objective fact with clown allowed us to visually represent the issue, our confusion surrounding the issue and our physical disconnect with the issue as performers. Our hope is to achieve a performance that serves the original testimony emotional justice while allowing an audience to engage with the related issue on multiple levels.

A Different Perspective on Canadian History: The Canadian Wing of the Art Gallery of Ontario's New Design

Presenter: Jackie Sevcik, Art History

The issue of representation within the grand Canadian historical narrative is a topic that re-opens previous notions about the accepted version of the Art Historical canon. While there are many aspects of Canadian Art History that are celebrated as true notions of national identity, there are many indigenous groups and ideas that do not meet the criteria to be included in the canon and are thus, not represented. This paper examines the contemporary Canadian Wing at the Art Gallery of Ontario (AGO) and will focus on showing the changes made to the gallery and how this will help Canadians understand what it means

to be Canadian. What is interesting about this newly renovated wing is that the curatorial staff has successfully managed to show Canadian history from a contemporary perspective. By choosing to recognize the importance of different aspects of Canadian history to the understanding of Canadian identity, the AGO takes old practices and turns them into new traditions.

A Review of Gandhi, Father of a Nation or a Mahatma?

Presenter: Shezan Muhammedi, History

Faculty Supporter: Dr. Ishita Pande, History

Mohandas Gandhi is a legend among the world's greatest men. His many selfless acts were able to unite a nation and remove the British from colonial India. Gandhi is responsible for leading the establishment of an independent India, free from foreign intervention. However, was he mistaken to be a mystic, a sorcerer, the father of a nation or a great Mahatma? Were these attributions part of Gandhi's true intentions or did he use the proclaimed titles as a political tool for the advancement of the nationalist campaign? Academics who specialize in modern Indian history have claimed Gandhi to be the father of a nation and a great soul or more famously known as the Mahatma. An analysis of two works, the first being *Gandhi as Mahatma: Gorakhpur district, Eastern UP, 1921-1922* by Shahid Amin and the second entitled, "Father of the Nation" in *Gandhi in His Time and Ours* by David Hardiman. Both works make claims as to Gandhi's self-righteous and father titles. However, upon further discussion it will be proven that Gandhi sought never to attain such grandiose titles; it was against his intentions. As Gandhi's influence grew throughout the Indian subcontinent so did the titles bestowed upon him by Indians. He was wrongly associated with deities and parental roles. The accomplishments of Gandhi will forever be admired by mankind as a whole yet Gandhi did not seek to be remembered as a Mahatma or Father.

Art, Death, and Science: The Skull in Dutch Still Life Painting

Presenter: Jiaqi (Angela) Sun, Art History

Faculty Supporter: Dr. Stephanie Dickey, Art History

Vanitas is a type of still life popular in European art that usually includes items that symbolize the transience of life and the emptiness of earthly accomplishment. The most commonly depicted object in *Vanitas* images is a skull. In the 17th-century, *vanitas* still-lives flourished in the Netherlands and especially the city of Leiden. It has been generally agreed among scholars that this phenomenon was a result of Leiden's unique cultural atmosphere. In 1575, when Leiden University was established, it quickly became one of the leading intellectual institutions in Europe, attracting an international community of renowned humanist scholars and scientists. Since the university was heavily under the influence of Calvinist and Neo-Stoicist scholars, whose philosophies emphasized greatly the "brevity of life", it has been accepted that this cultural atmosphere promoted the vogue for *Vanitas* Still lifes in Leiden. However, there is another strong intellectual force in the city that has been overlooked by art historians, the rapid development of scientific studies and the formation of 'curiosity cabinets', where natural and artistic artefacts were displayed together. There were a number of prominent scientists who researched and taught in Leiden University, and they often held labs and demonstrations of anatomy dissection for the public. Furthermore, according to several inventories from the time, people also collected skulls as precious objects. Hence, I would like to propose that the great interest in science, shared by scholars and the public, was an alternative factor that pushed *Vanitas* painting to its high point in Leiden.

