



**BRANDON  
UNIVERSITY**

# It's All Happening at BU

RESEARCH CONNECTION

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# It's All Happening at BU!

Research is a broad term that encompasses not only scientific study but also a variety of qualitative approaches and creative activity. The research, scholarship, and creative activities of our faculty members and our students, supported by increased external research funding, continue to provide discoveries, knowledge, cultural understanding and creative artworks, all of which benefit our students and society as a whole. Our aim is to disseminate our research beyond the campus to the broader community. Research Connection is published regularly throughout the academic year and aims to present faculty research in an easy-to-read format. Since its inception in November 2016, it has featured over 50 BU researchers and several graduate students.

As you read, you will discover that research at BU is thriving and explores wide-ranging topics from brain tumours to mapping the galaxy, shelterbelts to Shakespeare and music therapy, to keeping toads safe on the road, and much, much more. The University's success in leveraging its capacity to form partnerships across the country and internationally demonstrates that a small university can play a significant role in research on the national stage. In 2017-18, BU researchers received more than \$3.2 million from external agencies, including CIHR, NSERC, SSHRC, CFI, Canada Research Chairs, Government of Canada and the Province of Manitoba, as well as industry. But it's not only faculty who are engaged in research. Students here also are deeply immersed in research. Both undergraduate and graduate students also received a number of awards this past year.

The research, scholarship, and creative activities of our faculty members and our students, supported by increased external research funding, continue to provide discoveries, knowledge, cultural understanding and creative art works, all of which benefit our students and society as a whole. BU's growing research reputation enhances our ability to attract and retain outstanding faculty members and students within the province.



## *Research and Creative Projects Make a Difference*

If I asked you to think about a university — any university, not just Brandon University — what would you think of? No matter what image jumps to your mind, students are likely in the front and centre of it. That is deservedly so! One of the central functions of every university is to share and transmit knowledge, and one of the key ways we do that is through our wide variety of teaching and learning activities.

Behind this picture is another central function of a university: the research and creative activities of our faculty members. These activities will certainly benefit Brandon University students. At the same time, our faculty members also want to add knowledge by asking and answering questions that will make a difference in the world – to remember and learn from history, promote the arts, build relationships and understanding with our First Nations, Metis and Inuit People, explore the universe, support the environment and support individuals and communities.

Across Brandon University our faculty share this common desire to do something meaningful through research or creative activities. This requires us to gather evidence or engage in artistic projects that go beyond our personal knowledge, experience and beliefs. It also requires that we share our knowledge and creativity with others including our students.

Brandon University also brings specific strengths to the research that happens here. Our compact size means that faculty members and students can more easily connect with people outside of their area of specialization. This leads to opportunities for cross-pollination and

inter-disciplinary insight. Our graduate programming means that students have opportunities to participate in research with faculty. And our close connection with our community means we are nimble and responsive in doing research that is rooted in the southwestern Manitoba experience.

The publication you are reading celebrates the results of recent research and creative activities at BU. It is a collected edition of our Research Connection periodical, which shares BU's research with our neighbours and the wider community on an ongoing basis. It does this by translating and abbreviating voluminous results into a briefer format. Each edition concludes with a description of how the research can be used to make a difference.

Much of the research featured herein is ongoing, and Research Connection will continue to update its results. Even when a particular project is concluded, the matter is seldom settled. New questions always arise, and researchers tend to follow the threads leading from past research to new problems that need to be solved. Research Connection will continue to feature those new pursuits as well.

Thanks to this research, we will all keep learning, as well as sharing our knowledge and creativity.

**DR. STEVE ROBINSON**

Interim President, Brandon University





## *Research Success at Brandon University*

“Research is to see what everybody else has seen, and to think what nobody else has thought.”

— Albert Szent-Gyorgyi

It is an exciting time at Brandon University. There is a whole lot of research going on here and it may be the best kept secret outside the confines of the University! The aims of this 50th anniversary compilation of Research Connection are to celebrate the accomplishments of our leading scholars, scientists, artists, and students, and to highlight to the broader community the research and creative works that are happening in the Faculties of Arts, Education, Health Studies, and Science, and the School of Music at Brandon University.

Research plays a huge part in our daily life. It is an exploration, a means to increase our knowledge of science, of society, of culture, and the arts. Part of the job of a university faculty member is to participate in research or creativity. This can mean publishing journal articles, writing books, creating plays, composing music, exhibiting art, and many more like activities. Our skilled and talented faculty members excel in these areas. We currently have three Canada Research Chairs, in Rural and Remote Mental Health, Quantum Information Theory, and Queer Theory, and are just starting a search for a fourth. Our faculty members collaborate and partner with peers nationally and internationally.

Not only does research increase our knowledge and enhance our lives, but it also benefits our students. It informs our teaching as faculty members and involves many of our students, both graduate and undergraduate.

Our smaller size is beneficial in that many senior undergraduate students work with faculty on research, opportunities that in larger institutions are reserved for graduate students. By participating in research, students gain critical thinking, problem-solving, analytical, and importantly, leadership skills that are invaluable in their future careers.

It is stimulating to be a part of Brandon University as it continues to impact the lives of its students, the city, and the community. We are continuously increasing the quality of our research by obtaining funding from various competitive federal and provincial programs. Underpinning the success of research at Brandon is the excellent support from the Office of Research Services. Many thanks to Kerry Murkin (Research Manager) and Shannon Downey (Research Ethics Officer) for the tremendous work they do, and to Christiane Ramsay, who edits Research Connection, Dr. Karen Rempel from the Centre for Aboriginal, Rural and Education Studies, and Grant Hamilton and Rob Henderson, our Communications team, for their work on this 50th anniversary publication.

**DR. HEATHER DUNCAN**

Associate Vice-President Research, Brandon University

## Improving Rural Dementia Care

DR. RACHEL HERRON

Voluntary organizations play an important role in supporting people with dementia and their partners in care. However, resources vary across different rural communities and over the course of the condition. Overall, one of the most underdeveloped areas of support is meaningful support for people in the early stages of dementia.

In Canada, over 500,000 people live with some form of dementia. Dementia refers to a range of complex progressive degenerative conditions, such as Alzheimer's disease and vascular dementia, which affect a person's memory, language, judgement, and attention. People with dementia and their partners in care experience different needs depending on the severity of the condition; however, in many places, people with dementia and their partners in care do not experience the quality and kind of support they need. This study focused on rural and small-town Ontario because rural people, in Canada and internationally, typically face additional challenges getting appropriate health and social care.

In general, the study found that support services for people with early-stage dementia were underdeveloped in many of the chapters outside of major urban centres. Rural service users typically took advantage of fewer in-office services. However, they consumed more time and resources in transportation and more one-on-one home visits than their urban counterparts. People with dementia in the study delayed seeking formal support because they did not feel they were "there yet." They suggested that the services available did not reflect their interests or abilities. They expressed a strong desire to continue to contribute to their communities, homes, and surrounding environments. On the other hand, partners in care were more likely to initiate and encourage service use than people with dementia. Partners in care explained a number of ways in which they were constrained by the lack of available support in the home and community settings. Lack of early stage support and consistent services places increasing demands and constraints on partners in care.

Ultimately, the key findings from the study identify the challenges and potential of caring for people with dementia in rural and small-town settings. Work remains to improve the accessibility and acceptability of care across rural and small-town settings and over the course of the illness. Many successful programs exist but they need to reach rural people and respond to their interests and capacities. Dr. Herron's ongoing research in Manitoba draws on the gaps identified from this broader research project to focus on innovative program solutions and the needs of isolated partners in care.

## Get Fit Quickly. Can Creatine Help?

DR. SCOTT FORBES

How can I get fit quickly? The answer is high-intensity interval training, or HIIT. This very intense and time efficient exercise training is known to improve aerobic fitness, performance, body composition, and may improve metabolic health. Can we can further enhance HIIT with a nutritional supplement, like creatine? With resistance training, creatine leads to greater gains in muscle mass and strength and, in theory, creatine should allow people to train harder.

We used a randomized placebo-controlled, double-blind, experimental design. Seventeen young women were randomly assigned to either the creatine group or a placebo group. Both groups did HIIT three times a week for four weeks. Before and after the experiment, each participant completed exercise tests and a body composition scan. HIIT, as expected, improved aerobic fitness and time-trial performance; however, there were no differences between creatine and placebo groups.

This confirms that HIIT is an effective and time-efficient exercise strategy, but creatine added no further benefit. It may be that HIIT is so potent and effective, while creatine supplementation has such a small effect.

## What Are RPNs Doing These Days?

JAN MARIE GRAHAM, KATHERINE PACHOWSKI, AND CANDICE WADDELL

This research identified the skills, tasks, and activities routinely expected of RPNs in a variety of workplaces and explored their sense of professional identity. Approximately 1000 Registered Psychiatric Nurses (RPNs) care for Manitobans living with mental health issues or psychiatric disorders in an array of settings that require a variety of specific skills. Using a survey and focus groups, this research identified the skills, tasks, and activities routinely expected of RPNs and explored their sense of professional identity.

Respondents were asked the open-ended question "In your opinion, what unique contributions are made by RPNs to health care teams?" Specialized knowledge was the primary theme that emerged and was related to wellness strategies, a holistic approach to care, building therapeutic relationships, supporting recovery, and advocacy. Rarely were they asked to perform tasks that required skills outside their specialisation such as intravenous insertion and management of feeding tubes. The majority of respondents felt valued and recognized for their expertise and supported in by their health care team.

# Masculinities in Hockey Players



DR. TIM SKUCE  
Assistant Professor, Curriculum and Pedagogy

**Ice hockey is deeply embedded in Canadian culture, having evolved from recreation to a way of life.**

The Central Hockey League (CHL) and the National Hockey League (NHL) have emerged as important sites for the production, negotiation, and maintenance of masculine ideals in Canadian culture. Canadian hockey masculinity often accentuates extremely physical and aggressive play.

Although many young boys and men who participate in competitive ice hockey engage in overly aggressive play, most males are not comfortable committing such acts.

The socialization process becomes problematic when young men strive to embody certain traits of being a man. In particular, participants in elite-level ice hockey are often intolerant of homosexuality and fear being perceived or framed as feminine. These traits, which are referred to as toxic, are frequently perpetuated and legitimized in a variety of social contexts that extend beyond the confines of hockey. Many observers express the importance of challenging practices that legitimize extremely aggressive play and men's dominant position in society that justifies the subordination of women, and other marginalized

**Canadian hockey masculinity often accentuates extremely physical and aggressive play.**

understandings of being a man. During the past two years, Dr. Skuce has focused his research on the concept of masculine identity within the context of elite-level ice hockey players. Through interviews with current players from the CHL as well as former and current NHL players, this study explored how athletes' notions of what it is to be and to become a man (in relation to their coaches, other players, and the greater hockey community) are influenced by their participation in elite-level hockey contexts.

Findings highlight how the concept of masculinity is interpreted and performed by these athletes and how these

interpretations(s) influence the formation of their identity. Despite the fact that many traits of hegemonic masculinity remain prominent in the CHL and NHL, hegemonic masculinity is neither fixed nor stable, but is fluid and ever-changing. Elite-level hockey players are challenging

the predominance of hyper-masculine behaviours as well as fears of being perceived as homosexual and/or effeminate in their sport and embracing and enacting a more inclusive masculinity, one that does not support acts of on-ice violence. Further, the notion of masculinity is not a fixed or stable construct; rather it can be re-interpreted to provide other alternatives of what it means to be an elite-level ice hockey player both on and off the ice.

## You Can't See Through the White

DR. DEREK BROWN, BEN DAVIS AND ERIC PLATZ

You Can't See Through White (YCSTW) brings together a visual artist, a philosopher of perception, and a percussionist/composer to create multi-media works and performances. Informed by theory from the philosophy and cognitive sciences of perception, their works explore relationships between natural and altered landscapes, composition and improvisation, and visual and sonic perception.

Like artistic work in general, the works produced by YCSTW seek to push the boundaries of human understanding and transform the audience's perception of experience in unprecedented ways. What is distinctive is the inspiration: artistic insight and aesthetics in conjunction with scientific results and philosophical reflection.

YCSTW's recent work builds on point-of-view video footage and ambient audio sampling from Canadian winter environments. Video samples are projected onto differing surfaces, superimposed on text, and edited to highlight the inherent biases of representational technology. Ambient, studio-generated and verbal audio samples are resequenced, incrementally developing a multi-layered soundscape. The audio and visual components are in continual dialogue, generating immersive works that induce evocative multi-modal experiences. The result challenges the innocence of representational technology, has implications for contemporary perceptual theory, and confronts the fragility of our perceptual lives.

## Atlas of Sound

DR. LEANNE ZACHARIAS

One of Heritage Canada's signature Canada150 projects was a series of multidisciplinary art projects inspired by nature, in connection with Canada's National Parks and Dr. Zacharias was invited to create a new sound piece to accompany the work of Michael Belmore. His piece, Coalescence, is a sculpture in four parts that spans thousands of miles between Saskatchewan and Manitoba, tracing the historical path of the glacier that once covered much of North America and linked the Prince of Wales National Historic Site (Churchill), The Forks National Historic Site (Winnipeg) Riding Mountain National Park and Grasslands National Park. The researcher's task was to link the unique environments and sonic characteristics of the four geographical areas by interpreting and translating environmental data into a new musical score. The resulting

composition, *Sounding the Wake of a Glacier*, functions as an atlas of sound, bringing these four sonic environments together through field recordings, transcription of animal calls and musical interpretation of climatic and hydrological maps of the four regions.

Including map study and re-interpretation added new, rich elements to explore through sound and score creation. The research also revealed surprising similarities between seemingly contrasting sonic environments through analysis of the field recordings: it turns out that the coyotes of Grasslands National Park and the belugas of the Churchill River Estuary sing remarkably similar songs, sharing a very close high-frequency range.

## César Franck's Early Works

DR. JON-TOMAS GODIN

César Franck's position in the history of music is unusual, perhaps even unique. Many of his pieces from the last decade of his life are standard repertoire for pianists and violinists in particular. He is recognized as a seminal figure in French music at the turn of the 20th century. However, Franck's music and influence are relatively underrepresented in North American scholarship on music, possibly because his early life and training span multiple national traditions.

This project focuses on the composer's musical education and early works, teasing out threads of influence from French and German national styles. Many of Franck's earliest compositions are variations on popular tunes, which allow for comparing

variation techniques. More interesting are the harmonic and formal characteristics of these early works. In all, they are essentially neutral; they don't display any characteristics that can be ascribed to a distinctive national style, or to Franck's own individual style as apparent in his later works.