Session X: Action ∞ Reaction

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

Friday, March 6, 2:30-3:50

Moderator: Dr. Brian Frank, Electrical Engineering

Biological Motion Detection in Rats

Presenter: Laura MacKinnon, Psychology

Faculty Supporter: Dr. Hans Dringenberg, Psychology

This study will examine the rodent visual system by assessing whether they can discriminate between various biological motion point-light displays. Pilot data suggests that rats can discriminate between a human walker point-light display walking left and right. Therefore this study will investigate which kind of information rats use to differentiate biological motion; the overall shape of the moving body (conformational theory) versus the local movement of the feet (ballistic motion theory). First, we will train the rats to discriminate between human point-light displays walking in opposite directions using a modified Morris water maze. Then we will observe their reactions to a backwards-walking display. If the rats use shape as a visual cue for biological motion, they will swim towards the goal arm that corresponds to the direction the backwards walker is facing. However, if the rats use ballistic motion as a visual cue for biological motion, they will swim towards the goal arm that corresponds to the direction the backwards walker is moving. We hypothesize that rats use the ballistic motion of the feet as a cue for life detection. This is the first study to investigate whether rats can detect biological motion, and will contribute to the theory that animals have evolved an innate ability to quickly detect biological motion of vital importance.

The Effect of Scene Context on Visual Search in Real-World Scenes

Presenter: Samia Hussein, Psychology

Faculty Supporter: Dr. Monica Castelhano, Psychology

The present study examined the effect of scene context on guidance of attention during visual search in real-world scenes. Prior research has demonstrated that when searching for an object, attention is usually guided to the region of a scene that most likely contains that target object. This study examined two possible mechanisms of attention that underlie efficient search: enhancement of attention (facilitation) and a deficiency of attention (inhibition). In this study, participants (N=20) were shown an object name and then required to search through scenes for the target while their eye movements were tracked. Scenes were divided into target-relevant contextual regions (upper, middle, lower) and participants searched repeatedly in the same scene for different targets either in the same region or in different regions. Comparing repeated searches within the same scene across different regions, we expect to find that visual search is faster and more efficient (facilitation of attention) in regions of a scene where attention was previously deployed. At the same time, when searching across different regions, we expect searches to be slower and less efficient (inhibition of attention) because those regions were previously ignored. Results from this study help to better understand how mechanisms of visual attention operate within scene contexts during visual search.

Dichotomy in Biological Motion Perception: Pigeons Use Feet Local Motion to Determine Direction

Presenters: Michelle Tong, Priyanka Mensinkai, Psychology

Faculty Supporter: Dr. Nikolaus Troje, Psychology

The study examines the visual processes underlying the detection of the motion of land animals, or biological motion. The ability to process the motion of other living beings has profound ecological implications in the wilderness and in our everyday life. Earlier models suggest that there are two distinct ways to process this information. One uses the shape of an entire figure and one uses the motion of one part of the body. In this experiment, we aim to study whether the local motion of the feet or the configuration of the body is used to determine the direction into which a figure is facing. We do this by training pigeons to discriminate facing direction of a stationary walking point-light figure. Pigeons chose one of two walkers by pecking on a touch screen. Once the task was learned, catch trials of backwards walkers were introduced. This kind of display gives the pigeon opposing information about direction. While the shape of the walker tells them it is walking one way, the feet give the impression that it is moving in the other. Pigeons were successful in learning to discriminate directions and at the introduction of the catch trials, most birds used the local motion cue of the feet to determine direction. The results indicate that pigeons seem to be using the feet, rather than the shape of a figure, to process direction of movement. In conjunction with previous literature, this study suggests that there exists an innate "life detector" specialized for filtering the movement of the feet.

Can Right Ventricular Lead Position Influence Paced QRS Duration in Patients with Abnormal and Normal Left Ventricular Function?

Presenter: Melissa Moey, Life Sciences

Faculty Supporter: Dr. Damian P. Redfearn, Arrhythmia Services, KGH

Right ventricular apical pacing (RVAP) in pacemaker or implantable cardioverter-defibrillator (ICD) therapy has been associated with the development and exacerbation of heart failure (HF). Studies have suggested that RVAP resulting in dyssynchronous left ventricular (LV) activation and prolonged QRS duration leads to progressive mechanical dysfunction, decreased systolic function and increased mortality. These data suggest that the effect may be most pronounced in patients with pre-existing LV systolic dysfunction. Pacing at the RV septum however has demonstrated narrower paced QRS durations and is being considered as an alternative pacing site to the RVA. In this study, the effect of RV lead placement on the QRS duration in patients with LV systolic dysfunction who demonstrate a left ventricular ejection fraction (LVEF) $< 35\%$ and normal LVEF was compared. Patients of a minimum age of 18 years with LVEF $\geq 50\%$ (normal cohort) and LVEF $\leq 30\%$ (HF cohort) were recruited. Four 3 minute high resolution recordings were obtained from an orthogonal lead position for subsequent offline signal averaging. Recordings of native rhythm and pacing at three RV sites: right ventricular outflow tract (RVOT), mid-septum and RV apex (RVA) were obtained. A 12-lead electrocardiogram (ECG) recording at each pacing site was stored for later confirmation of pacing location and comparison with paced averaged QRS duration. The QRS duration at different RV sites in the two populations was then compared. As studies to date are limited, this study provided valuable insight on RV lead placement on QRS duration in device therapy for HF treatment.

POSTER PRESENTATIONS

Session XI: Poster Presentations

Queen's Learning Commons, Stauffer Library

Presenters will be present at posters Friday, March 6, 11:30-1:00

Posters will be on view March 5 & 6

1. Heme Oxygenase-1 Enzyme Deficiency Affects Uterine Natural Killer Cell Function During Murine Pregnancy

Presenter: Tracy Zhang, Anatomy and Cell Biology

Faculty Supporter: Dr. Anne Croy, Anatomy and Cell Biology

Recurrent miscarriage is a condition that affects 1% of all women, and rejection of the fetus by the mother's immune system is thought to be one of the underlying causes. The mechanisms of maternal tolerance vital to a successful pregnancy are not well understood; however, uterine natural killer (uNK) cells are implicated as they comprise over 70% of immune cells in the uterus during early pregnancy. Heme oxygenase-1 (HO-1) is an enzyme that is known to be immunosuppressive. Moreover, mice missing HO-1 have extremely high abortion rates. This study is the first to analyze the effects of HO-1 deficiency specifically on uNK cells. We posit that an absence of HO-1 affects normal uNK cell-mediated immunosuppression, and also possibly their ability to modify uterine spiral arteries supplying blood to the fetus. Our study analyzed embryos from mice lacking or deficient in HO-1 on days 8, 10, and 12 of pregnancy. Both number of uNK cells and degree of vascularization were analyzed using immunohistochemistry staining. We observed a significantly higher number of uNK cells in one area of the embryo implantation site and a significantly lower number of cells in another, suggesting the uNK cells are failing to localize properly. Analysis of vascularization is currently ongoing. Since women with multiple miscarriages have been shown to down-regulate HO-1, confirmation that absence of HO-1 leads to implantation site abnormalities could pave the way for future clinical treatments.

2. Immunolocalization of Cystatin-Related Epididymal Spermatogenic (CRES) Protein in Mouse Spermatozoa

Presenter: Marvin Ferrer, Life Sciences

Faculty Supporter: Dr. Richard Oko, Anatomy and Cell Biology

CRES is an inhibitor of a specific member of an enzyme family called serine proteases. It is thus thought to play a role in enzymatic regulation. It has been shown to be expressed only in the testes, epididymis, sperm, and gonadotropic cells of the anterior pituitary gland. Localization of CRES in sperm is an important step in determining its role within sperm. Previous studies have shown CRES to be localized in the mouse acrosomal cap: a vesicle on the tip of the sperm head which releases its contents upon initial sperm-egg contact. The present study shows that developmental analysis of spermatogenesis via immunohistochemistry is incompatible with the conclusion that CRES is localized in the acrosomal cap. CRES expression begins in the elongating spermatid stage of sperm development; by this point, the acrosomal cap has been completed and it has never been shown that further additions to it can occur. Western blot and immunogold electron microscopy shows that CRES is localized in the sperm tail. It is also possible that further CRES is placed on the outer sperm membranes on the head as it travels through the epididymis, which is a part of the male reproductive tract.