This leads to two possible conclusions: (1) that Franck's journey toward a personal style was unusually long for a composer whose works hold an important place in the repertoire; and (2) that the link between a composer's roots and national identity needs to be re-examined, at least in this case. More work needs to be done to verify each of these conclusions.



# Shakespeare and Music Therapy



DR. DEANNA SMID  
Assistant Professor, English  
and Creative Writing

Renaissance physicians and writers understood something that is only now becoming acknowledged by Western medicine: music has power over the human body and power to heal.

This study is a close, literary analysis of Shakespeare's plays in the historical context of sixteenth- and seventeenth-century documents on music and health. The data were collected from primary texts (treatises, broadside ballads, notebooks, records of performance) at the William Andrews Clark Memorial Library in Los Angeles, at the Folger Shakespeare Library in Washington, DC, and in the Stirling Maxwell Collection at the University of Glasgow.

The research sheds light on original performance practices of Shakespeare's plays, and theorizes the curative nature of music and drama. "Music, Awake her, strike!" calls Paulina in

Shakespeare's *The Winter's Tale*. With those words, and with the sound of music, the statue of Hermione returns to life in front of the astonished eyes of her husband and daughter. The scene is extraordinary to be sure, but it finds noteworthy resonances in other plays: in *Pericles*, the main character is restored to sanity by a song, and his wife is brought back from the brink of death by music. And what instrument does the physician in *King Lear* need to cure the king of his melancholy and mania? Music.

Of course, music is not always so effective, for it is often the purview of fools (such as Feste in *Twelfth Night*) and madwomen (such as Ophelia in *Hamlet*). Yet, music is always powerful and influential over the body. In his plays—particularly his 'late' plays: *The Winter's Tale*, *Cymbeline*, *Pericles*, and *The Tempest*—Shakespeare uses theories of music's effects to highlight the curative nature of music and the theatre itself—to heal, to mend, and to restore. This research was funded by the Social Science

and Humanities Research Council of Canada, and by the Center for 17th- and 18th-Century Studies at University of California Los Angeles.

Music is always powerful and influential over the body ...  
Shakespeare highlights the curative nature of music and the theatre itself.

# Decolonizing Approaches to Inuit Community Wellness



CANDICE WADDELL  
Assistant Professor Faculty of Health Studies





Nunavut communities struggle with a variety of challenges related to social distress, which are evidenced by elevated rates of suicides among youth, childhood sexual abuse, domestic violence, mental health problems, and addiction. These struggles represent a rupture with traditional Inuit society; many of these issues are a direct result of processes of colonization, particularly settlement into communities in the mid-1950s, and ongoing social inequity.

Colonization and rapid modernization have had a profound effect on Inuit community wellness. Inuit knowledge, and fostering a sense of hope in resilience through community discussions and activities, shifts the focus of healing in Inuit communities from oppression to empowerment.

To explore the impact of these processes of colonization, this community-based participatory research project elicits traditional knowledge related to community wellness from ten Elders living in Cape Dorset, Nunavut. Results resonate with other community wellness research projects in Nunavut that recommend community-based solutions focused on resilience and strength. This project expands on these findings by eliciting concrete solutions that communities can utilize to improve community wellness. The research was presented to the community to help influence community wellness practices. The information gathered from this study may be used by other communities and by service providers to ensure that they are respecting community processes and using strategies that limit the impact of colonization.

This community-based participatory research was conducted in conjunction with a Community-Based Research Advisory Committee in Cape Dorset. Research was possible because of the knowledge sharing and collaboration of the community of Cape Dorset, and all Nunavummiut who continue to share their stories openly and honestly. The Northern Scientific Training Project provided partial funding for this research.

## Colonization and rapid modernization have had a profound effect on Inuit community wellness.

### The main concepts identified by the Elders

*Respect* – Rapid modernization and relocation have caused a disconnect between the traditional and contemporary roles of the Elders. This disconnect is causing Elders to feel less respected and as if they have ‘less of a voice’ with the community youth.

*Leadership* – The influx of Qallunaat (outsiders) and the establishment of numerous government departments affected leadership and the power balances within communities.

*Family Connection* – Population size, historical trauma and larger networks of influences have impacted families.

*The Inclusion of Traditional Knowledge* – Elders within communities are critical to ensuring that important aspects of Inuit knowledge and Inuit identity are passed to the younger generation.

*Working Together* – There is a current need for outside resources to work in collaboration with community members and Elders.

*Resiliency* – Resilience is seen in the maintenance of traditional Inuit language and ongoing teaching of traditional activities like hunting and carving.



## Community Gardening for Social Resilience

DR. SERENA PETRELLA  
AND SUYOKO TSUKAMOTO

Community Gardens help fight food insecurity in times of economic precariousness and retraction of social supports. Community gardening is a family affair, bonding generations to one another, and a collective strategy for community building and integration. Community gardens boost physical health and mental well-being, neighborhood renewal and safety, while also encouraging “ecological citizenship” and sustainable food production.

Researchers surveyed gardeners in 15 community gardens in Brandon. We found community gardening boosts food security: most gardeners reported that they wished to bring affordable fresh produce to their table; about half stated it helped subsidize the family budget. We found that community gardening fights social marginalization — it cultivates resilience through collective work, alleviates dependency, and fosters self-determination in economically precarious times. Gardens are communal spaces shared by people of all ages, who are culturally and ethnically diverse; long time members of the community and newcomers are able to socialize with one another. Gardeners are socially and environmentally mindful: gardening gives them the occasion to engage with their community and celebrate their cultural identity by using growing techniques from home. Spontaneous forms of monitoring and supervision arise, which can help mitigate crime, and are particularly beneficial to youth in low-income environments. Gardening helps to forge stronger family bonds, where family members collaborate.

This research shows the important social and health benefits of community gardening, proving it is a worthwhile and essential activity for Brandon citizens. These data will help city planners, community developers and activists to develop strategies that continue to foster community gardens’ social justice dimensions, and guide the introduction of new programs for the alleviation of food insecurity. Data have also been shared with Brandon University’s Geography Department which prepared GIS maps to measure distance travelled to reach the community garden. These maps will help to identify areas that are devoid of public garden space and where land should be allocated.

## Global LGBT Rights

DR. CORINNE MASON

According to the United Nations, the human rights of lesbian, gay, bisexual, transgender, intersex, and queer individuals are being violated around the world. These people are attacked, kidnapped, raped, and murdered based on their real or perceived sexuality, gender identity and expression. The global development and human rights industry is now, rightly, focused on global LGBT rights, and has shifted from a concern with primarily gender to incorporating analyses of sexual orientation, gender, identity and expression, into policy and programming. Dr. Mason’s study maps this new focus and brings feminist critiques of gender mainstreaming into the same theoretical arena as unfolding and critical dialogues about these analyses.

The project includes four case studies, paying specific attention to their respective roles as agenda-setters, knowledge-makers, international donors, and foreign policy-makers: United Nations, World Bank, Human Rights Campaign, and the United States Agency for International Development.

This project will be of interest to development practitioners and policy makers in the areas of international development, human rights, and foreign aid. An outcome of this work will be the communication of the results in multi-stakeholder spaces, specifically among development organizations and practitioners. Dr. Mason’s analysis of policy and programming related to sexual orientation, gender, identity and expression will have implications for how workers approach global LGBT rights. Since this project will focus on questions of ‘mainstreaming’ strategies in the work of development organizations, this research will build critical knowledge in policy-making circles. In addition to communicating the research results to the development industry, the questions of global homophobia and transphobia that anchor the research will be particularly interesting to the general public, especially since global gay marriage, the criminalization of same-sex relations, and worldwide mappings of ‘pride’ and ‘prejudice’ are popular media topics. Dr. Mason’s findings will also be presented at national and international conferences. Two peer-reviewed articles and one manuscript from this project will be published.





How has the story of Louis Riel been shaped by musical works that take Riel as subject?

# Alternate Riel-ités



DR. COLETTE SIMONOT-MAIELLO

Assistant Professor, Music

## Music plays a role in both reflecting and creating our histories.

Five decades ago, in 1967, Canada's 100<sup>th</sup> anniversary was marked by a flurry of musical commissions, the most prominent of which was the opera *Louis Riel*, commissioned for the Canadian Opera Company in Toronto, with a text by Mavor Moore and Jacques Languirand and music by Harry Somers. Creators and critics alike commented that the opera represented a multiplicity of Canadian identities, encompassing French and English, Aboriginal and non-Aboriginal, and West and East. In 2017, the Canadian Opera Company mounted a revival of Somers' opera to mark Canada's sesquicentennial. This opera was created without input from the Métis community and so its revival for a Canadian anniversary has been controversial.

This research takes a critical look at Somers' 1967 opera and its revival in 2017, posing several questions: How has the story of Louis Riel been shaped by musical works that take Riel as subject, including Somers' opera? How can the meaning of a musical work shift depending on when and where it is performed? How can opera directors and performers creatively re-interpret works to tell different stories? Can we find value in historical works by putting them in a discursive relationship with works that tell alternate stories?

To explore these varied questions, Dr. Simonot-Maiello consulted a variety of literature, correspondence, and scores and recordings of music focusing on Riel. While a majority of the works are folk songs that represent Riel as a hero, her first case study concerns two pieces outside this model—Somers' 1967 opera and a 2013 oratorio titled *Empire Étrange* by Cree composer Andrew Balfour.

The first case study has been fruitful. Both Somers' and Balfour's works give a prominent place to Riel's prophetic vision, the part of Riel's story most open to a variety of interpretations. However, two very different constructions of Riel's identity have emerged, one as a Catholic religious fanatic who may have been mentally ill and another, as an Aboriginal man beleaguered by a trickster spirit.

Interpretations are never apolitical. A reading of the opera's vision as a symptom of mental illness suggests recolonization, as Riel's detractors could have used psychiatric disenfranchisement as a colonizing strategy. On the other hand, an interpretation of the vision that attends to aspects of Aboriginal spirituality allows the work to participate in decolonization.

## Fossil Plants and Global Warming

ALEX LOWE AND  
DR. DAVID GREENWOOD

Current global climate change is expected to have drastic impacts on plant communities, but the long-term effects are difficult to predict. Palaeobotanists look to the fossil record for modern analogs — evidence from past warming events. Fifty-three million years ago global temperatures rapidly rose so high that the poles were ice-free and alligators swam in Arctic swamps. This study looks at the McAbee Fossil Beds in British Columbia, which preserve plants that lived during this time. This record spans about 100,000 years and provides us with the opportunity to study long-term responses of local climate and plant communities to global warming.

The first step was to collect fossils during expeditions to McAbee. The joys of field work at McAbee involved splitting open blocks of shale, opening them much like pages in a book, revealing fossilized leaves, flowers, and seeds, on a beautiful (and sometimes very hot) hillside. Separate fossil collections were made from layers of rock, each representing a snapshot in time. Once identified in the lab, the plant types of each layer were studied. The sizes, shapes, and margin types (i.e., toothed versus smooth) of leaves were also studied, as plants adapt to particular climates by employing various leaf traits that are similar even in unrelated plant species.

Studies like these will serve as useful perspectives when making informed decisions regarding policy on current climate change.

## Microbe Biomass and Soil Health

DR. TERENCE MCGONIGLE,  
WILL TURNER, AND KAYLIN LIDDLE

Farmers strive to maintain agricultural land in good condition while at the same time producing the food we buy at the grocery store. Soil health is typically measured in terms of production, such as the growth of forage plants or the weight gains of grazing animals. However, the industry seeks a measurement that can be made on the soil directly, in order to determine health and predict productivity.

The growth of plants depends on the activities of microbes in the soil. Some microbes break down organic matter to release minerals that the plants need, whereas other microbes assist roots to collect those minerals. This research takes an important step forward by evaluating soil microbe biomass as a possible indicator of soil health. Data collected from previously published studies from North America, Europe and elsewhere, were combined in a new analysis and plotted on graphs.

As previously reported for croplands, microbe biomass increased in response to increasing organic matter in the soil. The novel result of this analysis was that more microbe biomass was shown to be present per unit of organic matter in the grassland soils of greater soil health, thereby supporting the use of microbe biomass as an indicator. The robust nature of this relationship, as found across the world, encourages the use of microbe biomass for assessment of soil health widely across many locations.

## Using Computers to Solve Earth's Energy Problems

DR. ERIC BUSHNELL AND BRIANA BOYCHUCK

Increasing levels of greenhouse gases in our atmosphere threaten our planet as a result of climate change. A main component of greenhouse gases is carbon dioxide, a primary product of the fossil-fuel consumption used to meet the planet's energy demands. Based on current emission levels of carbon dioxide into our atmosphere, the probability of reaching a threatening 2° C temperature increase by 2100 is 88 per cent! To prevent this requires urgent action to reduce fossil fuel consumption and develop renewable energy sources.

The most viable path for large-scale growth of alternative energy sources involves solar energy splitting water to form molecular hydrogen to be used as an alternative fuel. While hydrogen is the most abundant element in the universe, elemental hydrogen is not present on earth in significant amounts and must be

produced from a hydrogen-containing source, such as water. Electrolysis of water allows for the conversion of electricity into chemical energy. However, low cost and efficient methods of hydrogen fuel production are limited at present.

A computational chemistry tool was used in the research lab to solve complicated equations of quantum mechanics, allowing chemical reactions to be studied at the atomic level. Present results from the research program are promising and suggest that nickel-diselenolene catalyzes the formation of hydrogen gas with a small energetic cost. Knowledge gained from this work and ongoing work will provide insight into the design of new catalysts for the renewable production of hydrogen via the photocatalytic splitting of water.



# The Perceptual World of Horses



DR. TAMMY MCKENZIE  
Assistant Professor, Psychology

Each species of animal has its own unique perceptual world based on the structure and capacity of their various sensory modalities.

How humans perceive the environment may vary greatly from non-human animal species, which can lead to misunderstandings of particular behaviours in nonhuman animal species. Humans have had a long history of interactions with horses, including using them as working animals, for recreational purposes, and as companion animals. Many accidents occur to humans and to horses every year because of their interaction with one another. The more we comprehend the perceptual world of horses, the greater understanding we have of the reasons for certain behaviours and the greater the insights we have into best handling and training practices.