3. Comparing the Induction of CYP1A in American Eel (*Anguilla rostrata*) and Rainbow Trout (*Oncorhynchus mykiss*) by the Dioxin-like Compound 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Presenter: Geoff Cutler, Environmental Studies

Faculty Supporter: Dr. Peter Hodson, Biology and Environmental Studies

The American eel population native to Lake Ontario has declined by 98% since 1985, and the associated fishery in Ontario has been rendered uneconomical. By recognizing the American eel as a “species of concern” under Canada’s Species at Risk Act, the federal government has indicated that conservation of this population is a priority. Conservation is a difficult task, however, considering the underlying mechanism of decline remains unknown. One hypothesized mechanism states that dietary bioaccumulation of dioxin-like compounds (DLCs) by the female and transfer of these environmental contaminants to her eggs precludes proper development of eel embryos and larvae. These developmental effects have been well characterized in the rainbow trout, and include craniofacial malformations, edema, hemorrhaging, increased mortality, and up-regulation or induction of the CYP1A enzyme. Therefore, increased CYP1A concentrations may be used as a biomarker for potential toxicity, and a quantitative means of comparing the sensitivity of different organisms to DLCs and their effects. My project uses immunohistochemistry (IHC) and the EROD assay to quantify CYP1A induction in American eel exposed to DLCs, and compares this sensitivity to that of rainbow trout, a reference species. Preliminary EROD results suggest no significant difference between eels and rainbow trout, and results of IHC analysis are currently under examination. If these data suggest an increased sensitivity of the American eel to DLCs, this would substantiate the hypothesis that chemical accumulation in adult eels and exposure to eggs during oogenesis may threaten the viability of embryos and larvae, which would precipitate the catastrophic population decline.

4. Diatom-based Paleolimnological Assessment of Long Term Water Quality Trends, Near Forrest Island, Lake of the Woods, Ontario

Presenter: Ashley Jenkin, Biology

Faculty Supporters: Dr. Brian Cumming, Dr. John Smol, Dr. Kathleen Rühland, Biology

Lake of the Woods (LOW) is a large, international freshwater body that shares borders with Ontario, Manitoba, and Minnesota. Previous studies from the LOW have found that water quality is spatially variable in this complex lake. The current perception is that cyanobacterial blooms have increased in frequency and intensity, generating much interest in determining whether increased nutrients have resulted in water quality deterioration. To address this concern, paleolimnological techniques will be used to examine changes in diatom assemblage over the last ca. 200 years on a dated sediment core retrieved near Forrest Island, close to the city of Kenora, Ontario. Comparisons will be made to other LOW sites that are elevated in total phosphorous (TP) and experience algal blooms (impact sites) as well as a site with low TP that does not experience algal blooms (reference site). Based on the Forrest Island diatom shifts, the following questions will be examined: (1) What is the baseline condition of this site? (2) Have diatom assemblages and/or water quality changed over time? (3) If so, are these changes comparable to other LOW sites?; and (4) What are the potential mechanisms for these changes? To aid our interpretation, a diatom-based inference model for TP will be applied downcore to examine whether TP concentrations have changed over the last few centuries. Additionally, other mechanisms such as recent warming will also be examined. Results from this study could have important implications related to the impacts of multiple stressors on the LOW.

5. Attitudes on Investment in Descendants: Products of Evolution?

Presenter: Aaron Myran, Biology

Faculty Supporter: Dr. Lonnie Aarssen, Biology

This study aims to examine intergenerational equity (concern for future generations) from a human evolutionary ecology perspective. The extent to which males and females differ in their concern about the welfare of future generations can be interpreted as a product of natural selection. We hypothesized that reproductive advantage is conferred upon males by discounting future generations and focusing on their immediate well being. Given that males potentially have many children, and do not invest the same resources in raising children, it is to their reproductive advantage to focus on the present and their own wellbeing, so that they can continue to reproduce. It is hypothesized that reproductive advantage would be conferred upon females who are concerned about future generations. Females potentially have fewer children and invest more in raising children. It is therefore more to their reproductive advantage to ensure that children survive to adulthood. Using a between-subjects design online survey, emailed to individuals in the Queen's Community (Students, Staff, Faculty, and Alumni), we asked participants to indicate what proportion of available money (\$10, 000 they received by chance) they would allocate to mitigating a hypothetical food crisis (collectivist option) versus to three "individualist" options. Participants were randomly assigned to hypothetical scenarios where the food crisis affected: the participant's generation, their children's generation, their grandchildren's generation, or their great-grandchildren's generation. In all four scenarios, we found that males invested significantly less in mitigating the food crisis than females. Additionally, we found that neither males nor females differed significantly between scenarios in the amount they invested in mitigating the food crisis.

6. Mental State Decoding in Dysphoric Individuals: The Role of Motivation

Presenter: Brooke Sinclair, Psychology

Faculty Supporter: Dr. Kate L. Harkness, Psychology

Depression is associated with pervasive impairments in social and interpersonal functioning. Research demonstrates that individuals with depression have difficulty interacting with peers and show lower levels of social activity than do nondepressed individuals (Levendosky, Okun, & Parker, 1995). In addition, depressed individuals report that their social interactions are less supportive and less rewarding than those of non-depressed individuals (Nezlek, Hampton, & Shean, 2000). This reduced social competence may cause depressed individuals to disengage from social interaction, which may in turn exacerbate their state of depression (Rippere, 1980). It is thus important to understand and identify the mechanisms beneath these deficits. Researchers commonly use the theory of mind framework to understand impaired social functioning in clinical conditions. Theory of mind refers to the ability to make judgments about others' mental states to understand and predict their social behaviour. Research has found a relationship between theory of mind and dysphoria (i.e., elevated scores on a measure of depression symptoms, but not necessarily a diagnosis of clinical depression). Specifically, dysphoric individuals demonstrate enhanced mental state judgments (Harkness, Sabbagh, Jacobson, Chowdrey, & Chen, 2005). My research investigates social motivation as an underlying mechanism for dysphoric individuals' enhanced decoding ability. A sample of undergraduates will participate in a theory of mind decoding task following social, monetary or no motivation. I hypothesize that dysphoric individuals will make significantly more accurate judgments than non-dysphoric individuals. Further, I predict that social motivation will enhance non-dysphoric individuals' sensitivity to others' mental states.

7. An Examination of the Use of *Salix Arctica* for Dendrochronological Studies in the Arctic

Presenter: Anthony Bassutti, Geography

Faculty Supporter: Dr. Scott Lamoureux, Geography

Large scale land disturbances are occurring in sensitive Arctic regions as a result of climate change. These disturbances which are caused by permafrost melting and can damage fragile tundra ecosystems and have important impacts on downstream water quality. Determining the timeline of these disturbances will aid in the understanding of the effect of climate change in the Arctic. This can be performed through the analysis of environmental proxy records such as those found in the annual growth rings of trees, which express environmental stresses, such as those experienced during a land disturbance.

Dendrochronology of the most northern occurring woody plant, *Salix arctica* (arctic willow) has been explored only a few times in the past, and its potential for paleoenvironmental studies in the Arctic have been largely over-looked. We examined the thickness of annual growth rings from *S. arctica* from two areas of land disturbance on southern Melville Island, Nunavut. Common growth trends were found in both dead (snag) and living samples from the sites. Preliminary data show that a substantial disturbance in the growth of the samples is evident approximately 40 years ago and was likely due to land disturbance. These initial findings demonstrate the successful use of *S. arctica* as a paleoenvironmental indicator and provide useful tools to determine the timing of past permafrost disturbances and climate change in the Arctic. We are continuing to investigate additional samples from other sites to determine if the method can be used as a novel tool for understanding permafrost landscape dynamics.