Dr. McKenzie's research program focuses on learning, perception, numerical processing, and memory in horses. In the past, she has worked with a wide range of species including rats, hamsters, squirrel monkeys, pigeons, and songbirds. Her current project aims to further humans' understanding of how horses process visual information about objects in their environment, focusing on three areas, how horses: (a) recognize objects; (b) perceive

moving objects, and (c) perceive and react to a variety of human facial expressions.

When examining horses' perception of moving objects the horses are presented with two identical rotating objects moving at different speeds or in different directions. The horse is reinforced for selecting the object that is always moving one particular speed or direction (the correct response for each horse is determined prior to the start of the experiment). The horses' rate of learning to discriminate between the two objects is measured. A similar procedure is used to examine horses' ability to learn to discriminate between different types of objects. To explore horses' responses to human facial expressions involves measuring changes in horses' heartbeat when presented with different human facial expressions in photographic format. Behavioural changes such as approach or withdrawal from the photograph are also recorded.

The more knowledge that humans have about how horses perceive visual stimuli the more informed decisions we can make regarding how we interact with horses. Better

informed decisions may lead to improved welfare for both the horse and rider/handler. This type of research is becoming of increasing interest as horse owners and trainers are starting to integrate traditional training techniques with information gained through the scientific investigation of the cognitive abilities of horses.

The more we comprehend the perceptual world of horses, the greater understanding we have of the reasons for certain behaviours and the greater the insights we have into best handling and training practices.

# Stabilizing Unpaved Roads



**DR. HAMID MUMIN**  
Professor, Geology

**RILEY CRAM, BLAKE TINKESS, GREG GABOURY, BRADEN WATTS**  
Research assistants

If you live near or use gravel roads, then you know the problem! These roads comprise weakly bound to unbound aggregate.

They generate choking and noxious dust clouds when dry, and quickly lose strength and degrade to mucky conditions when wet. Throughout much of northern and rural Canada, roads are constructed of unpaved aggregate. They are expensive to maintain, environmentally problematic and degrade rapidly.

Current mitigation relies on constant and expensive maintenance, and the local application of chloride salts, with only temporary results. Consequently, there is a critical need for low-cost and environmentally sustainable construction techniques for the stabilization of unpaved roads throughout rural and northern Manitoba and across Canada.

Dr. Mumin and his team quickly discovered how little information is available to help solve the problem, and that standard geotechnical engineering tests and solutions cannot be applied to much of our research and testing. Consequently, they had to develop their own methods and standards. The team is developing a solution by using local clay-rich materials.

With the addition of catalysts and polymeric agents, the natural properties of clays are manipulated, causing them to act like a cementing agent.

With the addition of catalysts and polymeric agents, they are manipulating the natural properties of clays, and causing them to act like a cementing agent. This produces a durable, low-cost road that requires minimal maintenance, and eliminates the detrimental aspects of current construction practice. Cypher Environmental has been applying this technique to mine haul-road construction elsewhere in the world, using non-engineered in situ materials on a near random basis with considerable success.

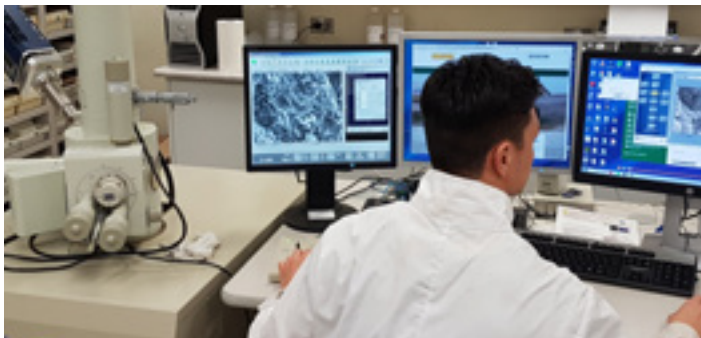
Dr. Mumin and his team are adapting the process for use on rural and municipal roads in Canada, and for the first time, have had the opportunity to engineer the materials and process from start to finish in order to maximize road strength and durability. Part of the research is carried out in the laboratory, and part is field-testing. The researchers test the binding and bearing strength of local materials comprised of varying clay-aggregate mixes, with varying catalyst

and polymer applications, compaction energies, curing times and moisture content. They also test for maximum resistance to moisture reabsorption. Field-testing includes a series of roads built near Brandon using parameters determined by the lab work. Results indicate that strength and durability are highly





variable, depending on variations in the materials that are used, differences in catalysts and polymer addition, construction techniques, compaction, moisture, and curing. Importantly, however, the team has also discovered that excellent roads can be built in the Brandon area, in particular for heavy use traffic areas, using local clay-rich materials with specific design parameters.



Check out the one-mile test section of Curries Landing road, built in 2015 with this technology, that is used by approximately 150 loaded gravel trucks daily. These roads are monitored for strength, durability, drivability and dust production. Maintenance has been reduced from three times daily maintenance to once yearly, with the cost of construction within the pre-existing budget for normal reconstruction. All

their research is carried out in close collaboration with Cypher Environmental of Winnipeg, the RM of Cornwallis Public Works, the City of Brandon Engineering Department, and local contractors.

This research can be applied to low-cost construction of durable and sustainable unpaved roads across the country and indeed worldwide. Already, industry and government delegations have come from China, Honduras, India, Alberta and Manitoba to examine the four test roads currently in use around Brandon. With the proper design and construction, there is almost limitless opportunity to solve some of the worst chronic road problems in a sustainable and very cost effective manner.

Principal funding and technical support for this research project come from Cypher Environmental of Winnipeg and a National Research Council-Industrial Research Assistance Program grant. In addition, RM of Cornwallis, City of Brandon Engineering, Bluestar Construction, Tri-Wave Construction and MIT provided generous and abundant support of this project. Support for research assistants, Riley Cram and Blake Tinkess, was provided by a MITACS Accelerate grant, and an NSERC IUSRA grant, respectively.

# Exploitation and Mental Illness in Isolated Communities

KATHERINE PACHKOWSKI

Persons living with mental illness are more likely than the general population to be victims of criminal activity and abuse. They are frequently stigmatized, alienated from family, and some members of society respond to them with fear and misunderstanding. Additionally, in rural, remote and isolated areas persons with mental illness face challenges in accessing health care, legal assistance, and advocacy resources. This exploratory study explored the nature and prevalence of exploitation, the challenges unique to rural settings, the effect of isolation from services on these experiences, and to identify suggestions for improvement.

Exploitation of people with mental illness was found to be highly prevalent in rural and remote areas: the more geographically or

socially isolated and the more visible the mental illness is, the more likely a person will be 'targeted' for exploitation by others. Exploitation ranges from financial and sexual exploitation to exploitation of people for their services or property. Social engagement, transportation, and relationships are impacting factors. The 'exploiters' can be family members, community members, service providers, or even other people living with mental illness. Mental health care systems are failing to provide resources needed to support adequate human rights of people with mental illness outside of urban areas. Ethical resource distribution requires more than simply increasing funding to existing services; rather, it requires a fundamental reimagining of how resources are distributed and controlled in non-urban regions.

# Commercializing Food Development Innovation in Manitoba

DR. BILL ASHTON, DR. GILLIAN RICHARDS AND STEPHAN WARRENER

This research examines the food processing sector and builds on previous research efforts by the Rural Development Institute at Brandon University to better understand innovation. From an in-depth examination of five different food innovations in Manitoba, the innovators took unique paths to translate ideas into sales.

In the food processing sector, innovation is essential for maintaining competitiveness with lower costs and perceived uniqueness in the rapidly globalizing world. The challenge is commercialization: there are not enough new ideas being brought to market. Adding new knowledge to our understanding of the nature of innovation in the food processing sector adds

depth to the discourse and insight to support and accelerate the commercialization of innovation.

The findings in this research raised four major points. First, commercialization is typically viewed linearly, with activities from idea to sales happening in sequence, commercialization activities like market research, planning, and financing occurred all at the same time. Second, business and food processing supports were essential in moving from prototype to production. Third, leadership was fundamental and essential. Lastly, while innovation was evident in each of the five case studies, there was no explicit mention of businesses intentionally fostering a culture of innovation.

# Northern Resource Heritage

DR. HAMID MUMIN

Volcanoes are magnificent natural wonders to observe safely from a distance. Inside, enormous volumes of hot magmatic fluids and gases leave behind an abundance of valuable metals in different types of deposits. With the right knowledge and expertise, we can find and extract the resources from ancient and now dormant volcanoes.

We have launched numerous expeditions to the Canadian sub-arctic during the summer months. We mapped and delineated the geology, and recorded the evidence of tectonic movements, migration of magmatic fluids and gases, mineralogical changes, and other evidence that may help locate hidden resources. We brought enormous amounts of geological survey data, photographs, measurements, and rock samples back to Brandon University. At Brandon, numerous petrographic, mineralogical,

and geo-chemical analyses were carried out, along with satellite and aerial imagery and geophysical surveys.

We were able to reconstruct the tectonic and geological history of these ancient volcanoes. These volcanoes are now partially eroded away, leaving exposed at surface their interior workings. Imagine being able to see into Mount St. Helens! We have the best surface exposures of the interior workings of volcanoes anywhere in the world, and all available for study! Our research has found that these ancient magmas emitted enormous amounts of metal-bearing fluids and gases that caused extensive recrystallization of the volcanic materials to many strange rock types, and most significantly, they left behind an abundance of valuable metals in iron-oxide copper-gold deposits.

# Cultural Identity and the Jazz Idiom



MICHAEL CAIN  
Associate Professor, Music

The slave trade transported countless millions of Africans throughout North and South America and the Caribbean, and along with those peoples came a rich fabric of culture.

The conditions of slavery, however, prevented the overt and direct acknowledgement of those cultures by the dominant society. Consequently, the mythologies, art, and traditions of the transplanted peoples were forced into underground, coded, and hidden forms.

Throughout history, the vast majority of African American Jazz musicians, including Duke Ellington and Miles Davis, hated the term Jazz and were very aware that the term was being used to specifically separate it from the idea of African-American music. This appropriation continues to this day. For Cain, a large part of this research involves his continued work as a Jazz performer, composer, and member of professional music communities in New York, Los Angeles, and Las Vegas. His research is aimed at reconnecting the various branches of Jazz, modern and popular music with their larger historical African roots, to provide greater understanding of how these traditions have moved from their African origins and spread throughout the African diaspora.

**The Eurocentric idea of the separation of arts means that Jazz or African American music will never be fully understood in its larger sense.**

One significant recurring theme involves the almost universal African understanding of the inextricable inter-relationships among dance, singing, and music, in that they are not separated and discrete things. University Jazz programs focus on the music exclusively, and not on its relationship to the dance and singing that accompanied and defined the music. The Eurocentric idea of the separation of arts means that Jazz or African American music will never be fully understood in its larger sense. Hip Hop may arguably be the closest to the purest form of African American music right now due to the

rhythmic languages and associated dances which flow through it. Precisely because it does not come from the Academy, and is therefore not inherently Eurocentric, it is able to maintain an emphasis and aesthetic of dance, singing, music, poetry,

and storytelling, all in a unified art form.

As a musical ethnographer, Cain is documenting histories and narratives, often learned from the elder musicians, that contain the teachings and understandings within the African-American musical communities, which are often in contrast to what is written about them in the Jazz history books, and which continue primarily as oral traditions. The communal dynamics of music make it a valuable field from which to explore necessary cultural reparations when it comes to indigenous peoples, aboriginal peoples, and people of colour.



# Circumcision and Masculinity



DR. JONATHAN ALLAN  
Canada Research Chair in Queer Theory

## To circumcise or not to circumcise?

Expectant parents often find themselves tackling this question.

The answer to the question is complicated by diverse medical opinions, religious traditions, and secular norms. This project sets out to understand how the foreskin is represented, theorized, and critiqued in the social sciences and humanities, in the biomedical sciences, and in policy documents of medical associations. When completed, this project will be one of the first full-length studies to consider circumcision by way of the foreskin as well as what it is, what it does, and why it matters.

The foreskin and its presence — or absence — has a long history and has divided religions and cultures for millennia. However, in the late nineteenth century, the debate moved from a religious debate to a secular debate. “It’s not normal,” declares Charlotte in an episode of *Sex and the City*; what’s not normal, she insists, is the foreskin (despite the fact that the vast majority of the population, worldwide, has a foreskin). The foreskin has become, in our times, hotly debated, deeply suspicious, ephemeral, enigmatic, perhaps a mere curiosity. The debates over “to circumcise or not” are so complicated and so vexed that one hardly knows where to begin. As such, this project asks: what are the secular reasons to circumcise?

To complete this research, I am reviewing material from a wide range of sources. If you were to come into my office, you’d likely find stacks of medical articles alongside *What to Expect When You’re Expecting* and other pregnancy books. Simply put, the first challenge is to figure out who is talking about the foreskin (and circumcision) and for what reasons. Nearly every pregnancy book, for instance, has some sort of opinion on the foreskin. From this vantage, I begin to track and catalogue how we think about the


foreskin and its removal. Over the summer of 2016, thanks to funding from the Brandon University Research Committee, I spent a great deal of time at the Wellcome Library (London, England), which is a library devoted to the history of medicine, and the British Library. While there, I reviewed and studied everything from dissertations to manuals about safe sex, books about puberty, and activist literature (there is a growing body of “intactivist” literature!). In coming months, I hope to do more archival research at the Kinsey Institute at Indiana University, USA.

The most commonly cited reasons for circumcision include: “to look like dad” or “to look like peers.” Thus, the arguments are not religious in nature, nor are they oriented towards health, they are about social inclusion, or even, about aesthetics. As such, I’ve written an article on “foreskin aesthetics,” which tackles the idea that the foreskin is ugly. If we look at the history of art, the male nude is almost always not circumcised. Even Michelangelo’s David has his foreskin!

This research will be of value to various stakeholders, including parents, medical doctors, and theorists and scholars of gender and sexuality, as well as people who are curious about the politics of circumcision. Ideally, this research will participate in policy discussions around routine neonatal circumcision, especially since this research aims to provide a full-length study of the foreskin. This research project has been approved by the Brandon University Research Ethics Committee.







# Keeping Toads Safe on the Roads



DR. PAMELA RUTHERFORD  
Associate Professor, Biology  
ALYSSA EAGLE AND SHAWNA PHILPOTT

Of all ecosystems, wetlands are the most impacted by roads because roads destroy wetland habitat and/or force animals to move across roads to access wetlands for breeding and foraging during spring and fall migration periods.