8. Temperature Dependence of Carbon Dioxide, Nitrous Oxide and Methane Exchange in High Arctic Mineral Soils: Implications for Feedbacks to a Warming Climate

Presenter: Evangeline Fisher, Geography

Faculty Supporter: Dr. Neal Scott, Geography

Plant communities in the high Arctic are distributed according to moisture gradients. If moisture regimes change in response to future climate change, the distribution of plant communities is also likely to change. An understanding of how interactions between vegetation community type and changes in temperature and moisture levels will impact the flux of nitrous oxide, methane and carbon dioxide in arctic soils is critical for predicting potential positive feedback to climate warming. My research quantifies the flux of these greenhouse gases from mineral soils collected from three different plant community types at Cape Bounty, Nunavut: wet sedge, mesic heath, and polar desert. Intact soil cores (0-10 cm) were collected during July of 2008, then sealed and refrigerated for transportation back to Kingston. The cores were incubated at 4°C, 8°C, and 12°C, including a three week pre-incubation to ensure the cores were completely equilibrated to their respective temperature. My results suggest a significant temperature dependency for production of each of the greenhouse gases, with enhanced output in the characteristically wetter sites. The response to temperature (Q₁₀) does not; however, appear to be consistent across the different plant communities. Further field studies were conducted to determine the impact of these vegetative community types on observed soil temperature. My results demonstrate a tendency toward warmer temperatures and enhanced diurnal fluctuations at drier sites. These initial results suggest that in a warmer climate, high Arctic soils have the potential to contribute to a positive feedback to climate change through the efflux of these gases.

9. Creating Effective Health Promotion Messages: Using Eye Tracking Technology Coupled with Masked Recall to Determine the Effectiveness of Loss and Gain Framed Osteoporosis Advertisements

Presenter: Jordanne Dalgleish, Health Studies

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

Osteoporosis is a debilitating disease which afflicts over 25 percent of Canadian women over the age of 50, and can lead to serious fractures. (Osteoporosis Canada, 2009) What is the most startling about this disease is that osteoporosis is largely preventable by taking calcium and vitamin D supplements and enjoying a healthy, active lifestyle. The challenge then, is to figure out ways to effectively communicate prevention related health messages. By framing messages either by naming or showing the consequences (loss framed) naming or showing the benefits (gain framed) or simply stating the facts (neutral framed), message framing can be a persuasive communication tool to affect changes in behaviour (Pelletier & Sharp, 2008) Using eye tracking technology- which is a device used to measure a participant's attention to advertisements - data will be collected to monitor the number of eye fixations, and the dwell time, or total amount of time looking at a particular advertisement. This information will be used to determine what types of messages (loss, gain, or neutral framed) garner more audience attention. The eye tracking data will be coupled with an exercise after the eye tracking experiment where participants are asked to recall what was written in the health advertisement messages. This exercise will provide information on whether loss, gain or neutral framed messages were more effective for audience recollection, which is significant because the messages recalled more easily are more likely to change perceptions, attitudes and behaviours.

10. Mercury Biomagnification in the Food Web of Tropical Andean Stream

Presenter: Sae Yun Kwon, Biology

Faculty Supporter: Dr. Linda Campbell, Biology

Increasing release of mercury (Hg) through gold amalgamation, and deforestation have been major concerns in South America. Volcanic sources have also contributed to the natural emission of Hg from the Andes Mountains. Hg not only exhibits biomagnification through aquatic food webs, but it is also neurotoxic and impacts the reproductive capacity of fish. Many studies have assessed Hg biomagnification from areas of gold mining and erosion, but ours is one of the first to examine Hg contamination in a relatively undisturbed area. We used stable nitrogen ($\delta^{15}\text{N}$) and carbon ($\delta^{13}\text{C}$) isotopes to characterize the food web of Río Las Marías, Venezuela, and examine Hg biomagnification trends. Representative fish species from Río Las Marías were collected during January-February 2004, including detritivores, herbivores, invertivores, parasites, piscivores, and carnivores. Nitrogen isotope results indicate that parasitic catfish (*Ochmananthus alternus*) ($\delta^{15}\text{N} = 12.2\text{‰}$), carnivorous stingrays (*Potamotrygon orbignyi*) ($\delta^{15}\text{N} = 11.4\text{‰}$) and piscivorous redeye piranhas (*Serrasalmus rhombeus*) ($\delta^{15}\text{N} = 10.9\text{‰}$) act as top consumers in the web. Detritivorous characins (*Steindachnerina argentea*) ($\delta^{15}\text{N} = 6.8\text{‰}$), and invertivorous knifefish (*Apteronotus albifrons*) ($\delta^{15}\text{N} = 7.9\text{‰}$) were located at the bottom of the food web. Although the highest $\delta^{15}\text{N}$ value was observed from *Ochmananthus alternus* due to its unusual diet of fish mucus, we predict that piscivorous species will exhibit higher Hg concentrations by consuming the muscle tissue where Hg is stored. Our assessment of Hg patterns in Río Las Marías will clarify the extent of Hg contamination in undisturbed areas, and will offer a valuable comparison to rivers that are influenced by gold mining activities.

11. Exploring Various Factors and Sources in Relation to Environmental Contaminants in the Rideau Canal System

Presenter: Cynthia Lai, Environmental Studies

Faculty Supporters: Dr. Linda Campbell, Environmental Studies and Biology;
Dr. Graham Whitelaw, Environmental Studies;
Shannon Leblond, MSc Candidate, Biology

The Rideau Canal has served several purposes since its establishment in 1832. Acting as a channel connecting Ottawa and Kingston, it was often used for the transport of commercial goods and lumber. Over time, its uses expanded to include recreational purposes such as: sport fishing, boating, cottaging, and tourism. This increased development and use has caused the Rideau Canal and its watersheds to become vulnerable to metal contamination. Studies within Dr. Linda Campbell's Lab at Queen's University have shown that cadmium (Cd), lead (Pb), chromium (Cr), zinc (Zn), mercury (Hg), arsenic (As), and copper (Cu), are in concentrations that have reached or exceeded the level of potential concern for both aquatic and human health. This study explores the potential sources as well as both natural and human factors which could be related to the influx in metal contaminants within the system. A literature review of both historical and recent documents was completed and supplemented with personal interviews with professionals and community members. Based on these investigations, the primary sources being reviewed are: atmospheric deposition, natural geological processes, and anthropogenic factors relating to residential development. While research is still ongoing preliminary analysis suggests that these are the primary sources of contamination within the area.

12. The Role of the Human Prefrontal Cortex in the Response Suppression of Eye Movements

Presenter: Jason Lloyd Chan, Life Sciences

Faculty Supporter: Dr. Joseph DeSouza, York University

Increased activity in a population of prefrontal cortex neurons has been shown, in previous studies, to precede correct anti-saccades in primates. In addition, the time courses of two competing processes in these neurons, task selection (which prepares for an eye movement) and saccade suppression (which prepares for the suppression of an eye movement), intersect at a specific time after the presentation of a coloured instruction cue. The purpose of this study is to use eye tracking behaviour to investigate this intersection point and its role in response suppression in regard to the generation of anti-saccades in humans. Subjects were instructed before a stimulus appears, using a colour cue, to either look towards the stimulus (pro-saccade) or away from the stimulus (anti-saccade). Instruction period times varied from 100ms to 1400ms, in 50ms steps. Based on previous primate electrophysiological data, the ratio of direction errors (pro-saccades on anti-saccade trials) to correct anti-saccades was expected to increase around 400ms to 500ms, when the processes of task selection and saccade suppression diverge. A slight ratio increase was found and full results are forthcoming.

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