Unfortunately, many reports indicate roads densely covered with dead animals during these migration periods. Amphibians and reptiles are considered one of the most at-risk groups of animals, and unfortunately, many populations continue to decline due to loss of habitat, climate change, and other impacts by humans. Dr. Rutherford's research focuses on the conservation biology of amphibians and reptiles throughout Manitoba. She is particularly interested in determining the combined effects of habitat fragmentation and habitat loss on these species.

Currently, she is working with two Master's of Life and Environmental Sciences (MELS) Graduate Students, Alyssa Eagle and Shawna Philpott, on the effects of roads on amphibian and reptile populations in southwestern Manitoba. The researchers monitor amphibian and reptile activity along roads in southwestern Manitoba and conduct breeding surveys in the spring by working at night and recording any males that are calling (each species has a unique call and males

call to attract a mate). They also collect data on animals found on the roads (either dead or alive) and in roadside ponds, and on the water quality of the roadside ponds to determine if they are healthy habitats for all plants and animals. To date, two 'hotspots' of activity along roads in Manitoba have been identified: around Melita in southwestern Manitoba and around Tolstoi in southeastern Manitoba. These 'hotspots' include three of the species that are of conservation concern (northern leopard frog, great plains toad and western tiger salamander).

**Amphibians and reptiles are considered one of the most at-risk groups of animals, and unfortunately, many populations continue to decline due to loss of habitat, climate change, and other impacts by humans.**

Using this information, the researchers can work with Manitoba Infrastructure to implement strategies to ensure that roadside ponds are providing healthy habitat for all plants and animals, and that mass mortality of migrating animals during spring and fall is minimized.

Funding for this research is provided by the following organisations: Manitoba Infrastructure, Manitoba Sustainable Development, Manitoba Graduate Scholarship, Brandon University Research Committee, Brandon University Student Union, Canada Summer Jobs, and Lake Winnipeg Research Consortium.

# Accessible Muscle Growth for All?



JOEL KRENTZ

Assistant Professor, Physical  
Education, Faculty of Education



A wide range of populations may directly benefit from increasing muscle mass. Often we think only of athletes or hulking bodybuilders as those whose goal it is to achieve increases in muscle size.

Frequently forgotten are the elderly populations experiencing sarcopenia (loss of muscle) due to aging or various clinical populations suffering from disease induced cachexia (weakness and muscle loss due to illnesses such as cancer).

For these and many other populations increasing muscle mass is vital for health and in performing day-to-day activities in order to maintain independence. Training to increase muscle mass often requires high levels of exertion and may be intimidating and of limited accessibility to those who need it most.

If you have ever been on the losing end of an arm wrestle, then without knowing it, you have already performed a maximal eccentric contraction. Eccentric contractions occur when your muscle is being lengthened while you are performing a muscle contraction.

Think back to losing the arm wrestle, you are trying to move in one direction but the force you are pushing against—your opponent's strength—is overcoming you and pushing you the opposite way. Such contractions also occur every time you engage in resistance training such as lowering the bar down to your chest during a bench press or controlling your body down to the floor during a push-up. Advanced weight lifters have long enjoyed the beneficial effects of maximal eccentric contractions for increasing muscle mass. Dr. Krentz' research utilized a randomized, controlled, experimental design. Thirty-one young adults (13 females, 19 males) were randomly selected to either a high intensity

eccentric training group, a lower intensity eccentric training group, or a control group (which did no training). Training was conducted on the elbow flexors (biceps) and was performed 2-3 times per week for eight weeks. Muscle thickness of the biceps was measured using ultrasound before and after the eight weeks of training. Participants self-reported perceived exertion ratings on a scale of 1-10 after each workout to indicate how hard they perceived each workout to be. Muscle soreness and changes in muscular strength were also monitored.

The main finding of this research was that compared to the control group, participants in both the high intensity and low intensity eccentric training groups significantly increased their muscle size. Interestingly, the muscle size increase was similar in both training groups. Importantly though, the lower intensity

group perceived the eccentric training felt easier and required less exertion.

**Submaximal eccentric training may be used to increase muscle mass in populations that might benefit from increased muscle mass but may otherwise have difficulty achieving it.**

While this is a preliminary study using college-aged students and focusing on training a single muscle group (biceps), the findings suggest that lower intensity eccentric training may be an advantageous way of increasing muscle mass in more diverse populations who cannot train with maximal intensities

or high exertion levels. Professor Krentz' current research continues to investigate adaptations related to high versus low intensity training of varying contraction types with the aim of determining more optimal training prescriptions for various populations with specific training goals and limitations.



## Designer Drugs for Brain Tumours

DR. VINCENT CHEN, DR. BRYAN HILL,  
ALISHA POOLE, AND EMMANUEL  
OJEFUA BRYAN HILL

Glioblastoma multiforme is most common type of primary malignant brain tumour. Average survival, even with aggressive treatment, is less than a year. Little is known about the molecular mechanisms of cancer cell invasion and our research works towards understanding a family of enzymes that first clear a path for cancer cells to invade. The overall goal of this work is to develop therapies to prevent the migration of human glioma cells.

Using an established model of glioma cell migration, we have observed that highly motile gliomas will promote movement by releasing these enzymes into their environment. Associated with glioma invasiveness, we have identified more than 100 proteins for further characterization.

Using this information, we are now developing novel small molecules and peptide-based inhibitors. Using a 'lock and key' approach, compounds are designed to specifically bind and inhibit these enzymes with the hope they will obstruct the movement of GBM cells. Signaling pathways downstream of drug inhibition will be further characterized to identify additional targets for therapeutic development.

## Why do Newly Graduated Nurses Leave the Nursing Profession?

KATHRYN CHACHULA

The nature of nursing work in Manitoba predisposes nurses to the development of post-traumatic stress and an estimated 13% of newly-graduated Canadian nurses intending to leave the nursing profession. The ultimate goal of this research is to identify resiliency solutions and strategies that can be applied during nurses' undergraduate education to help ensure they are well-prepared for workplace challenges and traumatic stress.

One of the key findings revealed that newly-graduated nurses require a variety of supports to establish a nursing identity and remain in the profession. These included reasonable patient-nurse ratios, a meaningful workplace orientation, respectful interprofessional teamwork, and managers who were authentic and understanding. In nursing, professional satisfaction and perseverance depend on thoughtful and compassionate relationships, from nursing school onwards. A sustainable nursing workforce cannot exist without the bedrock of interpersonal support fostered through nursing education, health care policy, and workplace culture.

## Studying a Hutterite Disorder and Cancer Using Baker's Yeast

DR. MICHAEL CHARETTE, JAMES CLUFF,  
ELISE POOLE, COURTNEY HARRIS, AND  
TRENT NELSON

Bowen-Conradi Hutterite Syndrome is a genetic disorder unique to the Prairies, part of a group of diseases called ribosomopathies. These disorders, which include many cancers, are due to the incorrect assembly of ribosomes.

We used the baker's yeast as a "model organism" to re-create the disease because yeast is easy and inexpensive to grow. We can also genetically engineer yeast cells to ask detailed questions about the role that these proteins play in the cell—all things that are much more difficult and expensive to do in human cells. We found that Bowen-Conradi Syndrome slows cell growth and changes the structure of ribosomes. We have also potentially identified new regulators of ribosome assembly and cell growth in cancer.

Better understanding the problem has already helped us propose the first treatments that may reduce disease burden or progression. We will be testing these drugs soon in our yeast model.

## Measuring the Challenges of Rural Physician Supply in Manitoba

DR. JOHN MURRAY  
AND DR. CHARLES PENNER

Canadians tend to have an expectation that they will have access to medical care where and when it is needed, no matter where they live. In recent decades, large, urban comprehensive medical facilities have shouldered the burden of more specialized care, but many communities that have only episodic access to a physician or none at all. It is important to understand the factors which incline front-line health care professionals to locate longer-term in rural or remote Canada.

Comparing physicians who are in Manitoba urban centres to those who are practicing outside of these, some interesting trends and associations were noticed. Almost half of all doctors from the study groups who are now in rural communities participated in one or more specialized rural medicine programs. Moreover, all those who had accessed three or more points of contact at the Manitoba Office of Rural and Northern Health are in rural/remote practice today. Someone who had participated in four or more of these programs was as much as 10 times more likely to have remained in rural practice.



# Identifying Childhood Experiences in the Past



DR. EMILY HOLLAND  
Assistant Professor, Anthropology

DR. HUGO CARDOSO  
Assistant Professor, Archaeology (Simon Fraser University)

DR. LESLEY HARRINGTON  
Assistant Professor, Biological Anthropology, University of Alberta

This study examines the 20th-century skeletal remains of children and adolescents from the Luis Lopes Collection, curated at the National Museum of Natural History and Science Lisbon, Portugal and the Bologna Documented Collection curated at the Museum of Anthropology at Bologna University, Bologna, Italy.

These skeletal collections are unique as each individual is associated with important biographical information such as age at death, address, sex, cause of death, marital status and occupation. The ability to use growth disruption as an indicator of social and cultural adversity in past populations is hampered by the lack of data linking growth disruption to known social and cultural variables. By comparing skeletal and dental evidence of growth disruption in relation to social circumstances, it will be possible to identify the various ways in which growth disruption can inform on the social environment of children

Skeletal growth is a dynamic energy demanding process. When interrupted due to environmental stressors such as malnutrition and disease, growth will slow down or even stop to devote energy to life-sustaining functions. Evidence of growth halting persists in the skeleton, providing a window into someone's experience of childhood health long after death. Through a detailed analysis of individuals' skeletal remains, it is possible to reconstruct their growth experience and use it to interpret their

experience of childhood, thereby enriching our understanding of past societies.

Ultimately, biological anthropologists are limited in their ability to investigate 'childhood health' in past societies because they work with the skeletal remains of the dead or those who did not survive. They are therefore trying to reconstruct health by assessing the least healthy members of the population. By understanding the differences in skeletal and dental growth between the sexes and over the life course we can better understand how ill health is manifest in skeletal remains and how it relates to social and economic factors. Such an understanding will help us understand how children are able to adapt to, or fail to adapt to various stressors associated with different socioeconomic situations and if there are sex-specific differences in survival.

This research was supported by a Social Sciences and Humanities Research Council of Canada Insight Development Grant. Hugo Cardoso (Simon Fraser University) is the principal investigator on this grant.

## Employability Assets of Employees in a Diversified Workplace

DR. KAREN REMPEL AND DR. KIM LEMKY

Given the demographics of Manitoba in general, and Northern Manitoba in particular, a diversified workplace means that the majority of employees will be of Indigenous ancestry. This research identified employability assets of Indigenous employees: the skills, knowledge, abilities and personal attributes that enable them to gain initial employment, and, maintain and obtain new employment. Employability assets include academic skills, professional or workplace knowledge, and attitudes, such as interpersonal skills, team work and problem-solving.

The findings from the research resulted in a list of 38 of employability assets of employees work-ing in a workplace employing Indigenous workers. Some of the most notable employability assets for employees in a diversified workplace were:

- ▶ *the emphasis on essential core literacy and numeracy skills, but not necessarily high school, community college or university credentials;*
- ▶ *the importance of Indigenous identity;*
- ▶ *the ability to use knowledge, skills and attitudes in a variety of workplace settings;*
- ▶ *the significance of a resume;*
- ▶ *the ability to participate as a team member;*
- ▶ *critical thinking skills to help problem solve;*
- ▶ *the capacity to work with others; and*
- ▶ *the demonstration of work ethic and professionalism.*

The researchers also found that while knowledge, skills and attitude assets are necessary, they are not sufficient for an individual to sustain and advance in employment. Employability assets also include an individual's awareness of abilities, limitations, work-place responsibilities, decision-making skills and job-search skills.

The results of this research provide a list of key employability assets necessary to gain and maintain employment, and obtain new employment if required, specifically for the Northern Manitoba labour market. Employers as well as employment services and education and training organizations can use this information to plan workplace training and education programs. Prospective and current employees can use this information as a guideline to develop their employability assets.

## A Healthy Neighbourhood: Voices of Indigenous Youth

DR. KATHY MOSCOU, DR. CHRIS BEEMAN AND DR. KAREN REMPEL

The Healthy Neighbourhood Photovoice Project mobilized Indigenous youth in Brandon to use photos and narratives to provide their perspectives on the characteristics of a healthy neighbourhood. The photographs and stories were also used to encourage conversations about issues and actions that can help build and sustain healthy neighbourhoods and communities.

A healthy urban neighbourhood meets the physical, social, health, economic, and cultural needs of all community members including children and youth. Some of these needs include employment opportunities, access to public services, safety, cultural centres, and green spaces. Healthy neighbourhoods are inclusive, creating feelings of connectedness. For the growing population of urban Indigenous children and youth, living in a healthy neighbourhood helps shape their sense of belonging, personal aspirations, and civic engagement. Relationships among neighbours create feelings of trust that can last a lifetime.

The perspectives of Indigenous people in Brandon about healthy neighbourhoods are essential components of community conversations. The photos and narratives from these Indigenous youth provide some of these perspectives and helping to extend broader conversations about Indigenous children and youth in the community.

The photos and narratives revealed that the Indigenous youths' perspectives of a healthy neighbourhood were grounded in their strong sense of spirituality, personal and family relationships, and a connection to the natural world. Many of the Indigenous youth participants felt a strong connection to the land and believed that a healthy neighbourhood had green spaces as well as spaces for engaged social growth. We also found that the people, environment, and infrastructure are essential to a healthy urban neighbourhood. Access to community centres, safe housing, and educational institutions are important elements.



# Terrain Models From UAV Imagery



DR. DION WISEMAN

Associate Professor, Geography

JURGEN VAN DER SLUIJS AND TOBI HOFFER

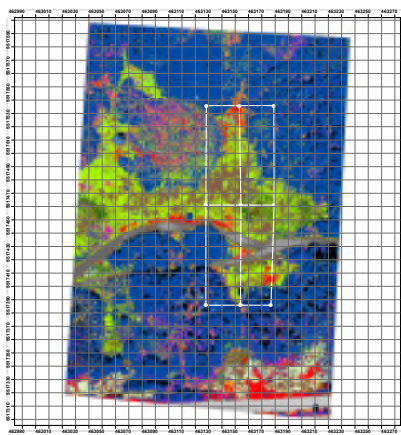
Recent honours graduates in  
Geography

There is a rich tradition in the natural sciences of utilizing remotely sensed imagery for mapping Earth's surface and creating 3D terrain models.

Remote sensing is defined as the acquisition and analysis of data collected for an object, area, or phenomena without direct contact.


The imagery acquired with an Unmanned Aerial Vehicle (UAV) is a form of remote sensing not unlike the satellite imagery seen in Google Earth, Google Maps, or other online mapping applications. It can provide more detail than many commercial satellites or airborne sensors. The most common scientific applications of UAV imagery include the classification of images to produce land cover and land use maps and the development of high resolution 3-dimensional terrain or surface models called DEMs (digital elevation models). The historical limitations of cost and availability have been eliminated with the widespread availability of inexpensive UAVs capable of acquiring high quality imagery essentially anytime the user desires. This research evaluated the accuracy of UAV-derived DEMs. Survey grade GPS equipment and a total station were used to collect 3D coordinates at two

study sites located in the sand hills in and adjacent to CFB Shilo, Manitoba, at accuracies ranging from a few centimetres to millimetres. Imagery was then obtained for these same areas using three different UAV platform and sensor configurations at various altitudes, spatial resolutions, degrees of image overlap, and combinations of vertical and oblique imagery. Results indicated that the accuracy ranged from approximately 15 cm down to as little as 3 to 5 cm and was primarily dependent on image overlap, spatial resolution, and the inclusion of oblique imagery. Overall, DEM accuracies were typically 3 to 5 times higher than the spatial resolution of the imagery obtained but could be improved by adding oblique imagery.



One of the few disadvantages of UAV imagery is the limited area that can be covered compared to satellite or aerial equivalents. The sites in this study were only a few tens of hectares in size, yet hundreds of photos and several UAV flights were required to collect the imagery. Evaluating various flight parameters and establishing 'best practices' for collecting imagery used to develop UAV-derived DEMs that requires fewer photos and, therefore, fewer flights, can significantly reduce fieldwork costs and image processing time. The adoption of a standardized protocol for assessing and reporting accuracy facilitated evaluation and reporting of results.





# Making Music in the 'Post-Everything' Age

DR. PATRICK CARRABR   
Professor, Faculty of Music

Each year, one in five people in Canada experiences a mental health problem or illness. By putting the spotlight on these extremes and placing them in the context of both beauty and what some would characterize as ugliness, Dr. Carrabré's music seeks to provide listeners with an opportunity to encounter ideas beyond their experience and beyond easy words.

Living in the 'post-everything' age, it is impossible to escape a myriad of historical and contemporary influences that end up in our music. This challenges both the composer and the music lover to contextualize these multiple layers of meaning coded within any given composition. We have inherited an 'idealized' romantic image of the composer as a tortured genius. Misunderstood until long after a tragic early death, his art demands that he be obsessive and difficult during his life (it was pretty much always a 'he'). Western art music boasts many examples of such composers, who often seem to have crossed over to the dark side, afflicted by mental illness or other demons that place them at the extreme edge of some behavioural Spectrum. In Dr. Carrabré's words, "I have often wondered whether the compositional process demands that one step over the edge to reach our creative potential. While I continue to hope that the answer to that question is no, I am completely sympathetic to those who have lost their grounding in the ecstasy and anguish that is creativity."

This research spans the trajectory of a set of five songs entitled *Crazy*, from their initial inspiration, to public performance and dissemination as a sound recording. The words for this collection are taken from famous poems, each in a different European language reflecting themes of murder, abuse, obsession, dominance, lust, and pain -- all topics that weave their way through the history of western art music. Dr. Carrabré also utilizes pre-existing musical references from historical composers, including Monteverdi, Gesualdo, Schumann, Berlioz, Tárrega, and Grainger. While Dr. Carrabré has written the majority of the music, each song quotes from one of these other composers, who have written incredible music while dealing with a range of issues that fall outside the bell curve of what most would associate with 'normal.' For

example, Schumann asked to be committed to a sanatorium for the last few years of his life, after trying to commit suicide and seeing various types of hallucinations. Grainger, on the other hand, constructed a museum to himself, which includes the collection of flails and lashes used in his fetish and bondage experiments.

*Crazy* wraps these complicated connections within Dr. Carrabré's own personal musical language, which already embraced a range of sounds from traditional chords and singable tunes to harsher dissonance and more angular melodies. By augmenting the acoustic sounds of piano and voice with electronics, both synthetic and sampled, he was able to explore the border territory around the edge of beauty.

Art music can both challenge and entertain. As the public phase of the project is just beginning with the release of the audio and video components, it will take time to assess the artistic and commercial response to the music and the methods of distribution.

*Crazy*, the album, will soon be available on Apple Music and Spotify, as well as on iTunes (on Winter Wind Records). A full performance appears in a documentary, entitled *New Music*, on MTS TV's *Stories from Home*.

Dr. Carrabré's work on this project has been supported by The Manitoba Arts Council, The Brandon Chamber Players, the Brandon University Research Committee (BURC) and the Faculty of Music Endowment Fund.





## Northern Oral Language and Writing Through Play

DR. BURCU YAMAN NTELIOGLOU  
DR. SHELLEY STAGG-PETERSEN, UNIVERSITY OF  
TORONTO AND DR. LAUREEN MCINTYRE, UNIVERSITY  
OF SASKATCHEWAN

This research is addressing the need to close literacy achievement gaps between Aboriginal and non-Aboriginal children, and between rural and urban children. The overarching goal of this research is to enhance the oral and written language of young children living in rural, northern Canadian communities. Funded by the Social Sciences and Humanities Research Council, this seven-year project involves conducting studies focusing on language learning and literacy development in schools and daycares in northern and rural Manitoba, Ontario, Saskatchewan, and Alberta.

As lead investigator in Manitoba, Dr. Burcu Yaman Ntelioglou works with over a hundred participating children and their teachers in a northern rural school division and an Aboriginal Head Start program. Viewing teachers as active participants in research about their own and each other's teaching, reflective collaborative practitioner inquiry allows Dr. Yaman Ntelioglou to examine classroom practices and how improvements can be made to help enhance the future practices of other educators who are working to support the language and literacy development of rural, northern and Aboriginal children.

This seven-year project is ongoing. One of the central preliminary findings of this study is the significance of situated and culturally-relevant practice in language and literacy education. Language minority students, such as some Canadian Aboriginal students and newcomer immigrant students, engage in many different language and literacy practices outside the school. Within schools, however, the teaching of literacy is often narrowly focused on the literacy in the dominant language, failing to acknowledge/build on the multilingual and multiple literacy practices of the students. This study also documents that culturally-relevant and embodied play-based approaches in language and literacy teaching provide an important platform for students to draw on their multilingual and multimodal repertoires. The research features students' language and literacy practices in everyday 'real' life spaces highlighting the significance of making better home, school, community connections.

This study supports the creation of new instructional approaches, materials and assessment practices that will help educators bring greater equity, creativity and criticality in language and literacy education in schools.

## Documenting Decision-Making in Action Research

DR. CATHRYN SMITH

This research focused on how to document decision-making in a complex action research study. Unlike other research methodologies, action research means data is analyzed while the study is being conducted and findings are used to adjust subsequent cycles. The challenge for action researchers is to document all the researcher's decisions throughout the research process..

Action research is a methodology which can be responsive to emergent problems as research methods can shift and evolve to better address the research question(s). To maintain the integrity of the research, all decisions must be informed by data analysis. Establishing systematic techniques repeated through each research cycle facilitates comparisons, detection of patterns, and shifts in the findings. Action research can be used to study and improve one's own practice. Educators use a particular branch of action research called practitioner inquiry to study one small aspect of teaching. I use a four-step action research cycle consisting of look, think, act and reflect. By making small adjustments in professional practice and carefully examining the impact of the change through systematic data analysis, teachers can continue to increase their efficacy, making action research a powerful methodology to improve instruction and learning.

The researcher facilitated seven leadership development sessions with a cohort of teacher leaders. The same strategies were used for each session to systematically document, analyze, and act upon the findings. The Pre Flight Planning procedures included the preparation of the Researcher's Action Research Cycle, Session Agenda, Facilitation Guide and Researcher's Checklist. The In Flight Observation procedures included documentation and feedback through the Participants' Response to Activities, Participant Reflections and Researcher's Reflections. The Post Flight Analysis procedures used to make sense of each session and document what was being learned included the Logic Model, Session Summaries, and Cumulative Themes. Once all ten steps were complete, the focus would shift towards planning for the next session.

This systematic method of documenting decision-making in an action research study can be applied to other types of process-heavy research. The ten-step process effectively documented a complex learning environment, facilitated sense-making from multiple forms of data over an extended period of time and proved effective throughout a complex action research study.



# Inclusion Through the Arts



DR. PATRICIA DOUGLAS

Assistant Professor, Educational Psychology and Student Services

The World Report on Disability documents a stark picture of marginalization, under- or unemployment, poverty, barriers to education and health, violence and discrimination for the 15.6% of the global population who lives with a disability or chronic health condition.

Access to and meaningful inclusion in education—a basic human right—is identified as key in change efforts. In the midst of calls by the United Nations, disability rights organizations and local governments for the inclusion of persons with disabilities in all aspects of life, education systems struggle with barriers to meaningful inclusion for persons with autism.

Students commonly face bullying, isolation or segregation, while parents and teachers grapple with limited resources and strained relationships within school communities and between schools, school boards and families.

Special education categories define disabilities such as autism as a deficit—a problem that needs fixing—inadvertently reproducing marginalization and educational disparity. Little is known about experiences of exclusion and belonging from the perspective of students with autism and those that work with and care for and about them. Dr. Douglas uses a critical disability studies approach, understanding inclusion as a

social justice issue and autism as an integral and valuable part of human diversity, to address this gap in knowledge. This is particularly important in light of the current educational landscape and sharply rising rates of autism diagnosis.

The project focuses on the knowledge and experience of persons with autism through key informant interviews and digital storytelling workshops. Currently, Dr Douglas is in phase one of this research, conducting key informant interviews with people with autism, educators, and families in Toronto, Ontario, to learn more about experiences of schooling. She is holding digital storytelling workshops with

these same groups, where participants will make their own short first-person films about their experiences of autism and schooling. Dr. Douglas is also making a documentary that follows the research process, documents how

inclusion unfolds in the space of the workshop, and explores the power of the arts to enact change. Phase two of the study will include professional development forums for educators and policy makers in Brandon, Manitoba, and Toronto, Ontario. These forums will incorporate interview findings and digital stories, and measure the impact of first-person stories on educators' understandings of autism and inclusion.

**The project focuses on the knowledge and experience of persons with autism through key informant interviews and digital storytelling workshops.**

# Understanding Quality in Small Town Tourism Destinations

DR. DOUG RAMSEY AND DR. CHRISTOPHER MALCOLM

Rural communities throughout the world struggle to maintain livelihoods. One response is tourism development. This research first examined the perceptions of visitors to a rural and small town tourism attraction, then developed a typology of rural and small town destinations. This typology, using the Canadian Fossil Discovery Centre in Morden and “Bruce” the mosasaur as an example, showcases the rich cultural and amenity values that exist in rural and small-town regions.

Visitors to the Centre reported high levels of satisfaction but not all fully understood the interpretive displays. Visitors generally liked the layout and saw great educational value. Changes desired included a larger venue with more accessibility, more interactive displays and audio/video guides.

The results are helpful to the Centre and also other tourism attractions and destinations that are striving to improve their product and/or increase visitation. In fact, when word got out about this project, other museums contacted the researchers and, supported through the Manitoba Museum Association, similar surveys were conducted in 24 community museums throughout southwestern Manitoba. The results of these projects are being analyzed with summaries to be sent to each of the participating museums. It is hoped that the recommendations made visitors will help improve already rich and diverse museum products. It is further hoped that the publication of the results will extend well beyond this immediate region.

# The Importance of Agrarian Reform

DR. WILDER ROBLES

Despite rapid economic growth, impressive technological advances, expansion of educational resources, closer global trade integration, and significant foreign aid during the last seven decades, systemic global poverty continues to persist, especially in rural areas. These are subsistence peasants, herders, fishers, seasonal workers, artisans, and indigenous peoples who struggle to meet their basic needs. Landlessness is the main source of rural poverty, and this issue is the legacy of colonialism.

This study examined the interplay of peasant mobilization, agrarian reform, and cooperative formation in Brazil from 1985 to 2015. The study gathered a total of 480 hours of taped interviews with academics, peasants, students, workers, government officials, church leaders, and co-op members. Agrarian reform was found to have a limited impact on land inequality and rural poverty, while concerted peasant

mobilization is fundamental to overcoming landlessness. As well, nurturing cultures of co-operation and solidarity are vital to making co-operatives viable. However, forming co-ops is inherently political and conflictual; conflict management can help overcome this. The state has to play a major role in supporting agrarian reform by providing access to financial, educational, technological, and human resources.

This study has greatly contributed to the research literature on agrarian reform, peasant movements, and agricultural co-operatives in developed and developing countries. It has also assisted local governments and peasant organizations dealing with rural poverty in all its forms. The lessons and experiences learned from this research study will be shared with Northern Manitoba Aboriginal communities in their quest for food security/sovereignty.

# Canadian Prairies and the Case of Shelterbelts

DR. BILL ASHTON

A proposed Working Tree social marketing program aims to expand on-farm tree shelterbelts on the Canadian prairies. This research evaluated previously completed social marketing programs to see whether the program might achieve its goals. Key measures were used as benchmarks or guides to assess the likelihood of success. This framework also incorporated social marketing theory and practice to present a novel approach.

So, how can previous social marketing efforts help gauge a pre-launch assessment? While there may be different ways to respond to this question, none offer a straight-forward answer.

The case-based approach led to challenges, including finding similar cases and accessing key data. This calls for an increased emphasis on evaluating and reporting social marketing cases with sufficient detail and transparency. Templates to report key indicators and quantified objectives might be suggested, and case study reporting could be encouraged.

Evaluations can provide insight into the next round of a program or campaign, inform practices as well as theories, and provide a basis for funding and support of different future programs. Evaluation or its absence forms the weak link in practice.



# Mapping the Milky Way



DR. TYLER FOSTER  
Professor, Physics and  
Astronomy

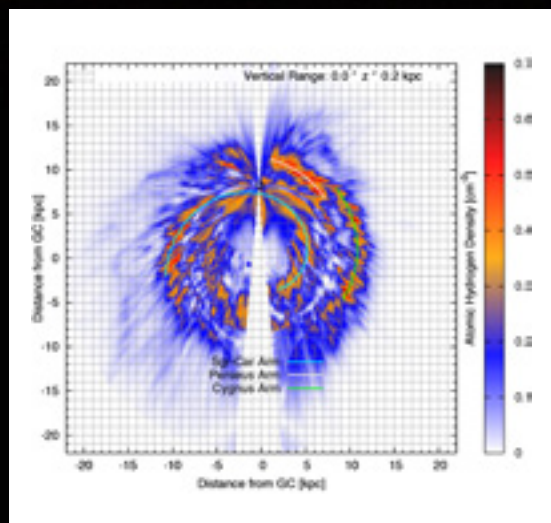


TYLER WILSON  
4<sup>th</sup> year physics major

The Milky Way galaxy is our home galaxy; a flattened disc of some 200 billion stars and gas that is arranged in a spiral pattern. As our own star, the Sun, is embedded in the disc, the only view we have is that of an insider: a thick band of diffuse milky starlight that encircles us around the sky. Having an accurate 3-D map of the Milky Way is a fundamental necessity to embarking on nearly any study of our galaxy. Yet, today astronomers still do not agree on even the most basic features of the Milky Way. How many spiral arms are there? Where is the Sun's place within the pattern, and where was it when it formed billions of years ago? How does the pattern change above or below the disc? How far from the Galactic centre does the pattern end?

Making a birds-eye "map" or plan-view of the Milky Way is as daunting a task – like being asked to map an entire forest while you are tied to a single tree inside it. Dr. Foster and his student, Tyler Wilson, are using a

mathematical approach and desktop-computational power to transform the newest radio telescope observations of the sky into a 3-D map of the Milky Way. The preliminary computed maps that they have generated are a large improvement over past attempts, with clearer and sharper definition of the spiral pattern. These maps show the clearest view of the Milky Way today computed by this technique; they make a significant contribution by confirming that the Milky Way is a 4-armed spiral galaxy and that the Sun is located not within a spiral arm but in an inter-arm region. The researchers also look forward to trying some more clever computational techniques they have dreamt up to fill in the "hole" in the Inner Galaxy!



This research is supported by Brandon University Research Committee, Brandon University Student Union Work-Study, and the federal government's Canada Summer Jobs program for their support of this research.



## Conducting Select Ensembles

DR. WENDY MCCALLUM

In North America, an auditioned or selected honour ensemble structure is used in divisional, regional, provincial, and national music contexts. Members of honor ensembles have the opportunity to interact with significant conductors, inspirational peers, and virtuosic soloists. This work included conducting the annual British Columbia and Ontario Provincial Honour Bands in fall 2016, followed by conducting the National Youth Band of Canada (NYB) in May 2018. The NYB, an auditioned ensemble consisting of performers aged 16-22, is the premiere youth wind ensemble in Canada. Performances included a final concert in Pollack Hall in the Schulich School of Music at McGill University.

Musicians, selected through a competitive selection process, formed the honor ensembles. They arrived capable of performing their individual parts and were guided to learn one another's parts, gain a greater understanding of the craft of each composition, and represent the composer's musical intent. Effectively designed programs contrasted diverse musical aspects such as form, style, tempo, meter, key area, date of composition and length and included complimentary works that motivate musicians to perform their best. Studying scores in detail created an aural image that was used during the rehearsal process. Hearing each score in the "mind's ear" is essential before the rehearsal process begins. In rehearsal, McCallum modeled metacognitive process and provided opportunities to develop critical thinking approaches, problem-solving strategies, and creative solutions to unique situations. In a short period of time (three to four days), musicians achieved clarity of expression for each composition that was presented to audiences.

Conducting musicians from diverse musical backgrounds necessitates flexibility in technique and pedagogy. Works were selected to be musically and technically challenging but also engaging to performers and audiences. Through the use of effective rehearsal design, a conductor can prepare and present performances that are artistically rewarding to ensemble members and audiences. Audiences at performances may include school-aged students, peers of ensemble members, family, and community. School-aged audiences do not necessarily attend live performances regularly, and the honour ensemble concert is both inspirational and transformational in an understanding of music and live performance. Instrumental music educators gather during honour band rehearsals to observe rehearsal strategies, learn unfamiliar repertoire, and gather ideas about interpretation. A significant byproduct of the honor band experience is the professional development potential for musicians and music educators.

## Verbatim Theatre

JIM FORSYTHE

Verbatim Theatre is the process of turning first-person narratives into theatre without the addition of fictionalized text or outside sources. The only words used come from recorded interviews with the volunteer participants. After the interviews are transcribed they are edited and collaged to create, hopefully, an entertaining and illuminating evening of theatre. Currently, Verbatim Theatre consists of two simultaneous projects. The first is a project commissioned by the Acquired Brain Injury Support Group of Westman and the second has as its subject the recent cohort of Syrian refugees that have arrived in Canada.

Marginalized communities often have a very difficult time getting their story out to the wider community. Stereotypical perceptions and biases are frequently the results. Society divides due to this lack of communication, and unfounded fear of 'the other' becomes pervasive. To really get to know someone you have to talk to them. The hope is these conversations will create a window to allow us to get to know each other a little better.

With the assistance of Westman Immigrant Services, meetings were arranged with recently arrived Syrian families in Brandon. Following the Brandon round of interviews, the process was repeated in Montreal in conjunction with Teesri Duniya Theatre Company, a Montreal-based theatre specializing in creating work for and about marginalized communities. Once a draft text was completed, work began with actors to evaluate the dramatic flow and consistency. The same process was utilized with the survivors and caregivers from the brain injury community.

Survivors and caregivers of the Acquired Brain Injury group were found to be isolated and unfunded. This is a condition that affects all ages and in the case of an accident can be life changing in an instant. With the Syrian refugees, the overriding emotion is one of sincere thanks to not only their individual sponsors and the government but to us as a nation. "You have hugged us as a mother would hug a child," is a representative quote. However, there is growing frustration with the inability to have foreign credentials approved and to get adequate language training so that they can join the workforce. These are people who have overcome great obstacles and have witnessed horrors we cannot even imagine. They are anxious to contribute to Canada.

Both projects will find their way onto the Drama course syllabus at Brandon University.

# Improving Mother and Infant Interactions



DR. PENNY TRYPHONOPOULOS  
Assistant Professor, Nursing

**“It is easier to build strong children  
than to repair broken men”  
— Frederick Douglass, 1817-1895**

Postpartum depression (PPD) is a major public health issue and is known as “the thief that steals motherhood” because depressive symptoms interfere with a mother’s capacity for understanding and enjoying her baby. It affects approximately 1 in 5 mothers. Infants may perceive PPD as stress, which can trigger the release of the stress hormone, cortisol, which, in turn, negatively affects developing infant brains by decreasing brain volume and limiting new brain cell growth. Compared to infants of non-depressed mothers, infants of mothers with PPD are less sociable and more fearful of strangers, more easily frustrated, have more separation anxiety and insecure attachments, and more behavioural and cognitive problems. Later on, these children also have increased rates of major depressive disorder, anxiety disorders, and alcohol dependence often persisting into adolescence/early adulthood.

Successfully treating a mother’s depressive symptoms (through antidepressants and psychotherapy) does not always benefit mother-child relationships. Parenting training to promote sensitive and responsive maternal-infant interactions may be helpful in promoting healthy development in children of mothers with PPD. This research builds on a successful pilot

that demonstrated that nurse-guided video feedback improved mother-infant interactions in the context of PPD. VID-KIDS offers mothers affected by PPD a strengths-based approach for improving sensitivity and positive responsiveness toward their infants.

The study will evaluate the effect of the VID-KIDS intervention among depressed mothers. It is a 10-week randomized control trial (aka experimental research project). Mothers in the intervention group will receive 3 video-feedback sessions typically lasting between 60 to 90 minutes, which will be delivered by a specially trained Registered Nurse.

The anticipated contributions of VID-KIDS for families include improving maternal-infant interactions and infant developmental outcomes via reducing infant stress and

reducing maternal symptoms of depression, anxiety, and parenting stress. VID-KIDS will also contribute to our understanding of effective methods for enhancing the quality of relationships between depressed mothers and their infants. Finally, VID-KIDS can improve health service delivery and

support resources for families affected by PPD. If the VID-KIDS trial is successful, we will examine integrating the program into existing services for childbearing families (e.g., through Public Health).

**Successfully treating a  
mother’s depressive symptoms  
(through antidepressants and  
psychotherapy) does not always  
benefit mother-child relationships.**

# Soldiers' Wives and the British Army



DR LYNN MCKAY  
Faculty of Arts



Historians have long puzzled over the relationship between the working class and governing elites. This problem results from the fact that there are few sources available reliably describing the strategies, tactics, aspirations, and preferences of ordinary men and women of the past in dealing with authority.

One of the few instances where evidence of the relationship between the working class and governing elites does survive, concerns the wives of British soldiers during the nineteenth century. Research for this project required many long hours in the British government and regimental and army archives copying letters, muster rolls, officers' reports, census data, newspaper reports and memoirs, among other documents.

The story that emerges does not show army and government authorities in a flattering light. The lot of these women was difficult. The army and the government tried to discourage the marriage of soldiers, fearing that concern for dependents would lessen their ability and willingness to fight for the country, and that such families would be expensive to maintain. Accordingly, official support for soldiers' wives and children was reluctant, meagre, and often callous, which frequently resulted in real hardship for these families. Often, wives were not allowed to accompany their husbands on the many overseas postings that were the norm for the British army in the heyday of the empire. These women were stranded on quaysides as their husbands sailed away with their regiments and left to cope however they could in an era in which authorities provided no mechanisms or compulsion for soldiers to transmit money home.

Given that regiments typically spent up to a decade or more overseas, and up to twenty years if sent to India, this treatment effectively destroyed these family units.

Wives who did manage to get permission to accompany their husbands were subject to army discipline and its many

regulations, and had to do backbreaking work—usually laundry—for very low pay in exchange for the food and shelter provided by the army.

In spite of the treatment, which to modern sensibilities seems heartless, soldiers' wives were not passive victims. Most of them were shrewd, independent, and often willing to fight for better treatment from the immensely more powerful army and government authorities. By the 1870s, the army and the government did begin to initiate reforms that by the 20th century would result in decent housing, education, and financial support for military families, but did so without any real understanding of their needs or consultation with them. Again many soldiers' wives at times demonstrated both a canny ability

to reshape support programmes to meet their actual needs and to support each other when faced with hardships resulting from ill-conceived policies and practices.

The story of these women, while often deeply moving, at times infuriating, and occasionally funny, begs the questions of what value it might be and what we can learn from it. Telling their tale nevertheless

matters. First, it offers a rare window into the dynamics of class relations during this period. Second, recounting the story of these women helps to demonstrate the absolute necessity for centralised bureaucrats to consult, to listen, and to collaborate with clients when shaping initiatives to better lives. Top-down solutions did not work well for 19th century army wives; nor do they often do so today. If the past cannot provide us with ready-made solutions to our problems, it can identify dysfunctional approaches that we need not keep repeating.

**Given that regiments typically spent up to a decade or more overseas, and up to twenty years if sent to India, this treatment effectively destroyed these family units.**

## Good and Bad in iPad Instruction

DR. MARION TERRY

Using remedial iPad apps improves student performance in language arts and math skills, but at the expense of student engagement. Using project-based iPad instruction enhances student engagement and it also improves student performance in language arts and math, but to a lesser degree than remedial iPad apps.

The iPad phenomenon has taken North American educators by storm since Apple released the product in 2010. This research explores the efficacy of the iPad as an instructional tool in middle school classrooms. In particular, the researchers wanted to find out whether incorporating iPad technology would enhance student engagement and strengthen the literacy and numeracy skills of at-risk learners.

The two-phase action research project occurred in an alternative school in northern Manitoba, where the researchers selected 21 grade 5-8 students on the basis of low performance in English language arts and math. It compared direct instruction with indirect instruction. Some students spent 90 minutes a day, three days per week, using remedial iPad language arts and math apps over a period of six weeks. Others spent 65 minutes per day, three times per week using iPads in projects designed to enrich their regular classroom instruction over a period of nine months. Student engagement was assessed by attendance and discipline records as well as anecdotal feedback from staff and instructors. The students' literacy and numeracy skills were assessed through test scores.

Neither phase found significant changes in students' attendance or discipline records, and both found that the sessions were too long. However, the shorter, project-based iPad engagement was found to be more enjoyable. As well, the project-based phase mixed students of various ages and grade levels from different classrooms, enhancing student collaboration and interpersonal connections.

Both approaches showed significant improvements in student literacy and numeracy skills, with students engaged in direct instruction showing up to two full grade levels' improvement. Indirect project-based instruction showed less spectacular although still significant improvement, up to a full grade level.

iPad remedial apps can be effective in raising student math and ELA scores. However, regardless of whether iPads are used for direct instruction or indirect instruction, in terms of project-based activities to maximise student enjoyment, the research indicates that the time period should be kept to less than an hour for students in grades 5-8.

## One to One Computing in School

DR. MICHAEL NANTAIS

AND DR. JAQUELINE KIRK

The purpose of this study was to investigate the case of a rural high school's initiative to provide each student in grades 9 to 12 with a digital device to be used in the classroom and at home. The process of implementation was crucial. Infrastructure was in place and planning was deliberate, and leadership at the division and school level was vital. While many teachers desired that students all have the same device, giving students a choice was a major reason for the success of the initiative.

The learning environment supported risk-taking, creativity, collaboration, independence, problem-solving, and better communication. This environment resulted in deeper learning, faster access to information, and more student-centred pedagogy. Participants also described several challenges that were addressed. To start, infrastructure to support individual devices has to be in place and due to the nature of technology people must be prepared for the inevitable glitches that will take place when more devices are infused into an environment. Other challenges included: teacher resistance, students forgetting devices or not having them charged, and utilizing devices appropriately to decrease distractions.

## Enhancing Teacher Induction

DR. TOM SKINNER

In order to examine the needs of first-year teachers, the researcher used a one-time survey of teachers who had recently graduated and were in the last month of their first year. Many of the needs of first-year teachers relate directly to today's diverse student and evolving family dynamics. Special attention has to be given to establishing the classroom environment and space and then managing it. The diversity of behaviour found in today's classrooms adds to the challenge. The instructional process has become more complex as well. First-year teachers seem to need further knowledge and development in the area of child and adolescent rates of development. New teachers also require skills in developing a range of instructional methods as well as building a knowledge base in curriculum, curriculum resources, and curriculum implementation. Working with students has become more complex as well, as the diversity of social issues in today's school environment continue to evolve. Communication with the home needs to be enhanced; as a result, an area where many first-year teachers felt they were not prepared enough. Somewhat connected to this is building linkages with the school community, which can also be challenging for the first-year teachers.

# Why Newly Graduated Nurses Leave



KATHRYN CHACHULA  
Assistant Professor, Nursing

**Nursing is viewed as a caring profession. However, working closely with patients can be highly stressful.**

Nurses are regularly exposed to patient trauma as well as at times, physical and verbal abuse. Nursing is one of the most demanding and stressful jobs, and unsurprisingly, an area of chronic shortage, not only in Manitoba, but also across Canada. Despite efforts to address the Registered Nurse (RN) shortage, the Canadian Nurses Association predicts an estimated shortfall of 60,000 RNs by the year 2022. Approximately 43% of new nursing graduates report a high level of psychological distress, with as many as 88% of the nursing workforce reporting exposure to traumatic encounters involving verbal and physical threat. Such exposure can cause serious mental health injuries, such as Post Traumatic Stress Disorder (PTSD), a condition that is associated with an estimated 13% of recently graduated Canadian nurses who intend to leave the nursing profession.

This research explored why newly graduated RNs leave the profession. The ultimate goal is to identify resiliency solutions and strategies that can be embedded in undergraduate nursing education to help ensure that the incoming generation of Manitoban nurses is well-prepared for the broadest range of workplace challenges and traumatic stress-inducing encounters within nursing practice.

**Despite efforts to address the Registered Nurse (RN) shortage, the Canadian Nurses Association predicts an estimated shortfall of 60,000 RNs by the year 2022.**

Participants in the study were newly-graduated RNs who had practiced in British Columbia, Alberta, and Manitoba and who were taking steps to leave the nursing profession within five years of entry-to-practice. Key findings indicated newly graduated nurses require a variety of supports (workplace orientation reasonable patient-nurse ratios, respectful inter-professional teamwork, authentic and understanding managers) establish a nursing identity and remain in the profession. Also vital was constructive feedback and emotional support in the face of traumatic experiences and a sense of being welcomed, valued, respected and accepted into the workplace environment. As many as 75-85% of nurses experienced bullying, humiliation, blame, and criticism. The process of exiting the nursing profession

began during undergraduate nursing education and peaked within two-to-five years of professional practice resulting in permanently leaving the nursing profession to pursue careers that included law, education, midwifery, research, accounting, and global health.

A sustainable nursing workforce cannot exist without the bedrock of interpersonal support fostered through nursing education, health care policy, and workplace culture. The adoption and utilization of strategies to mitigate compassion fatigue and traumatic stress and to promote healthy coping mechanisms in undergraduate nursing programs may interrupt or prevent an exodus of nurses from the nursing workforce.



# Power-Sharing and External Governance of Self-Determination Disputes

DR. ALLISON MCCULLOCH, DR. JOANNE MCEVOY (UNIVERSITY OF ABERDEEN)

As the world witnesses an increasing number of armed conflicts, international actors continue to grapple with the question of how to end war and build peace in deeply divided, war-torn territories. In conflict zones around the world, mediators increasingly recommend power-sharing pacts whereby ethnic representatives agree to end the violence and govern the country together. Despite its popularity, power-sharing can be unstable. While it has proven effective in the short to medium term, over time it is prone to destabilizing political crises arising from the legacy of the conflict.

This project adopts a multi-methods approach. Case studies will focus on three conflict mediating organizations and will include interviews with conflict mediators as well as content analysis

of mediation documents, the memoirs of negotiators, and peace agreements.

The findings from this project will contribute to the ongoing debates on power-sharing, conflict mediation, and external governance arrangements. Mediators will benefit from the focus on the rationale for adopting power-sharing arrangements. The findings can also be used by policymakers, community organizations and political parties in conflict and post-conflict zones dedicated to peace, as well as by the general public. As citizens become more knowledgeable about power-sharing practices they can use this information to encourage their political elites to negotiate settlements that ensure locally-driven peacebuilding and power-sharing practices.

## News Coverage of Police Body Cameras

DR. CHRISTOPHER SCHNEIDER

Most people learn about policing from exposure to media, rather than from direct experience, including learning about body camera: small audio and video recording devices worn on police uniforms. Research is growing, but little is known about the benefits and drawbacks of body cameras.

This project examined media coverage of the 2015 “Rialto study.” The study, prepared by William A. Farrar, a graduate student at the University of Cambridge and the Chief of the Rialto, California Police Department at the time, was the first peer-reviewed controlled experiment on the effect of body cameras on police use of force. Among offices in Rialto who wore body cameras, use of force incidents decreased, as did citizen complaints.

Analysis of media coverage showed that following initial national exposure, reporting of Farrar’s direct role shifted away over time from his involvement as a researcher. The findings seem to suggest that media guidelines are oriented to the police legitimization process itself.

These findings illuminate a trend in evidence-based policing that includes a move toward police-academic partnerships. This research might be useful in helping to develop conflict of interest policies in relation to media coverage of academic research when produced as official police knowledge by police insiders. Increased transparency could help reduce public perceptions of police bias and/or influence over findings, thereby contributing to increased police legitimacy.

## Canada’s Emergency Legislation

JACK LINDSAY

We often hear about a local government declaring a ‘state of emergency,’ but many people do not really know what that means. In Canada, there is different legislation in every province that empowers local authorities and the provincial government to declare a state of emergency. There is also the Emergencies Act that allows the federal government to declare a national emergency. These acts set out extraordinary powers that can be exercised during a declared emergency, essentially suspending many of the rights and freedoms we enjoy as Canadian citizens.

A review of the existing literature quickly showed a gap as no one had considered how emergency powers were assigned across Canada or looked at where they originated. Even though every

province has its own history of how its emergency management legislation was developed, there are some commonalities. Most of the provincial emergency laws were first drafted in the 1950s with the threat of nuclear war being more of a concern than natural disasters like tornadoes or floods. Under a state of emergency, many of the rights Canadians enjoy become more closely controlled. Creating and using these powers is a significant part of ensuring public safety; therefore elected officials must be sure the appropriate planning and preparation have been undertaken. This research can help elected officials and emergency managers recognize the responsibilities that come with declaring a state of emergency and exercising the powers granted by Canadian law.

# Water, Nutrients and Management Decisions

BRANDICE HOLLIER, DR. PETE WHITTINGTON, AND DR. CHRISTOPHER MALCOLM

Wetlands are a vital part of many ecosystems, offering flood protection, water filtration, and habitat for many aquatic species. Because wetland vegetation is effective at taking up excess nutrients, it is becoming more common to use wetlands as discharge points for treated wastewater effluent (i.e., from a sewage lagoon) to attenuate any nutrients before they make their way to a river or lake. The town of Wasagaming, in Riding Mountain National Park, is an example, with treated wastewater effluent discharged from a sewage lagoon into Ominnik Marsh and then to South Lake via a constructed channel, before flowing into Clear Lake through a sand barrier bar. However, in the original flow path, Octopus Creek skirted Ominnik Marsh and flowed directly north into Clear Lake.

Parks Canada's mandate is to manage for ecological integrity, which includes restoration of human-altered systems to their natural conditions. In this case, restoration means realigning the original flow path of Octopus Creek. The question is: should they? There exists a quagmire between restoring the original flow path and potentially harming Clear Lake, or not restoring, which arguably disregards Parks Canada's mandate. Fortunately, through established hydrological and water

chemistry techniques, an informed recommendation can be made to Parks Canada. Stream gauging and water samples are being used to determine the quantity and quality of surface water flowing into and out of Ominnik Marsh and South Lake. Data loggers installed at each of the study sites monitor the water level, providing a continuous record. Piezometers installed in the ground at different depths determine groundwater fluxes, and meteorological conditions (precipitation, evaporation) are measured at a nearby Environment Canada weather station. Understanding the water chemistry at different points in the system is important in determining if the hydraulic retention time of Octopus Creek is long enough to filter out potential excess nutrients before the water enters Clear Lake.

Preliminary results show that the amount of surface water reaching South Lake through the human-constructed channel is minimal; therefore, diverting the water to Clear Lake through Octopus Creek would likely have minimal impacts on South Lake. Results also show that surface water nutrient levels within the system are low, and that there is likely no concern if the original Octopus Creek flow path were to be reconstructed.

# A Light Approach to Gravity

DR. JEFF WILLIAMS

Recently, researchers have proposed new ways of presenting Einstein's theory of gravity, the theory of general relativity, in hope of gaining a fresh perspective on longstanding problems, such as how to merge general relativity with quantum theory. One of these approaches is called the null-surface formulation of general relativity, which considers the surfaces that are defined by light trajectories running alongside each other.

As a boy, Einstein wondered how the world would look if he could travel on a beam of light. Much later, he found the answer: It would look as if time was standing still. Nothing happens. Hence the term 'null surface.' The event horizons of black holes are important examples of null surfaces and provide a link between gravity and the rest of physics.

The fundamental equations of the null-surface formulation of general relativity are complicated, hiding hundreds of valid solutions. Each solution describes a galaxy or a star or universe, which may or may not correspond to any of the galaxies or

stars we know or to the universe around us. This project began a search for solutions in a pretend world of only two space dimensions and, of course, one dimension of time: 2+1. (The real world of 3+1 dimensions was far too daunting.) Physicists and mathematicians delight in choosing Greek letters to name their most cryptic concepts, and we were seeking a function named  $\Lambda$  (lambda). We knew there would be hundreds of different  $\Lambda$ s. For simplicity, we assumed that  $\Lambda$  depended upon a single spacetime variable. Picture it as a variable that runs along Einstein's light beam and call the variable 'r.'

We found  $\Lambda = \sqrt{(r^2 + r + 1)^3}$ , the first solution anyone has found. This solution describes a make-believe universe that contains matter and is rotating like a gigantic whirlpool. Recently, we discovered a second solution, vastly more complicated than the first. This solution describes a universe that is expanding, like our own, and has an all-pervading scalar field, like our own. This latest universe is still in 2+1 dimensions, but its structure suggests a way to extend the framework into 3+1 dimensions.

## Rural Perceptions of Intimate Partner Violence

MEGHAN WRATHALL, GRADUATE STUDENT

The purpose of this research was to examine rural perceptions of intimate partner violence, and how these perceptions have been constructed. Rural regional service centres in Brandon, Manitoba, and Sydney, Nova Scotia, were selected to examine the community perceptions of intimate partner violence through semi-structured interviews of service providers. The similarities and differences among the case studies illustrate how rurality and cultural variations embedded in place significantly influence the perceptions towards intimate partner violence, and subsequently the rates and maintenance of intimate partner violence.

Intimate partner violence is more prevalent and chronic in rural areas in Canada with several factors specific to rurality that help maintain it. For example, geographic barriers, such as distance to services, weather, and lack of transportation are commonly cited.

The four key findings emerging were the use of othering, victim blaming, normalizing the violence, and creating a public/private divide where intimate partner violence was a private family issue. These four themes reinforce two broader processes of minimizing and marginalizing the problem of intimate partner violence, creating a hazardous environment for victims. Secondly, it was found that constructions of rurality itself help to sustain such perceptions. Service providers in Brandon and Sydney named patriarchal systems as a leading force constructing community perceptions, through traditional gender roles and family structures.

## Mental Health Nurses' Experiences of Chemical Restraints

MICHELLE DANDA, GRADUATE STUDENT

When a patient's behaviour is out of control, posing a risk to the patient and those around them, three types of restraints may be used: physical, like holding or restraints, environmental, such as locked rooms, and chemical, rapidly acting sedatives. Relatively little is known about nurses' experiences of administering chemical restraint.

Six themes emerged from the data analysis: using all the tools in the toolbox, taking control to maintain safety, using therapeutic intervention, working within constraints, making medication choices, and transitioning from novice to expert.

Findings in this study provided new insight into the experiences of acute mental health nurses' practices of administering chemical restraints and highlighted gaps in consistent terminology and nursing knowledge. For example, there were many ambiguous terms used to describe nurses' reasons for using chemical restraint, and varying terminology of the practice itself. Nursing use of chemical restraint was a complex process. Participants shared their experiences of using psychotropic medication regularly in their day-to-day mental health nursing practice. The six themes that were mentioned above emerged in the data analysis process and uncovered the significance of the practice, while highlighting nurses' knowledge gaps. Research findings indicated a need for further inquiry into the specifics of the decision-making process of nurses in making the choice to use chemical restraint medication, the time to use this medication, and the type of medication to use.

## Making Inclusion Work for Young People in Manitoba: Developing a Flourishing Framework for the Education of Marginalized Offenders

EBENEZER DUNCAN-WILLIAMS, GRADUATE STUDENT

This research explored the development of an inclusive education framework that would include youth who were marginalized due to their involvement in or risk of involvement with the criminal justice system.

The young people in this target group are struggling with homelessness, poverty, unemployment, and low educational attainment rates. It is crucial to use the poor life and inadequate educational outcomes of the young people as catalysts to develop an inclusive education framework that enables these young people to flourish. From an educator's perspective, an effective inclusive education framework must include four main

ideas: (1) interpersonal qualities: relationship, respect, trust, authenticity, advocacy, and self-esteem, (2) emotional capacities: love, compassion, empathy, belonging, and caring, (3) enabling pedagogies: critical pedagogy and assessment, and (4) intended outcome: flourishing.

The findings suggest that teachers need to focus on developing deep, personalized relationships with students and they need to understand that the task is about facilitating the opportunities for individual students to flourish, rather than about assisting those students to meet a prescribed set of achievements.



## Impacts of Smooth Brome on Insect Diversity

VANESSA ROSENKRANZ, GRADUATE STUDENT

Fescue grasslands are increasingly rare yet diverse ecosystems that provide habitat for many bird species. They are threatened by smooth brome, an aggressive exotic grass that effectively outcompetes native plant species.

Part of our research compared both plant diversity and insect diversity to smooth brome cover in order to determine the management priorities for this invasive species. Our research also provides data for predicting grassland recovery and for identifying gaps in species composition.

In the studies relating smooth brome presence to vegetation cover of other species, strong negative correlations were found for six of nine of the most common plant species: As brome cover increased, the native flora thinned. Examination of the seed bank revealed that fewer seedlings were recovered from soils with greater smooth brome cover. Smooth brome was not found in this seed bank study, but Kentucky blue grass was dominant. However, there were also 14 native herb and grass species present in the seed bank. In addition to seeds, grasslands may also recover from encroaching roots and rhizomes from the surrounding area. A negative correlation was found between smooth brome cover and arthropod abundance, especially for flies and leafhoppers. The leafhopper and grasshopper groups were further divided into species. A few leafhopper species showed a negative association with smooth brome. Biomass and species richness of these species also had negative relationships with smooth brome. However, no negative relationships were found between smooth brome and the fauna groups that provide nesting bird diet, such as grasshoppers, beetles, moths and butterflies, and spiders. This is great news for the birds because the smooth brome infestation does not remove their food.

The current plant and insect diversity studies emphasize the need to control smooth brome to prevent species loss in protected areas. However, food resources for birds do not seem to be negatively affected by smooth brome. This data helps determine the priority of managing smooth brome. In addition, seed bank data can be used for remediation planning such as appropriate seed mixes. Overall, ecological data, such as insect abundances and diversity, strengthen the knowledge base for the larger scientific community.

## Internet Culture and Music

LUIS RAMIREZ, GRADUATE STUDENT

As the Internet continues to be an integral component of our lives, there are certain elements and trends in our online interactions that slowly converge into cyberculture. My goal as a composer was to take these elements of our virtual world and incorporate them into a traditional chamber music setting. This juxtaposition of cultures leads the way to new discussions about the future of music and the impact of technology in our lives. The general goal with the compositions of this recital was to invite the audience to reflect on how some aspects of our lives can be or have been influenced by the internet.

I began by looking into online phenomena that I considered interesting and surprisingly common online but are not often discussed in the real world. In each of my works, I focused on one specific element of cyberculture: live streaming with “The Internet,” advertising bombardment with “Adagio Detestabile,” information overload with “Infocination,” vloggers with “My First Vlog,” clickbait with “THE MOST BEAUTIFUL MUSIC YOU’VE EVER HEARD,” adult webcams with “Coquette,” phone addiction with “Amigos,” and detachment from reality with “kthxbye.” I approached these topics with several musical and conceptual tools. For example, in “Amigos” I wanted to emulate a person’s obsession with their phone during social gatherings. To reflect a social gathering in the music, I used a stereotypical chamber music setting, which is in itself a conversation amongst the instruments. The first section of the music evokes a sense of friendship or having a good time. However, during the last section of the piece, the performers are asked to take out their phones and stare at them while they continue playing with the other hand. The music transitions into a darker and bleaker atmosphere, and the appearance and physicality of the performers are equally affected, depicting a hunched posture and gravitating closer and closer towards the phone. I intended to leave a strong impression on the audience, and the sharp contrast between sections provided a very effective result.

I was overwhelmed with positive feedback from the audience members. Some shared personal stories about related situations; others described how a specific composition triggered a better understanding of younger generations. I am deeply interested in the use of the Internet as a medium for community creation and the impact this may have on musical culture. This area of research is rich in potential and crucial for understanding the evolving landscape of music-making. The Internet is changing the way people make and discover music together, and I believe the research that is geared toward this evolution is imperative.

## External and Internal Research Funding

Brandon University researchers received more than \$3.2 million in external research funding for the 2017-18 year. The Brandon University Research Committee (BURC), through its annual competition, allocated nearly \$118,000 more to BU researchers. New researchers may apply for up to \$7,500 and experienced researchers up to \$4,000. These funds are intended as seed money to develop research for larger national grant applications.

The following tables identify the research funding received by Brandon University faculty members in the 2017-18 year. Tri-agency grants are highly competitive grants received from three funding agencies: Canadian Institute of Health Research (CIHR), Natural Sciences and Engineering Research Council (NSERC), and Social Sciences and Humanities Research Council of Canada (SSHRC). Other granting agencies include the Canada Foundation for Innovation (CFI), Canada Research Chairs (CRC), Research Support Fund (RSF), Government of Canada, Manitoba Provincial Government, industry and others.

### EXTERNAL RESEARCH FUNDING 2017-2018

#### Canadian Institutes of Health Research (CIHR)

Total \$132,522

Researcher	Faculty/School	Grant	Title	# Years	\$ Awarded
Penny Tryphonopoulos	Health Studies	Project (Sub Grant - University of Calgary)	Video-Feedback Interaction Guidance for Improving Interactions Between Depressed Mothers and their Infants	2	\$57,522
Rachel Herron	Science	Operating (Sub Grant - Trent University)	Social Inclusion of Individuals with Dementia and Carers	3	\$75,000

#### Natural Sciences and Engineering Research Council of Canada (NSERC)

Total \$365,283

Chenkuan Li	Science	Discovery Development	Fractional Calculus of Distributions and Integral Equations	2	\$20,000
Margaret Carrington	Science	Discovery	Non-perturbative and out-of-equilibrium field theories	5	\$200,000
Mousumi Majumder	Science	Discovery	Molecular Determinants of Vertebrate Vasculature and Development	5	\$130,000
Nancy Stanley	Education	PromoScience Supplement	Science Literacy	1	\$5,000
Nancy Stanley	Education	PromoScience Supplement	Science Odyssey	1	\$5,000
Paul Alexandre	Science	Connect	Discussion with Plateau Uranium and Cameco Corporation	1	\$3,550
Peter Whittington	Science	NSERC Collaborative Research & Development (sub grant - University of Laval)	Farm, Restore, and Model: Responsible Management of Peatlands for a Sustainable Canadian Horticultural Peat Industry	1	\$1,733

#### Social Sciences and Humanities Research Council of Canada (SSHRC)

Total \$24,801

Brandon University	n/a	Institutional	SSHRC IG	1	\$14,801
Peter Morin	Arts	Insight (Sub Grant - University of British Columbia Okanagan)	Crossing Media, Crossing Canada: Performing the Land We Are	1	\$10,000

**Canada Foundation For Innovation (CFI)****Total \$426,337**

Researcher	Faculty/School	Grant	Title	# Years	\$ Awarded
Brandon University	n/a	Infrastructure Operating Fund	Operations and Maintenance of CFI-funded Infrastructures	1	\$26,748
Bryan Cassone	Science	John R. Evans Leaders Fund	From Genes to Phenotype in MB Health, Disease and Biodiversity	1	\$297,569
Rachel Herron	Science	John R. Evans Leaders Fund	Rural and Remote Mental Health Laboratory	1	\$35,725
Sarah Plosker	Science	John R. Evans Leaders Fund	Quantum Computing Research Laboratory	1	\$66,295

**Canada Foundation For Innovation (CFI)****Total \$500,000**

Sarah Plosker	Science	CRC Tier II	Canada Research Chair in Quantum Information Theory	5	\$ 500,000
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**Research Support Fund (RSF)****Total \$305,276**

Brandon University	n/a	Research Support Fund	Research Support Fund	1	\$305,276
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**Canada Foundation For Innovation (CFI)****Total \$418,367**

Bill Ashton	Arts	Indigenous Affairs	Indigenous Economy Contributions to MB	2	\$76,000
David Greenwood	Science	Northern Scientific Training Program	NSTP 2017 (Student Award)	1	\$2,100
Karen Rempel	Education	New Paths for Education	Success Through Our Eyes - Photo voice Project	1	\$85,840
Karen Rempel	Education	New Paths for Education	Action Research for Mino-Pimaatisiwin in Erickson MB Schools	1	\$249,427
Pamela Rutherford	Science	Environment Canada	Plains Hog-Nosed Snake Status Report	1	\$5,000

**Manitoba****Total \$751,831**

Bill Ashton	Arts	Elections Manitoba Contract	Electoral Divisions Boundaries Commission Report	1	\$2,000
Bill Ashton	Arts	Indigenous and Northern Relations	Indigenous Economy Contributions to Manitoba	1	\$24,473
Brandon University	Institutional	Research Manitoba Health Research Initiative	Health Research Initiative	1	\$12,633
Bryan Cassone	Science	Research Manitoba CFI Matching Funds	From Genes to Phenotype in MB Health, Disease and Biodiversity	1	\$297,569
Bryan Cassone	Science	MB Health (contract)	West Nile Virus Program	1	\$23,953
Not yet public		Research Manitoba CFI Matching Funds		1	\$297,569
Deanna Smid	Arts	Research Manitoba Research Connection	The Northern Plains Conference on Early British Literature 2018	1	\$3,500
Kathryn Chachula	Health Studies	Workers Compensation Board of MB	Perceptions and Experiences of Trauma within Undergraduate Nursing Education	2	\$54,409
Not yet public		Research Manitoba CFI Matching Funds		1	\$35,725

**Industry and Other Agencies****Total \$317,707**

Bill Ashton	Arts	WOLG Contract	Soybean Processing Plant Initiative	2	\$115,419
Bill Ashton	Arts	Federation of Canadian Municipalities	Rural Canada Data	1	\$14,000
Lynn Whidden	Education	Butler Foundation	Metis History in Song: Paris to the Plains! The Singing Tracks	1	\$538
Nancy Stanley	Education	Actua	CanCode - Mini U	2	\$95,000
Pamela Rutherford	Science	MB Habitat Heritage Corp	Minota Garter Snakes - Monitoring Post-Seismic Activity	1	\$1,000
Pamela Rutherford	Science	Nature Conservancy of Canada	Surveys for Rare and Uncommon Herptile Species	1	\$3,000
Paul Alexandre	Science	Mitacs Accelerate	The Role of the Host Rock in the Formation of the Rice Lake Gold Deposits...	2	\$30,000
Paul Alexandre	Science	Klondex Mines Ltd Contract	Relationship between Host Rock Lithology and Gold Potential	2	\$57,500
Pete Whittington	Science	Louisiana Pacific	Louisiana Pacific Research Project	1	\$1,250

**TOTAL EXTERNAL FUNDING \$3,242,124**



# Internal Research Awards 2017-18

## BRANDON UNIVERSITY RESEARCH COMMITTEE (BURC) AWARDS

Principal Investigator	Title	Award Total
New Faculty Research Grant		
Alex Koiter	The Influence of Agriculture and the Manitoba Escarpment on sediment Dynamics	\$7,310
Alysha Farrell	A Dramatic Inquiry into Expressions of Curated Intimacies on Social Media	\$7,407
Breanna Lawrence	Understanding the Interrelation of Learning Disabilities and Youth Mental Health in Relational Contexts: Exploring Family Influences and Eliciting Parent Voices	\$6,600
Cameron Boulton	Intellectually Responsible Democracy	\$7,073
Candy Skyhar	Developing Teacher Identity in Tomorrow's Teachers	\$4,407
Chris Pugh	Spatial Photon Correlations for Satellite Targeting	\$7,500
Eftihia Mihelakis	"Convergences. Les Séminaires d'Hélène Cixous au Québec (1973-1985)" Convergences. Helene Cixous' Seminars in Quebec (1973-1985)	\$7,500
Joel Krentz	The Effects of Conventional Versus Eccentrically Emphasized Resistance Training on Muscle Thickness, Strength and Functional Performance in Older Adults: A Randomized Controlled Study	\$7,487
Matthew Steckler	Prairie Machinations - A New Musical Work of Embodied Composition for Improvisers	\$5,150
Patricia Douglas	Disability Studies, Inclusion and Education: A Program Review	\$6,725
Scott Forbes	The Effect of Creatine Timing on Resistance Training Adaptations. A within Subject Design.	\$7,500
Shahla Nasserassr	Inverse Eigenvalue Problem, Totally Positive Matrices	\$7,500
Tim Skuce	An Inquiry into the Lived Experiences of the NHL's Ambassadors' Participation in Community Outreach Events and their Day-to-Day Interactions with their Teammates as they Strive to Cultivate a More Inclusive Environment...	\$4,000

Research Grant		
Bruce Strang	Seeking Victory: Mussolini, Italian Foreign Policy and the Anglo-Italian Easter Accords, 1937-8	\$4,000
David Greenwood	Insect Leaf Feeding During a Past Climate Warming in the McAbee Fossil Site	\$2,354
Emma Varley	Medicine as a Great Game: British Colonial Hospitals and their Postcolonial After-Effects in Northern Pakistan	\$3,972
James Naylor	Winnipeg's Folklorama: Multiculturalism and the Remaking of Ethnicity	\$2,354
Jonathan Allan	Medical Advice in Men's Magazines	\$2,354
Mary Malainey	Establishing the Chronology of the Good site (DjMb-16)	\$4,000
Nancy Newall	Social Isolation of Older Adults and Emergency Medical Services	\$2,354
Sarah Plosker	Quantum Random Walks	\$2,354
Tyler Foster	Picture This: Computing our Way to an Image of our Home Galaxy, The Milky Way	\$4,000
Vince Chen	Development and Testing of Preclinical Therapeutic Agents to Inhibit Glioma	\$4,000
Total:		\$117,908

## About Research Connection

These Brandon University research summaries and research features are based on Research Connection, a periodical publication intended to provide information about the impact of Brandon University's academic research, creative activities and expertise. Research Connection highlights BU research using a regular structure:

- *What you need to know*
- *Why this research is important*
- *How this research was conducted*
- *What the researcher found*
- *How this research can be used*
- *About the researcher*

The structure of Research Connection is adapted with permission from the ResearchSnapshot clear language format used by ResearchImpact-RéseauImpactRecherche (researchimpact.ca). Research Connection is supported by the Office of Research Services and by the Centre for Aboriginal and Rural Education Studies, Faculty of Education.

Many of the summaries presented in this booklet represent ongoing research, and there are always new findings to report. Find more online at [BrandonU.ca/Research-Connection](http://BrandonU.ca/Research-Connection)

## Research ethics at Brandon University

Brandon University is committed to maintain the highest standards of research ethics for all research activities involving animals, human participants and the secondary use of identifiable information.

For research activities involving animals, the Brandon University Animal Care Committee (BUACC) follows the guidelines of the Canadian Council on Animal Care (CCAC). These guidelines require that all teaching, research and demonstrations involving animals, receive prior approval of the BUACC before being implemented.

For human research projects, the Brandon University Research Ethics Committee (BUREC) follows the guidelines of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2 – 2014). These guidelines require that BUREC review and approve any research involving humans or the use of identifiable personal information before any data collection can begin.

In addition to these guidelines, Brandon University's institutional policies include the Brandon University Policy on Research Involving Humans (2018), the Brandon University Research Ethics Committee (BUREC) Policies & Procedures and the BUREC Non-Compliance Policy and Procedures.



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